

THE CAMBRIDGE ECONOMIC HISTORY OF AUSTRALIA

Australia's economic history is the story of the transformation of an indigenous economy and a small convict settlement into a nation of nearly 23 million people with advanced economic, social and political structures. It is a history of vast lands with rich, exploitable resources, of adversity in war and depression, and prosperity and nation building. It is also a history of human behaviour and the institutions created to harness and govern human endeavour.

The Cambridge Economic History of Australia provides a systematic and comprehensive treatment of the nation's economic foundations, growth, resilience and future prospects, in an engaging contemporary narrative. It examines key themes such as the centrality of land and its usage, the role of migrant human capital, the tension between development and the environment, and Australia's interaction with the international economy.

Written by a team of eminent economic historians, *The Cambridge Economic History of Australia* is the definitive study of Australia's economic past and present.

SIMON VILLE is Professor of Economic and Business History and Head of the School of Humanities and Social Inquiry in the Faculty of Law, Humanities and the Arts at the University of Wollongong.

GLENN WITHERS is Professor of Economics in the Arndt-Corden Economics Department, Crawford School of Public Policy, and Visiting Fellow in the Regulatory Institutions Network at the Australian National University.

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HISTORY OF AUSTRALIA

Edited by
SIMON VILLE
and
GLENN WITHERS



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Preface

The project to write the first Cambridge Economic History of Australia commenced early in 2012. It drew some of its inspiration from Simon Ville's involvement in the recently published *Cambridge History of Australia* (edited by Alison Bashford and Stuart Macintyre). This new work and its brief treatment of economic history pointed to the need for a separate study. Equally, Glenn Withers' involvement in government policy development highlighted the distinctive value of an enhanced understanding of Australian economic history.

A quarter of a century has passed since the last comprehensive economic history of Australia was written by an expert group: economic history has undergone many changes in Australia and overseas since Maddock and McLean's *The Australian Economy in the Long Run*. Consistent with the outward-looking nature of economic history today, the editors have enlisted a wide-ranging group of authors drawn from Australia and overseas in economic history and closely related disciplines. Each author brings to the project a thorough expertise in their topic drawn from years of high-quality academic research output complemented, in several cases, by relevant practitioner experience in government or business. As ever, the editors have sought a fine balance between a consistent party line of what should be included and how it should be argued, with the spirit of allowing authors to impart some personal flavour and individual interpretation of their material. Allowing some author latitude has been vital to accommodate a range of perspectives, viewpoints and approaches. No account of a large national story will ever be entirely comprehensive; rather our aim is to make it authoritative, thought-provoking and relevant to the 21st century.

In addition to ongoing email conversations between the editors and the contributing authors, and indeed among the authors themselves, the group came together for two symposiums. In the first of these, hosted by the Centre for Economic History at the Australian National University in July 2012, the framework and parameters of the project were discussed and chapter synopses workshopped. At the second workshop, hosted by Trinity

College Melbourne in February 2013, full draft chapters were workshopped, with each session led by a discussant and followed by a broad evaluation of each paper by the group as a whole. Following the meeting, all authors were provided with written feedback from the editors to assist in revising chapter drafts. Finally, selected chapters were sent out to external referees and feedback from Cambridge University Press was also received.

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Simon Ville
Glenn Withers

Abbreviations

ABS	Australian Bureau of Statistics
ACCC	Australian Competition and Consumer Commission
ACCI	Australian Chamber of Commerce and Industry
ACOSS	Australian Council of Social Services
ACTU	Australian Council of Trade Unions
AIRC	Australian Industrial Relations Commission
AIS	Australian Iron and Steel
AMP	Australian Mutual Provident Society
ANU	Australian National University
ANZ	Australia and New Zealand Bank
ANZSIC	Australian and New Zealand Standard Industrial Classification
APEC	Asia-Pacific Economic Cooperation
APRA	Australian Prudential Regulation Authority
ASEAN	Association of South East Asian Nations
ASIC	Australian Securities and Investment Commission
ATM	automated teller machine
AUD	Australian dollar
AUSAT	Australian Satellite Users Association
AWA	Amalgamated Wireless Australia
AWC	Australian Wool Corporation
AWOTE	average weekly ordinary time earnings
BCA	Business Council of Australia
BHP	Broken Hill Proprietary Company Limited
BIE	Bureau of Industry Economics
CBCS	Commonwealth Bureau of Census and Statistics
CER	Closer Economic Relations (agreement)
cm	centimetres
CPI	consumer price index
CSL	Commonwealth Serum Laboratories Limited

Abbreviations

CSR	Colonial Sugar Refining Company
DFAT	Department of Foreign Affairs and Trade
DIISR	Department of Innovation, Industry, Science and Research
EAEC	Eurasian Economic Community
EDP	Electronic Data Processing
EFTPOS	electronic funds transfer at point of sale
FAO	Food and Agriculture Organization (United Nations)
FCAI	Federated Chamber of Automobile Industries
FDI	foreign direct investment
FIRB	Foreign Investment Review Board
G20	Group of Twenty (Group of Twenty Finance Ministers and Central Bank Governors)
GATT	General Agreement on Tariffs and Trade
GDP	gross domestic product
GFC	global financial crisis of 2007–08
GIO	Government Insurance Office
GNE	gross national expenditure
GPS	global positioning system
GST	goods and services tax
GVA	gross value added
HDI	Human Development Index (United Nations)
HILDA	Household, Income and Labour Dynamics in Australia (survey)
IAC	Industries Assistance Commission
ICIANZ	Imperial Chemical Industries of Australia and New Zealand
ICT	information and communications technology
IMF	International Monetary Fund
km	kilometre
km ²	square kilometres
LSE	London School of Economics
m	million
n/a	not applicable or not available
NABALCO	North Australian Bauxite and Alumina Company
NATSEM	National Centre for Social and Economic Modelling
NBFIs	non-bank financial institutions
NEC	not elsewhere classified
NRA	net rate of assistance
OECD	Organisation for Economic Co-Operation and Development
OTC	Overseas Telecommunications Commission
p.a.	per annum

Abbreviations

PMG	Postmaster-General (Department)
PMVs	passenger motor vehicles
R&D	research and development
RBA	Reserve Bank of Australia
RRA	relative rate of assistance
RTZ	Rio Tinto–Zinc Corporation
SAIs	Statistical Areas Level 1
SCRGSP	Steering Committee for the Review of Government Service Provision
SRWSC	State Rivers and Water Supply Commission
TAA	Trans Australia Airlines
TCF	textiles, clothing and footwear
TDC	Trade Development Council
TFP	total factor productivity
TNT	Thomas Nationwide Transport
ToT	terms of trade
TPA	<i>Trade Practices Act 1974</i>
TRI	trade restrictiveness index
TRIMs	Trade-Related Investment Measures
TWI	trade-weighted index
USD	United States dollar
VDL	Van Diemen's Land
WCIC	Water Conservation and Irrigation Commission
WEA	Workers' Educational Association
WHO	World Health Organisation
WTO	World Trade Organization

Introduction: connecting past, present and future

SIMON VILLE AND GLENN WITHERS

Australia's economic history is a remarkable story and one worth telling: the transformation in a little over two centuries of a largely subsistent indigenous economy and a small, initially impoverished, convict settlement to a nation of nearly 23 million people with advanced economic, social and political structures and among the highest standards of living in the world. It is the history of vast lands with rich exploitable resources, cyclical shocks and changes, and the new peopling of a continent to build a modern economy of workers and consumers. It is the history of business, community and government, of the interactions of private and public sectors. It is about nation building through the creation of major infrastructure, but also through leveraging the benefits of international economic linkages. It is also about tackling adversity – economic depressions in the 1840s, 1890s and 1930s and military conflict in 1914–18 and 1939–45. At the same time it is about building prosperity – in the 1860s to the 1880s, from 1945 to the 1970s, and most recently and quite spectacularly from the 1990s to the present. It is the recognition of some of the costs of that economic growth, particularly the severe impact on the prior Indigenous (i.e. Aboriginal and Torres Strait Islander) population and on the environment, and how to redress those impacts. Finally, like all good history, Australia's tale is about human volition and behaviour and the institutions that are created to harness and govern that human endeavour – for our purposes, specifically how this has worked out in 'Terra Australis Incognita' through its economy. The history of Australian development, thus, has resonance for the country's own sense of itself. It also has interest for others, both as part of the global human story and for its distinctive insights.

Australia's economic history has of course been written by previous generations, among them Coghlan, Shann, Fitzpatrick, Sinclair, Boehm, Schedvin and the Butlins, as Coleman explains in Chapter 1 of this volume. Nevertheless, this is a good time to rewrite our economic history.

Australia stands at a crossroads in its economic development. In the recent past, a long secular boom unfolded in the early 1990s, with Australia experiencing one of the most sustained eras of economic prosperity of any country and regaining some of the ground it had lost compared with the economic development of other nations during the 20th century. The boom was fleetingly challenged by the global financial crisis of 2007–08, an event that pounded heavily upon many of the major economies of the world. The strength of Australia's progress in the former and resilience through the latter are noteworthy. Casting forwards, Australia has set foot in the Asian century, during which it is anticipated that Asian nations, especially China, will dominate economic and political development. Given the geographic proximity and trade complementarity with this emerging locus of global power, and the cultural and political differences between our spheres, Australia faces a specific set of challenges. If the recent past resonates with resilience, the near future exposes potential frailties. Of course, Australia also shares many of the global challenges of the developed world – climate change, ageing populations, shifting notions of health, education and wellbeing, new phases of the technology revolution, reconfiguring of the family, religion and society, and restructuring of the workplace and working life – all of which are relevant for our economic progress in the 21st century.

In seeking to interpret our current conditions and anticipate our future prospects, we can draw conscious inspiration from history. Learning the lessons of prior experiences, understanding how, through path dependency, the past shapes our current position, and using this broad knowledge to appreciate when and how change will occur are all part of the educational toolkit provided through studying history. This book will help to demonstrate those connections between past, present and future.

Scholars are not the only group of writers keen to examine the past and use it as a predictive lens. Recently, a series of books written by journalists, public servants, business leaders, and campaigners have looked at the nexus between our history and our future prospects (see Ritter & Panegyres 2013). All of the books are concerned about the frailties of our future. Designed to attract the attention of a large audience, these books, while good reads, mostly polarise between the triumphalist or the doomsayer mentality, galvanising supportive elements of our history to promote a cause. We are reminded of the old adage of never allowing the facts to get in the way of a good story. Those most inclined to boast about our past, particularly the resilience of our policy measures, overlook the mistakes and poor judgments along the way. For the doomsayers, by contrast, a clever country is replaced

by the lucky one and history is a story of fortuitous events combined with missed opportunities or human failures that have built up severe environmental, social and demographic challenges.

Part of the reason for this selective ‘hijacking’ of history, though, may lie with the academic profession’s failure to keep our economic history fresh, accessible and up to date or, at least, to prevent the space of public intellectuals from being occupied by those with specific advocacy agendas. It is rare that we see an economic historian featured in the media, providing context and perspective. However, economic history itself in Australia has changed in the quarter-century since the last major study of national economic development.

At the time of *The Australian Economy in the Long Run* (1987), edited by Maddock and McLean, economic history was a very different discipline. It existed in small separate departments and taught far more students than it does today. There is a sense of institutional decline over the intervening period, with economic history departments merged into larger entities and enrolments squeezed by the loss of core subjects, displaced by more seemingly functionalist subjects. Yet the discipline has blossomed in other ways. Its main content, structures and activities have flourished over the last few decades. The Economic History Society of Australia and New Zealand has now passed its half-century, and its journal, the *Australian Economic History Review*, now includes more international content, Asian board members and an Asia-Pacific subtitle. It is now listed in key citation indexes and has been highly ranked in national and international journal lists. The society’s annual international conference, named the Asia Pacific Economic and Business History Conference since 2005, has replaced its largely national gatherings of earlier years. In many ways, economic history in Australia has achieved a sense of maturity, engaging with broader communities at home and overseas, and developing a distinctive version of the discipline that sits somewhere between North American emphasis on applied economics and econometrics and the European tradition of narrative history, as Coleman explains in Chapter 1.

As we have been reminded many times, each generation rewrites history in the light of its own experiences. It is in this sense, therefore, that the current volume has been written in a spirit that is outward-looking and inclusive, drawing on insights across disciplinary boundaries and setting Australia’s historical experience in a broad comparative context. This greater sense of engagement is producing its due rewards as commentators and policymakers have begun to show greater interest in what we can learn about our

future directions from our economic past. Major journalistic interpreters of Australia's story have come to rely very much on an economic historical narrative, as seen in works such as those of Kelly (1992) and Megalogenis (2012). It is also impressive how many of Australia's recent most influential and creative economic officials have come from an economic history background. This includes heads of the Department of Prime Minister and Cabinet such as Keating, Shergold and Watt, as well as leading diplomatic representatives such as the ambassadors to China, Garnaut and Raby.

So now is a timely opportunity, as we stand at a crossroads, with the secular economic boom and the global financial crisis just behind us, the Asian century, now in its embryonic stage, ahead of us, and a growing sense of public interest, to link past, present and future in a meaningful, balanced and informative manner. What economic history offers is the discipline of rigorous economic thinking, facility with numbers, and an awareness of how evolving behaviour and institutions influence outcomes.

The opportunity for greater public engagement is enhanced by the almost simultaneous appearance of two other major studies of Australian economic history, which suitably complement our own contribution. McLean's *Why Australia Prospered* (2013) focuses on a set of key issues and themes about the sources of Australia's sustained wealth. It plays an important role in sparking the interest of a broad set of readers who can then follow up in more detail in this *Cambridge Economic History of Australia*. Dyster and Meredith's second edition of *Australia in the Global Economy* (2012) details Australia's international relationships; it is an antidote to some rather clichéd views of these relationships in the popular press. Taken together, these three works promise to provide a relevance and accessibility to Australian economic history that has been lacking for too long. Even within university teaching it is interesting in Australia to witness the rebirth of economic history in graduate business schools as business history subjects and in undergraduate commerce and social science programs as introductory and institutional economics. Correspondingly, business history has emerged as a major new research area of the discipline.

While engagement and relevance are worthy and appropriate aims, this volume, like all Cambridge histories, is foremost a scholarly work designed to present an expert state-of-the-art view of its subject. In organisation, the book combines chronological with thematic approaches. While recognising the shortcomings of either of these approaches by themselves, blending them presents its own challenges. Three framework chapters sit atop the study not confined to any particular period or theme: historiography, the broad

drivers of long-term growth, and the organising concepts for development for Australian economic evolution. These chapters by Coleman, Madsen and Lloyd respectively provide the broad conceptual frames for the economic history approach as deployed for Australia. Coleman follows the essential writers, Madsen fundamental econometric insights, and Lloyd the central ideas that provide context for the issues examined in the history of Australian development.

As Hunter reminds us in Chapter 4, economic historians have, until recently, largely ignored the Indigenous contribution to economic development before and after British settlement. His chapter provides a careful account of the pre-1788 economy and the impact of the arrival of the settlers. The chronology is continued up to the present by Altman and Biddle in the closing chapter of the volume, while Indigenous perspectives have been woven into other chapters at the discretion of each author. Meredith and Oxley's study of the convict economy is treated as akin and complementary to Hunter's analysis of the Aboriginal economy as a separate transitional phase, given its distinctive nature. This separate treatment of each of the prior Indigenous and convict economies in Part 2 motivates questions about their legacy for modern Australia that merit greater consideration among future researchers, sitting alongside the more familiar story of enduring British influence.

A set of chapters on the colonial economy then follows as Part 3: technology by Magee, natural resources by Greasley, labour by Seltzer, business by Ville, infrastructure by Pincus and Ergas, and urbanisation by Frost. These themes are all central to understanding the progress of the colonies prior to Federation. Discussion of resources, infrastructure and urbanisation is carried over post-Federation. In Part 4, twentieth-century developments in technology are examined through the lenses of Hutchinson on manufacturing, Merrett on big business and Wilson on government policy.

The continued importance of, and changes to, both labour and enterprise warrant separate chapters in Part 4, which is concerned with the formation of a 'national economy' in the decades following Federation. Hatton and Withers cover the former while Merrett deals with the latter. There are also studies whose prime focus is the 20th century but which require an earlier preamble for the colonial period, including the chapters on capital markets and on services by Maddock and Keneley respectively.

The important policy and external relations shifts that occurred in approximately the final four decades of the 20th century are themes captured in Part 5, which addresses the building of the modern economy. It

considers in more depth the key globalisation and liberalisation processes that characterised that period and how policy drove and responded to these for Australia. Pomfret examines internationalisation and Borland and Keating focus on microeconomic and macroeconomic policy change during this era when Australia once again came to terms with being an open and flexible economy, as it had to varying degrees across the colonies in the later 19th century.

The final set of chapters, in Part 6, addresses broad themes that have a retrospective tone to them, covering most of the previous two centuries. The studies include long-term changes in wellbeing by Shanahan, the environmental impact of economic activity and its property rights regimes by Harris, and the development of the statistical collections, so important for economic history, as a basis for assessing long-run economic performance by Butlin, Dixon and Lloyd. The latter is linked to the statistical appendix at the end of this volume, which provides tables of long-run data sets for many key topics. The concluding chapter is that of Altman and Biddle on the Indigenous economy in the period from 1850 to the present.

Some important topics have been woven through chapters rather than addressed separately. These include among others the role of women, as especially examined in the labour market; the nature of the community sector, including in economic and social affairs; and the growth of consumer markets. More work in these areas clearly awaits the research agendas of Australian economic historians, despite important past contributions (Alford 1984; Cromwell & Green 1984; Whitwell 1989). A further element cutting across many chapters is the importance of regional distinctiveness within Australia. Britain's relationship with Australia before Federation was with a series of separate colonies. The continuation of these distinct identities for a century helped shape the particularism of Australia's modern Commonwealth and the nature of its institutions. With this in mind, authors have been encouraged to seek out, where appropriate, developmental comparisons and contrasts among colonies and states.

The approaches adopted by individual authors and the work as a whole reflect the greater sense of looking outward mentioned above. The earlier focus on a free-standing discipline examining mostly aggregate macroeconomic aspects of Australian development has been superseded by an approach that embraces the broader geographic region; reaches out more explicitly to related disciplines, including economics, politics and history; and generates a form of economic history that recognises more readily the particular contributions of microeconomic behaviour, development economics, the history of economic thought, and business history. It also seeks increasingly to draw

on comparative perspectives across the globe – considering Europe, Asia and North America, other settler economies, and emerging and developing economies.

As indicated, one of the strengths of economic history, gained from drawing on a range of disciplines and perspectives, is its methodological pluralism, which spans historical narrative, econometrics, conceptual-cum-theoretical insights, institutionalism, and the development and deployment of descriptive statistics. Recognising the importance of engaging a wide audience, the contributing authors were encouraged to eschew technical material and methods. This especially relates to econometrics, which has made a valuable and enduring contribution to research in economic history, particularly since the rise of the so-called ‘new economic history’ from the 1960s. The central findings of work based on econometrics are variously reported in the volume but not the methodology itself. Case studies, more accessible to the reader, have been included where possible to provide colour and depth, although space constraints mean they are limited in number and length.

Multiple methods and varying disciplinary backgrounds are a source of creative tension among contributors. There is no single party line nor, sometimes, agreed interpretation. The editors see this as a source of strength of the book and indeed the discipline, and these differences provide for reflection on promising directions for future research. The reader will find some differences of interpretation and indeed of statistical enumeration, the latter of which has a rich tradition in Australian economic history. There are various sources of contested terrain, indeed even between the editors! These particularly include the different sources of growth, the impact of the gold rushes, the role and quality of management, and the relative importance of technology transfer or trade policy effects as critical transmissions from the international economy.

However, Australian economic history is certainly not just about disputation, and this book helps to draw attention to widely accepted interpretations and perspectives. The size and legacy of the pre-colonial Aboriginal economy was until recently grossly understated, something now clearly overturned (Hunter, Altman and Biddle). The role of migrant human capital (Madsen, Meredith and Oxley, Seltzer, Hatton and Withers), the dominance of big business (Merrett), the importance of interaction with the international economy and the changes in key relations (Pomfret) are all emphasised. Likewise, the centrality of land and its usage to Australian development (Madsen, Greasley, Frost), the nature and extent of the service sector (Keneley), the historical issues behind the trade-off between development and its environmental

impact (Harris), the importance of inter-firm relations built on social capital (Ville), and the identification of appropriate comparator nations, particularly among other settler economies, all permeate the study. Other questions now also arise, as is the nature of scholarship, and these would benefit from future research – and the authors provide their own thoughts and suggestions for a rich banquet of challenges for future inquiry.

As it stands, Australia provides a fertile landscape for such investigations. As a nation it has achieved much, by world standards, in its short recorded history. By most measures, Australia is a land that has attained standing as a country that, more than most, is fair, prosperous and free. It has also made its mistakes and has yet to rise to many important challenges to its standing. But management of its achievements and understanding of its failures are sources of great insight for a better future in Australia and elsewhere.

Indeed, the clash of various positive and negative interpretations, drawing differently depending upon value perspectives, has become termed the ‘culture wars’ in wider Australian historical interpretation. The solution to such clashes is the marketplace of ideas: more examination of the status of what we know, according to the rules of logic and evidence and the understanding of values. This volume seeks to make its contribution to knowledge from such perspectives. The transfer of lessons from the past into the future and the transfer of insights from one place to another is a most imperfect enterprise. But to not learn from the past and from others is even more so.

PART I

★

FRAMEWORK

The historiography of Australian economic history

WILLIAM COLEMAN

Introduction

Australian history is, of course, largely economic history.

D. B. Copland

Over the past century a body of history has been written that includes some of the most vivid specimens of any kind of Australian history, and that, perhaps of all Australian history, strikes closest to the country's concerns. This is Australian economic history, a history that is 'Australian' not only in reference but also character; a history that shares little pedigree with British economic history, and remains apart from the practice of American economic history.

This chapter tells the story of writing this history by means of a schema of 'four generations'.

Chroniclers of progress

The Australian Commonwealth came into existence in 1901 without an economic history. This was not for any lack of interest in economic matters, but more on account of the intimate dependency of a barely fledged Australian intellectual life on British academic capital. Professor Walter Scott of the University of Sydney illustrates the point. He was an earnest advocate of political economy at the University, a founder of the Australian Economic Association, and author of the first paper in the *Australian Economist*. And yet in that paper Scott asserted that Australia had no economic history (Scott 1888). Born in Devon and dying in Oxford, Scott saw economic history as the transformation of feudalism into capitalism, and Australia could have no part in that story. Scott underlined the truth that if Australia's economic past was to acquire any significance it would be on account of it being Australian,

rather than serving some other concern, and that such a significance would require the existence of a 'national consciousness'. Such a consciousness did exist at the time of Federation. And this consciousness was actually given some space by the incongruent subject matter of British economic history. For if Australian economic history had nothing to offer England, equally English economic historiography of the day had little to offer Australia. Its focus on the rise of capitalism and the Industrial Revolution – the characterising feature of British economic history during the sway of R. H. Tawney – was irrelevant to Australia, and it is unsurprising that the first Tawneyite seedling to fall on Australian soil – the appointment in 1914 of a Yorkshire Workers Educational Association lecturer, Herbert Heaton, to the University of Tasmania – failed to take root (King 2006).¹ But why, then, did not an Australian economic history bud in the vacant soil?² Perhaps because 'natives' in beholding the passage of the preceding century were engrossed by the progress they saw; and such progress beckoned to the future as much as it honoured the past. The 'Federation generation' did not, therefore, bring forth the economic historian, as much as the statistician-participant-observer, who was concerned to record and hail Australia's *Rise, Progress and Present Condition* (Westgarth 1861). The acme of these efforts was *Labour and Industry in Australia from the First Settlement in 1788 to the Establishment of the Commonwealth in 1901* (1918) by T. A. Coghlan (1855–1926), the New South Wales Statistician.

Coghlan's 2449 pages constitute a great, pullulating Victorian panorama in words and numbers that seemingly capture every person, law and landmark (and do not exclude bushrangers). Beyond its use as an encyclopedic reference work, its enduring value lies in its bounty of quantitative data. Much of this later proved an essential input into estimates of national accounts; other elements remain standing in their own right, with Coghlan's figures for gold production remaining unsurpassed. And posterity has ultimately granted him his famous claim to use his own name as the authority for the statistics he cites.³ Yet Coghlan's march past of dates and numbers reflects his lack of anything

- 1 Before he left Australia Heaton had published *Modern Economic History: With Special Reference to Australia* (1921). This work, in truth, has little reference to Australia. Tellingly, Heaton's subsequent successful research career in Canada was, in the judgment of Harold Innis, 'handicapped by the preconceptions formed in the study of English economic history' (Innis 1956, p. 11).
- 2 Tellingly, the first monograph that could be described as professional Australian economic history – a doctoral dissertation on the history of colonial tariffs – was by a Canadian (Allin 1918).
- 3 But need we believe him when he announces that '75 percent of the vegetables of the country are grown by Chinese' (p. 1331)?

like an organising theory. That lack, admittedly, gave a space to the vagaries of human nature that perhaps befits a historian; 'the genius of unrest had entered the souls of the squatters and they pressed outward, leaving good country to seek better and too often finding worse' (Coghlan 1918, p. 243). But his explanation of events is a bit perfunctory; things come to pass too easily.

For all its merits *Labour and Industry* was not a successful publication. The prose is brisk, but also 'interminable'; Coghlan spurns entirely the use of the footnote; he shot a vast uncomposed photograph, leaving the viewer at a loss what to make of it. The original edition is a rare book.

National storytellers

World War 1 broke the spell of progress, and from the invigoration of Australian academic life in the war's restless aftermath there germinated the first genuine economic history of Australia. Over the next two decades a tiny cohort of self-defined economic historians in Australian academia spontaneously assumed the task of weaving the extant plenty of facts into a synoptic 'national story'. This undertaking was necessarily interpretive, and potentially critical. Indeed, the best of these national storytellers experienced a disaffection with the past that was essential to their achievement. The key figures are E. O. G. Shann (1884–1935) whose *An Economic History of Australia* (1930) advanced a liberal critique of Australian collectivism; and Brian Fitzpatrick (1905–65) whose *British Imperialism and Australia, 1788–1833* (1939) and *The British Empire in Australia* (1941) advanced a Marxist critique of Australian dependency.

The soul of E. O. G. Shann teetered between anguish and animation, and his mind thronged with drastic sentiments (Millmow 2005). 'Ladies and gentleman', he would announce to students in his opening lecture, 'it is gratifying to find you are taking an interest in the welfare of your country. But ladies and gentleman, it is too late.' 'I can still hear his voice', one former student wrote 30 years later (La Nauze 1959). What student could resist reading,

The century dawned on land seared by the worst and widest drought white men had seen. In New South Wales after six years of abundant rainfall from 1889 to 1894, eight successive years of subnormal rainfall culminated in 1902 with a year in hell. (Shann quoted in La Nauze 1935, p. 49)

The students called him 'bolshie Teddy', but by the time he was to write his *History* he had thrown over the Fabianism of his youth in favour of an ardent individualism.

Shann's individualism did not amount to a philosophy of the ego. Nor was it a 'magic of the market' message, despite his evident relish in reporting that in Botany Bay's attempt to feed itself, 'the exchange economy ... inevitably triumphed over [the] communism' of government farms. Shann's individualism amounted to his belief in the significance of the variety of the individual constituents of human society. Few were they of mettle strong enough to pass the tough tests of life, of strength of mind to resist delusion, of the character to not yield to the strain. And where were those qualities most needed and hard-pressed but in our wide, brown land's sweeping plains? 'Big sheep men', he wrote, are the 'most characteristic and economically important Australians.' Shann's individualism harmonised, then, with his contemporaries' veneration of the wool industry, and his work might be deemed the most sustained expression of the sentiment that wool, in the words of his protégé W. K. Hancock, 'made Australia a solvent nation, and in the end, a free one' (Hancock 1930, p. 12). In this vision the leading problem for economic history was to explain how 'wool, from being dumped in waste hillocks in Hobart and Sydney ... ousted Spanish and German supplies from the principal markets of the world' (Roberts 1933, p. 339). To Shann's mind, the root answer lay in the freedom of action conceded the great originals of the human species, such as John Macarthur. But inasmuch as Macarthur and his likes fathered the wool industry, it was also true that wool fathered the likes of Macarthur. Australia's official war historian, C. W. Bean, put it this way: 'The wool industry turns out wool and meat and tallow and glue and cold cream, and many other things. But the most important things it turns out is men' (Bean 1910, p. viii). Shann's sentiment exactly.

This hypothesised social ecology of squatterdom set the scene, in Shann's mind, for the two political dramas of the mid 19th century: squatters versus governors and the imperial government, and the following generation's struggle of squatters versus the legislature and 'the people'. To Shann the people were Shakespearian groundlings, shallow and manipulable. He deplored the demagoguery that exploited them so as to disconnect parliamentary law from economic law. He argued the counterproductiveness of egalitarian legislation, and contended that free selection actually 'completed the transfer of Australia felix in fee simple for pastoralists' (Shann 1930, p. 214). Australia's 'tragic flaw' was the 'relative absence' of 'big sheepmen' from politics, and the consequent neglect of the fact that 'neither parliament nor representative boards had it within their power to amend the soil' (Shann 1930, pp. 211, 225).

Fitzpatrick's history forms a neat counterpoint to Shann's. From a modest background, Fitzpatrick secured a scholarship to study at Melbourne

University where he founded the Melbourne University Labor Club. And that takes us to the most obvious contrast between Fitzpatrick and Shann: their opposite political trajectories in life. Shann had discarded his youthful Fabianism for a sometimes militant liberalism; while the apolitical ‘conservatism’ of Fitzpatrick’s earliest adulthood soon receded before his lifelong commitment to the left.

At one level Fitzpatrick’s two volumes were an explicit ‘Marxist’ retort to Shann’s ‘liberal’ *History*. Shann’s ‘peculiar account’ of Botany Bay – with its provoking categorisation of the prison farm system as ‘communism’ – was to be disposed of as a ‘delusion’. Botany Bay was all about rationing – and rationing ‘was not, of course, communism of any kind’ (Fitzpatrick 1939, p. 91). On Botany Bay Fitzpatrick focused his own Marxising lens: the aspiration of the governors was to ‘plant a peasantry’ in the face of ‘an officer’s movement to ‘enclose’ the new struggling peasantry’ (1939, p. 15). But Fitzpatrick’s bigger theme was that ‘the story of Australia at this formative stage is ... the story of an economic utilisation of colonies to meet the needs of the imperial country’ (1941, p. 132). In Fitzpatrick’s eye the colony lacked any significant internal dynamic: ‘New South Wales expanded as Britain expanded’ (1939, p. 299), ‘English capital was the motive power for what took place’ and New South Wales amounted to a series of ‘scenes of British private capital investment’ (1941, p. xiii).

Discipline builders

In 1935 Shann lost ‘life’s unequal struggle’, and from 1941 Fitzpatrick’s attention wandered from economic history. These two pre-eminent figures of the interwar period were shooting stars who made their mark in bursts of inspired ardour. They blazed the trails, but could not peg out the future settlements.

It was in the surge of national confidence in the decade after World War 2 that a cluster of young economists undertook to foster a national discipline of economic history, whose members would practise their craft expertly their entire professional lives. This ambition was of a one with the ‘prestige’ national cultural projects of the day: the Australian Dictionary of Biography, the Australian Encyclopedia, the Australian National University, chairs in Australian literature and the Australian ballet and opera companies. In sympathy with this mood, this new discipline would furnish a narrative of Australia’s economic development that would do more credit to the country than that suggested by preceding economic historians: a picture of an

Australia more 'self-determined' than some venture of overseas capital; an economy more complete than a medley of sheep runs and ports.

The pre-eminent figures in this phase were Sydney James Butlin (1910–77) and his younger brother Noel (1921–91).

Sydney James Butlin

Syd and Noel grew up in the proud and thriving New South Wales provincial centre of Maitland on the Hunter River. The town was, in fact, the coalescence of two towns: West Maitland, founded privately in 1819 to accommodate the river trade, and the 'official settlement' of East Maitland established a few years later. The comfortable symbiosis, one might speculate, formed a template for the Butlins' understanding of the relationship of market and state sectors.

At Sydney University, Syd was beguiled by the dramatic representations of economic history by G. V. Portus (1883–1954), the clergyman-scholar who had sincerely sought to believe in Marx, had failed and had ended by refuting Marxified interpretations of the Eureka Stockade.⁴ In his subsequent study of economics at Cambridge, Butlin was selected to join 'Keynes' Club', but 'was not easily impressed'.⁵ Butlin responded more to his tutor, the scholarly banking theorist Denis Robertson, who was perhaps his most decisive single influence. Butlin returned to Sydney, where a Royal Commission on Banking would provide a rivet for his intellectual energy.

Over the next 40 years Butlin laboured to provide a comprehensive anatomy of Australian banking and monetary institutions from 1788 to 1959. From the dark, messy chaos of colonial accounts he decocted a fully integrated set of national banking statistics (S. J. Butlin 1986). In the *Foundations of the Australian Monetary System 1788–1851* (1953) he also mapped the burgeoning thicket of undesigned monetary institutions, from the advent of the First Fleet – without the convenience of money or a treasury – to a 'fully organised capitalist community' by 1851. The work was monumental, exhaustive and, perhaps, too comprehensive. One wonders if there was loss in Butlin shunning the episodic history of the kind that David S. Macmillan was pursuing in *Debtor's War* (Macmillan 1960). Butlin's taste for epochal history also seems lacking in point of view; and it is this lack of 'position' that

4 'The Eureka Stockade, sometimes quoted as the first pitch battle between capital and labour – a kind of economic Runnymede of Australia – was ... nothing of the kind.' The quotation is from Portus (1933b, p. 276), but captures the 'revisionist interpretation' of the event expounded later by historians such as Blainey.

5 See S. J. Butlin (1951) for his not completely admiring memoir of Keynes.

distinguishes Butlin's magnum opus from the contemporaneous and essentially parallel *Monetary History of the United States* of Friedman and Schwartz. But, somewhat reminiscent of the American study, Butlin in his *Australia and New Zealand Bank* (S. J. Butlin 1961), suggested that Australia's recovery in the 1930s owed more to market mechanisms, and less to 'policy', than had been previously allowed; this thesis was later elaborated in Schedvin's *Australia and the Great Depression* (1970).

Noel Butlin

Noel followed his elder brother to the University of Sydney, where he was attracted by the example of (Sir) Robert Madgwick (1905–79), whose *Immigration into Eastern Australia, 1788–1851* (1937) had ever so slightly raised the stock of pre-gold rush immigration. But Madgwick's literary model was a false light, and a chance encounter proved more significant. Sent as a 'very able lad' to Washington DC in 1945 to assist in planning the UN's FAO, Butlin met in the Australian legation James Brigden, another one-time export of England's WEA to the University of Tasmania. Brigden had not pursued Australian economic history any more than had his predecessor, Herbert Heaton. But Butlin was 'delighted' to see that Brigden possessed *Labour and Industry*; Brigden earned Butlin's enduring esteem by immediately presenting Butlin with the prized four volumes (Snooks 1991).

Back in Sydney Butlin won permission from the New South Wales Statistician to examine, with Heinz Arndt, the Coghlan papers that had lain interred in a city basement 'untouched by anyone for years ... For three days, strapped to the waste, we worked in indescribable grime, sorting thousands of volumes onto shelves, but also finding what we were after' (Arndt 1985, pp. 15–16); the materials included handwritten worksheets for Coghlan's estimates of aggregates between 1886 and 1898. This was to result in a paper, *National Output and Income of New South Wales in 1891*, and launched Butlin's own economic history of Australia. Like Coghlan's history, Butlin's would be quantitative and material, but it would be shaped by the 1950s focus on capital accumulation, and be supported by the stronger conceptual scaffolding afforded by the development of national income accounting since 1940.⁶

The outcome *in nuce* was presented in Canberra in August 1957 (Butlin 1958), at the first national conference of Australian historians, and later

6 Butlin's close ANU colleague Trevor Swan first presented his neoclassical growth model in the same seminar that Butlin first broached his aggregates (Pitchford 2002). But Butlin's emphasis on capital was as much classical as neoclassical in its roots: his personal copy of the *Wealth of Nations* is dense with his annotations.

substantially expanded in two volumes (Butlin 1962, 1964). Their core of copious tabulations of national aggregates afforded the economic historian a finer and more reliable sense of sight, and one that revealed a distortion in the earlier perception that rural development was the key to Australian growth. To Butlin the 'leadership in expansion' in the 'completing' three decades that followed 1860 'centred not in the primary industries, but in manufacturing, the building industry, railway transport and personal service' (1958, p. 19). Neither were exports as significant; in fact, they fell substantially relative to national income in that generation.

Butlin's aggregates were not, and could not be, 'facts'. Like all economic historians crafting estimates of the past, he had to solve 'a jigsaw puzzle with a disturbingly large number of missing pieces' (Beever 1963, p. 440; Thomson 1970). Like all economic historians crafting estimates of the past, he perforce boldly advanced on an axiom of extrapolation. Thus 'shop maintenance' in all colonies was imputed to be 4 shillings per annum, on the basis of records of the cost of maintenance of 600 Victorian schoolrooms ranging from 5 pence to 10 shillings and 4 pence. Beyond the inevitably spurious precision of the estimates, an indiscriminate reader of Butlin might conclude that the apex of achievement was the calculation of some national or sectoral aggregate. This apparent premium on aggregates seemed to speak of an 'aggregate production function economics', where only aggregates are necessary to explain aggregates. This outlook underpinned an implicit functionalism in Butlin, whereby the pieces of the economy tend to dovetail harmoniously: in Butlin the allocation of resources is only 'inefficient' in inverted commas. Illustrative of this functionalism is his favoured thesis that private capital formation and public capital formation have cooperated over the course of Australia's history, rather like West and East Maitland.

Butlin's 'aggregate production function economics' was buttressed by his economic history being decidedly 'pure' in its economics. The close interaction between the political and the material – which interwar practitioners took for granted – was neglected. 'Aggregate production function economics' also cohered with an internalist leaning in Butlin's vision, in which relative prices and the terms of trade receded into the background. This internalist bias had less success with the discipline that was quickening about him than his 'pure' economics. In 1964 John McCarty, under the rubric of the 'staples theory' of Harold Innis, urged how crucial it was to colonial Australia to have secured an international export staple (McCarty 1964). This imperative amounted to more than the benefits of 'comparative advantage'; it was a matter of the impossibility of achieving any significant division of the labour

within the tiny domestic market provided by the infant colony. The only hope for achieving an English standard of living was to take advantage of the rest of the world's division of labour by becoming a 'plantation economy', with an outsize ratio of exports to value added. This vision was congruent with the older stress on wool, but McCarty made the point more conceptually, and more generally, extending, for example, the concept of the staple export to the export of imprisonment services. Butlin flared, but the significance of the openness of the Australian economy was accepted (see, for example, McLean 1988 and Sinclair 1976).

Perhaps the feature that seemed most noticeable about Butlin's history to non-economists – its quantitative character – was the least distinguishing feature from other contemporary economic historians. In his 1954 *Economic Development of Van Diemen's Land, 1820–1859*, Max Hartwell (1921–2009) had already taken care to delineate the quantitative profiles of his subject. And he did so without sacrificing the political and global contexts, or sharing Butlin's functionalist dualism of market and state. Hartwell had grown up in the tiny New England dairy village of Red Range, which had sprung up spontaneously in the late 19th century, and in which, he later recalled, 'you were never aware of the state' (Hartwell 2008). In Hartwell there lay a possibility that quantitative economic history adjoined to a different set of assumptions than those of Butlin. But any such possibility was lost when Hartwell resigned from the University of New South Wales in 1956 in protest at the apparent mistreatment of Russell Ward, and henceforth deployed his quantitative skills in studying the Industrial Revolution from the vantage point of Oxford.

It might also be said the quantitative feature of Butlin's new history – which seemed so novel to non-economists – was also, in fact, the weakest indicator of the future. Certainly Butlin's program of quantification flourished for another three decades, and culminated in the exploration of alternative indicators of the standard of living, such as the weights and heights of the population (e.g. McLean & Pincus 1983). But data alone are sibylline with respect to cause and effect. One response was to construct models on the basis of stylisation of the data Butlin had prepared (e.g. Sinclair 1977); but a still more radical reaction would be to deploy statistical theory to squeeze inferences from historical data. This was the approach that was to engulf US economic history during Butlin's career: the 'new economic history', usually dated from the same year as Butlin's first public outing of his research – 1957 (Coats 1980). But Butlin had little interest in 'cliometrics'. The 'Butlin revolution', as it was dubbed at the time, was not, then, entirely transforming, and perhaps forestalled a still more radical shift.

Geoffrey Blainey

While Shann and Fitzpatrick were literary minded, sensitive to political context, and historians by training, the Butlins and their students were quantitative in method, austere material, and had at least moderately advanced qualifications in economics. Exacerbating this parting of ways of economic from general history was the complete neglect of economic history by the new wind in Australian history, Manning Clark.⁷ There was, then, in the post-war period 'a sharp decline in understanding and sympathy between two important branches of historical writing' (Schedvin 1967, p. 1).

Yet, in the same period, Australian economic history was enormously stimulated by one historian who eschewed the recent innovations of the economist-historians. Raised in Ballarat and Geelong, Geoffrey Blainey was, like Shann, educated at Wesley College (on a scholarship for the sons of Methodist ministers) and at Queens College of the University of Melbourne. There he became absorbed in the 'Melbourne School' of history, but seemed to belong to no school but his own (Macintyre 2003). On completing the prescribed program of studies he did not trouble to take out his degree, but instead threw himself into earning his living as a freelance author. His subject was the mining industry, and his first story was one of its least glamorous, most benighted chapters: copper extraction at Mount Lyell in Tasmania's rain-sodden west. One reviewer of *Peaks of Lyell* (1954) judged 'a history of mining in his hands could well be a classic' (McCarty 1956, p. 163). The classic came in the dazzling *The Rush That Never Ended* of 1963. Here mining is the volcano beneath the caldera, whose irregular eruptions have episodically thrown the still waters of Australian economic life into an anti-bourgeois rumpus of triumph, death, madness, cunning and luxuriant plenty. In *Rush* there are no tables and graphs; Blainey preferred to smelt a mass of mining and factory censuses into telling comparisons.⁸ But there is a storyteller's sharp eye for human nature.

Blainey complemented this human canvass with a larger message that complemented, and yet differed from, Butlin's demotion of wool. To Blainey, wool's role in Australia's development had been exaggerated relative to gold and other metals (Blainey 2010). This reapportioning of credit to gold was not quite new; it had been aired in the 1933 study of the gold rushes by G. V. Portus. Blainey also absorbed earlier reinterpretations in his most

7 At least in Clark's six-volume *History of Australia* (1962–87). Clark had been greatly interested in economic history in the earliest part of his career.

8 Blainey established that even in the 1880s more steam power was used in Victorian gold mining operations than in Victorian factories.

famous work, *The Tyranny of Distance* (1966). 'Much of Australia's history', he contended, 'has been shaped by the contradiction that it depended intimately and comprehensively on a country that was further away than almost any other in the world' (1966, p. 339). This stress on the extreme remoteness occasioned a re-examination of the motives for the establishment of Botany Bay. Here Blainey drew attention to the novel light cast on this question in 1952 by Kevin Dallas (1902–88), the one shoot of Tawneyite economic history that managed to sprout in Australia (Roe 2007). Dallas, another beneficiary of the mentoring of J. B. Brigden, was an ardent member of the WEA, as well as a Marxist materialist with a nose for the economic motive. In *Trading Posts or Penal Colonies* ([1952] 1969) he had interpreted the establishment of Botany Bay as a move in the mercantilist game of cornering international trade by securing well-located economic bases. Blainey pursued this locational angle by doubling the knot with the suggestion that the commercial benefit of this new base lay in the supply of certain requisites of sea transport (flax for sails and pine for masts). His thesis was criticised (Bolton 1968) but the presumed motives of the establishment of Botany Bay were permanently broadened.

Although at one with the materialism of postwar economic history, Blainey remained otherwise apart. His approach bears a greater likeness to E. O. G. Shann than any other historian, especially in its geographical determinism, its individualism, and its wish to memorialise 'the fight, the struggle, the courage of it all' (Blainey 1977). But as with Shann, it is hard to pinpoint the impact of Blainey's work on the larger discipline. Beyond the stimulus of a suite of strong hypotheses, perhaps its greatest significance lay in his near itchy readability. There is no author of Australian economic history who has been more read, or more enjoyed.

Renewal

When Noel Butlin studied at Sydney University in the early 1940s, the pass course in economic history consisted largely of British economic history ('mostly feudal'), with one term on Australia. Over the next 30 years the situation was radically altered: what had been a sparse field of disconnected solitaires and mavericks was transformed into a fraternity, one that was structured about key figures and filled out with associates and research students. It possessed a text designed for undergraduates (Shaw 1944), its own journal from 1956, its own conference from 1969, and its own literature, which won the imprimatur of a survey article in the *Economic History Review* (Schedvin 1979).

But in hindsight Schedvin's 1979 survey of Australian economic history was the coda of the postwar economic history gavotte. For sometime around the 1980s, the apparent orderly configuration of postwar Australian economic history began to dissolve. In this we are in part observing a generational transition; the sort of transition that characterises the periodisations outlined by this chapter. Coghlan was born in 1855, Shann in 1884, the Butlins' birth years average out at 1915; and 30 years after that were born the baby boomers, who made their mark in the fourth decade of their lives.

But the change was not just generational. The truth is that in the 1980s the broader foundations of postwar economic history were dislodged. A great swing of the ideological pendulum to the right placed the 'Australian settlement' – wage regulation, financial control, state corporations, and tariff protection – under severe challenge. In addition, various philosophies of liberation had burgeoned that were confident that history would provide raw material for 'the critique'.⁹ Both these cast a pall over the benign 'landscape of development' that had been painted by the preceding generation of economic history, and both exerted a disintegral force upon the associated research program.

From the Dreamtime to time on the Southern Cross

Most emblematic of the shift in concerns of economic history around 1980 was the plunge into Aboriginal economic history by N. G. Butlin, whose *Economics of the Dreamtime* (1993) wove a dense mat of fact and guesswork. In its concrete particulars it was not dissimilar to Blainey's earlier *Triumph of the Nomads* (1975), but it was more deeply resonant of the contemporary reference of the history. Butlin's pursuit of the Aboriginal economy also arose in part from a push backwards into the relatively neglected pre-gold rush economy. The most spectacular single traverse of that territory was made by *Convict Workers: Reinterpreting Australia's Past* (Nicholas 1988a), which combined then novel quantitative methods with a strain of social history echoing E. P. Thompson. A team of economic historians from the University of New South Wales assumed the arduous task of building a data set of 19711 convicts transported to New South Wales in the 1820s and 1830s, allowing a more detailed analysis of this human material than was possible previously (e.g. Robson 1965). Their analysis concluded convicts were not common criminals but 'ordinary working men and women', who (contrary to previous judgments) constituted

⁹ A little earlier a 'new left' Marxism had repudiated Fitzpatrick's interpretation of Australia as a 'proletarian nation' in favour of Australia being capitalist whelp (see Snooks 1975a).

a valuable economic input. The work occasioned a robust controversy, with the authors criticised for taking at face value the occupational identifications claimed by convicts (Shlomowitz 1990; Nicholas 1991).

Convict Workers was paralleled by research from Noel Butlin that saw sustained exposition only posthumously (Butlin 1994). In *Forming a Colonial Economy* (1994) we glimpse something new in Butlin: an attention to the intersection between the political and the economic. He dissects the Rum Rebellion as a clash between the impersonal state, which Westminster had aspired to plant in Botany Bay, and the inevitable importation of the 18th-century British tradition of personal governance through a privileged class.

Political economy and institutions

Butlin (1985b) pursued that intersection of the political and the economic in the early colony by unearthing the buried and mysterious workings of the 'Fisc', making good in part the neglect of public finances that had received only passing glances (but see Patterson 1968 and Smith 1993). His most ambitious exercise in political economy (Butlin, Barnard & Pincus 1982) restated his long-formed thesis of 'almost a partnership' between private and public sectors since the gold rushes (a simple version of which was rebutted by Jackson 1985). But chapters by his co-author Pincus directed attention to dysfunctional relations between political and economic motives in government enterprises, drawing on the precedent critiques of the hapless history of agricultural policy by agronomists and geographers, including Davidson (1969) and Meinig (1962).

At about the same time the nexus between the political and economic was being explored in several comparisons of Australian history with other countries' histories (Australia and Argentina: Fogarty & Duncan 1984; Australia and South Africa: Kennedy 1984; Australia and the Pacific Rim: Frost 1991). A later mushrooming of quantitative multinational comparisons tended to douse any sense of Australian exceptionalism, as these comparisons correlated Australian experience with common international trends (Acemoglu, Johnson & Robinson 2002; Broadberry & Irwin 2007; O'Rourke, Taylor & Williamson 1996). How to 'tame' one well-known international comparison – that mid-nineteenth-century Australia had the highest per capita income of any country – almost came to constitute 'the' problem for students of Australian economic development – and was the setting-out point of Ian McLean's judicial synthesis of the 'fourth generation's' broader outlook on the sources of Australia's growth (McLean 2013).

Some 'brave new worlds' of economic history

At a less aggregative level, the renewed interest in the not so purely economic provoked a 'brave new world' of economic history: Hancock (1972) provided a history of land use in Monaro in which economy and ecology are held in a single gaze, while others explored the automobile (Davison 2004a), air pollution (Cushing 2009), mental health (Doessell 2009), the family (Snooks 1994) and female publicans (Wright 2003).

Perhaps the most sustained excursion by economic history outside the workplace was in urbanisation, a topic where the two sides of economic history happily converged. From the 'economics side', Noel Butlin's suggestion that 'the process of urbanization is the central feature of Australian history' (1964, p. 6) was a cue for the study of Australia's cities. From the history side, the new engagement with social history and social theory encouraged writing the history of communities. The resultant stream of journal publications on the economic side inevitably spilt into social history: typhoid in 1880s Melbourne (Sinclair 1975; Merrett 1977) or attempts to make the city 'dry' (Merrett 1979). At the same time the histories of urban areas by historians – of, notably, Collingwood (Barrett 1971), and 'marvellous Melbourne' itself (Davison 1978) – closely scrutinised their subjects' economic dimensions.

Business history also reflected the move beyond the factory and farm gate. What had consisted of studies of a 'firm' or 'industry' began to reach up to matters of conduct and institutions: to cartels, agency relationships, self-regulation, and the whole matrix of a national corporate sector, the rise of which was mapped out in Fleming, Merrett and Ville (2004). The difference between the older and newer studies is illustrated in the different concerns of *The Australian Wool Market* (Barnard 1958) or *The Simple Fleece* (Barnard 1962), and the later *The Rural Entrepreneurs* (Ville 2000). But this new business history remained in touch with economics as much as with Chandlerian management doctrine, which may explain why business history in Australia – in contrast to the United States – remained within the orbit of economic history.

The shift in focus of business history away from the firm also constituted an opportunity to 'reach down' to the entrepreneur. Entrepreneurial biography had been well established in the United States by the 1950s, and was in the same decade hopefully broached in Australia. But there was a tendency for entrepreneurial biography to fall into either history of the individual (e.g. Bolton 1964) or the history of their businesses. In more recent years truer entrepreneurial biographies have been supplied – of James Tyson (Denholm 2002), and of Ben Boyd, interpreted as an 18th-century spirit in a 19th-century economy (Diamond 1988) – as well as a comparative survey of Australian

entrepreneurs (Hartwell & Lane 1991). Another remit for biography to contribute to economic history was found in the exploration of the careers of economist policy advisers (e.g. Whitwell 1986; Coleman, Cornish & Hagger 2006).

Distinct from the academic literature, there has welled up well-researched history aimed at the larger reading public. Much of this amounts to extended reportage: Ion Idriess' endlessly reissued biography of the 'cattle king' Sidney Kidman ([1936] 2013); a chronicle of corporate collapses since 1828 (Sykes 1988); an account of one company's struggle to cast off the deadly legacy of its founding technology (Haig 2006); the tale of how the wool industry – that of Shann's big sheep men – fell into the grip of 'agrarian socialism' (Massy 2011); the evolution of the Australian cuisine and food industry (Symons 2007). But popular economic history also extends to the interpretative, such as a revisionist account of the meaning and significance of the Great Depression (Potts 2006).

A centenary portrait

The enduring market for popular Australian economic history contrasts with the increasingly embattled position of academic Australian economic history from the late 1980s. This beleaguered position has also been shared by Australian economics, and the two intellectual progeny of Adam Smith have experienced in Australia a similar trajectory of boom and bust. Both were born in the years after World War 1, and both were strongly policy-orientated and 'amateur'. Both rapidly professionalised after World War 2. And in recent years both have been troubled by self-referentiality, globalisation and a waning of the economic criteria. But the seeming decline in economic history has been steeper. In 1997 one appraisal of Australian economic history in the academy declared 'a general air of despondency is pervasive' (Boot 1997, p. 161). Unsurprisingly, the century ended with some 'tension' (McLean & Shanahan 2007, p. 301) and an attitude of self-examination in the discipline. What would be seen in this mirror?

The practice of Australian economic history remains distinct from that of the United Kingdom or the United States, but has no uniform 'national style'. It comprehends work located on different points of several distinct spectra.

One such spectrum would be methodological, and would stretch from 'economics' at one pole to 'history' at the other. The spectrum captures the contrast between the science and the humanity; the model and the

narrative.¹⁰ The overwhelming mass of the United States' economic history is located at the 'science and model' end, so that economic history is not so much an offshoot of economics as a field of economics. While this style accurately characterises some Australian economic historians (see Withers 2009), the tendency of Australian economic history is to sprawl much more between the two poles. Australian economic history tends to be informed by the categories of economics, but is narrative in method; it thinks like an economist, but argues like an historian.

Another spectrum would contrast history that is epochal and thematic with that which is episodic and sectional. Beyond Blainey and Syd Butlin, there has been little interest in the first style of history. Thus, while dimensions of protectionism have been extensively studied (Conlon & Perkins 2001; Merrett & Ville 2011), no Australian economic historian has yet provided a complete analytical narrative of this conspicuous feature of the Australian economy (but see Lloyd 2008). Similarly, land tenure has been subject to considerable attention (Burroughs 1967; Cameron 2005), but the only comprehensive account of this enduringly significant issue remains the youthful and obsolete venture of Roberts (1924). There have been many case studies of anti-competitive practices: the attempt by Ampol in 1938 to break the petrol retailing cartel (Dixon 1976), the insurance 'tariff' (Keneley 2002) and the Collins House Group cartel (Richardson 1987); but there has been no general history of the abiding uncompetitiveness of the Australian economy. Chapters in regulation of employment relations have been scrutinised (Forster 1985a; Sheridan 2006) but no overall history exists of Australia's singular experience. And Blainey's precis of transformation of the nature of the public company since the 19th century (1976) has prompted no history of that transformation.

Another spectrum would plot the continuum from 'internalist' to 'externalist' history – where the internalist outlook is captured by Noel Butlin's dictum that 'Australian economic history was not a footnote to the Industrial Revolution', and the opposing position by Hartwell: 'Australian history is part of British history, and British history in turn must be considered part of European and world history' (1954, p. 4). The question at issue – 'what

¹⁰ A complementary spectrum would index the 'rawness' of the material used by economic historians. At one pole lies the quantified constructs of annual reports and account books (etc.); and at the other end a Blainey undertaking field expeditions to defunct mines, or a David Macmillan discovering in the files of Sydney University a three-ounce nugget wrapped in a letter from Edmund Hargreaves announcing the discovery of gold to the Colonial Secretary.

fraction of the variance is attributable to local contingencies?’ – cuts across ideological commitments (so that such odd bedfellows as Hartwell and Fitzpatrick were both ‘externalists’), and different answers to this question make for differences in what Australian economic history is actually ‘about’. Is it about the transition (‘development’) from total dependence on a mother country to a self-standing economy? Or is it, on the contrary, about the useful integration of an isolated and seriously misunderstood resource base into the world economy? Or is it about a two-century long reorientation from Europe to Asia; or the transformation of a prison farm to free economy; or the cutting loose – or failure to cut loose – from the exploitation of natural resources?

A final spectrum would mark out the contrast between the scholar and the engagé; the contrast between the historian more interested in how the machine works, and the historian who is, at bottom, more interested in what the machine can be put to do. On this spectrum Australian economic historians have been distinctly inclined to changing the world, and not simply interpreting it. We can think of Coghlan in the fray of the 1893 banking crisis, the constitutional battles over Federation, and the clash between Jack Lang and Sir Dudley de Chair; or Shann in the thick of desperate attempts to recast Australia’s public finances in 1931; or Noel Butlin flying to Canberra to sell Ben Chifley 40 000 copies of his *Case for Bank Nationalisation*; or of Blainey’s interventions on Asian immigration and ‘the republic’. The less dramatic but prominent role of Australian economic historians in the Productivity Commission, the Department of Prime Minister and Cabinet, and the World Bank reflects the same impulse.

These positions of the spectra instanced above provide material for the most fundamental question of all: what is economic history for? The historical methodological pole clearly lends itself to the task of communicating economic issues beyond economists, which however desirable risks branding economic history as ‘economics for arts students’. Economic history of an ‘internalist’ orientation lends itself to the quest for national identity, but the interest in that project has fluctuated over time. The engagé economist finds in economic history lessons for today; thus Shann’s *The Boom of 1890* (1927) effectively compared the ill-starred long boom of the 1880s with ‘our own spacious times’; and the interest in ‘convict workers’ of the 1980s was unmistakably tied up with immigration debates of that decade. But might not the engagé equally seek lessons (clearer lessons?) from abroad? Or even from theory? And where in the above motives is ‘the past’ essentially present? In ‘the method of models’ the past is limited to certain exogenous variables

(institutions and technology) that economic theory has little to say about. The narrative method might seem essentially bound up with the past, but it can be used for the analysis of contemporary events, as practitioners of the narrative history of Australian business have shown (Boehm 1971). The past would seem to lend itself very well to any national or internalist account of Australia's economic history, as any past must be unique. But is it significantly unique?

Perhaps the foundation motive for economic history is touched on by Hugh Trevor-Roper's (1980) remark that history constitutes the 'controlling background' of current events. The notion is familiar to economists under the tag of 'hysteresis': the notion that where we might go depends not just on where we are, but how we have got there. In this vein, Shann once wrote: 'More than the crooked way of Sydney streets may be thus traced to the period of military rule' (Shann 1930, p. 27). In the understanding of its past, Australia's economic historians promise the better understanding of the country's constraints and opportunities.

Australian economic growth and its drivers since European settlement

JAKOB B. MADSEN

Introduction

Characteristic of Australian economic growth history is that agriculture and mining have been the dominant forces of economic development during the 19th century and, to a lesser degree, up to the present day. It only took a few years of structural adjustment after European settlers arrived in Australia in 1788 before Australia's per capita income among settlers reached that of United Kingdom, which was the country with the highest per capita income in the world at that time. Following the gold rush that took place at the beginning of the 1850s, Australia, in terms of per capita income, became the richest country in the world – a lead that endured to the depression of the early 1890s.

Probably the most important factor behind Australia's 19th-century's richness has been abundance of land and mineral resources. The wool industry was highly productive and competitive because of low production costs, the low weight–cost ratio, and not being heavily dependent on investment in transport infrastructure (Schedvin 1990; McLean 2013). Furthermore, replacing shepherds by fencing in the second half of the 19th century reduced the need for permanent labour. Sinclair (1976) argues that the mining sector was influential for Australia's economic growth and prosperity because of positive spillover effects for other sectors of the economy and because it redistributed large numbers of workers across the economy after the 1850s gold rush. However, being highly dependent on natural resources has had its downside in that Australia, until World War 2, was dependent on the highly volatile demand and supply conditions in the world market for agricultural and mineral products. That resulted in large booms and depressions, such as the depressions in the periods 1840–42, 1890–96 and 1930–33.¹

¹ Real commodity prices could not have been responsible for growth at medium-term frequencies over the last half of the 19th century and most of the 20th century, however.

While Australia's productivity advantage in the 19th century was, in part, a result of resource abundance, this alone could not have maintained the country's growth momentum over the past one and a half centuries without technological progress, technology diffusion and catch-up with the technology frontiers (first, the United Kingdom and, subsequently, the United States). Since productivity growth is driven by technological progress in the long run, innovation must have been one of the key factors behind Australia's productivity advances since the second half of the 19th century. Magee (in this volume) shows that Australia has been highly innovative during the past two centuries and gives several examples of innovations that pushed productivities up to higher levels. Banerjee (2012) shows that innovations have been fundamental for Australian growth for more than a century and Madsen (2010b) shows that innovations and human capital have been the main drivers of growth in the OECD countries, including Australia, since 1870.

The balance of this chapter is organised in three main sections. The first presents Australian per capita income growth rates over the past two centuries, identifies long and shorter cycles of growth, discusses the reasons behind these growth cycles and makes international income comparisons. The second section analyses how sector shares and sector productivities have evolved over the course of Australian development. The final main section evaluates the factors that are considered to be essential to Australian economic growth, such as capital accumulation, human capital, innovations, interactions with the foreign sector, and health.

Australian productivity since 1800

Per capita income growth in Australia

Three series of per capita income over the period 1800–2010 are displayed in Figure 2.1. The trend growth rate has been similar among the three series: the average annual geometric growth rate has been 1.15 per cent (Snooks 1994), 1.08 per cent (Butlin 1986) and 1.08 per cent (Haig 2001 and Butlin 1986a, combined) over the period 1800–2010. However, there are large discrepancies during the depressions of the 1890s and the 1930s, due predominantly to the choice of price deflators (Haig 2001). According to the data, from 1891 to 1896

Pope (1984) fails to find any relationship between Australia's terms of trade, on the one hand, and per capita GDP, real wages and bond yield, on the other hand, at medium-term frequencies of 40 years (Rostow's periods). Pope, however, finds some evidence of a positive relationship between terms-of-trade and net immigration.

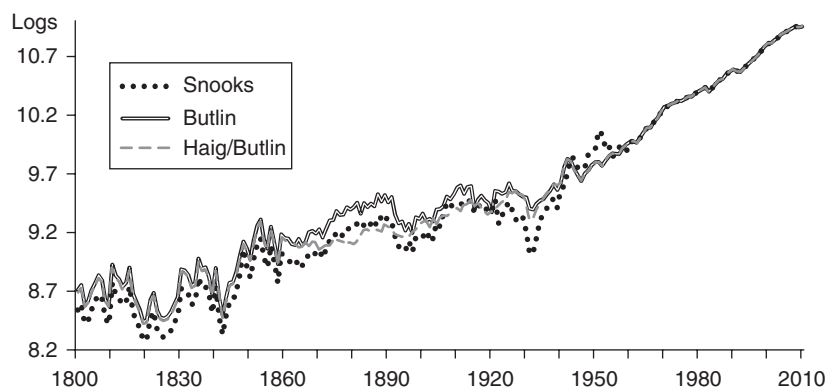


Figure 2.1 Estimates of per capita income, 1800–2010

Sources: M. W. Butlin (1977), Butlin (1986a), Haig (2001) and Snooks (1994). All three data series are spliced with official national account data in the period 1960–2010. See, for sources and details, the data appendix in Madsen (2014b). The data are in natural logs to aid accurate visual presentation.

per capita GDP fell by 14.7 per cent (Snooks 1994), 20.6 per cent (Butlin 1986a) or 6.2 per cent (Haig 2001); from 1929 to 1933 per capita GDP fell by 15.8 per cent (Snooks 1994), 5.8 per cent (Butlin 1986a) or 12.3 per cent (Haig 2001).

Alternative indicators confirm large downturns in both periods – real imports fell by 26 per cent (1891–93) (Broadberry & Irwin 2007, p. 272), nominal house prices fell by 35.2 per cent (1891–96) and 30.8 per cent (1929–33) (Stapledon 2012, p. 315) and nominal stock prices fell by 52.1 per cent (1888–93) and by 33.8 per cent (1928–31)² where the peaks and troughs in stock prices are earlier than the business cycle because of the leading indicator properties of stock prices. Assessing the overall quality of the data series, reliability tests, which compare the statistical properties of different series measuring the same thing, give unconditional support to the Butlin/Haig productivity series (Madsen 2013, p. 25), so these data are used in the analysis below.

Forces of economic growth

Figure 2.1 suggests Australia's growth history can roughly be decomposed into four growth regimes: (1) 1788–1839, with slow growth and structural adjustment; (2) 1842–52, with very rapid growth rates that brought Australia up to the highest level of per capita income in the world; (3) 1853–1946, a long

² Global Financial Data, <https://www.globalfinancialdata.com/index.html>.

period of slow growth overall but with large short-term fluctuations; and (4) the modern growth regime in the post-1946 period.

Economic life during the first years of settlement depended heavily on the government Commissariat as a supplier of goods, money and foreign exchange; however, agriculture was gradually introduced as land grants were given to senior officials and emancipated convicts were allowed to supply goods and services (Butlin 1964, 1994; Snooks 1994). The relatively low per capita income during the earliest years of settlement, to a large extent, reflected small factor and product markets and therefore lack of Smithian growth through specialisation and economies of scale and constraints on ship movements (Butlin 1994, pp. 52, 136). However, several factors during the period of early settlement laid the foundations for later economic development and efficient exploitation of Australia's natural resources. First, the skills of British convicts played a crucial role in Australian economic development (Meredith and Oxley, this volume). Second, institutions, practices, policies and legal arrangements were gradually copied from Britain in the period 1810–40 (Butlin 1994, p. 136). British contract law and systems paved the way for the foundations of quality institutions. Third, financial institutions were becoming established by 1840, allowing for note issues, deposits and advances (Maddock, this volume). Fourth, the public sector was initially a large share of the economy; it not only administered convicts, but it also established manufacturing, farming, building and infrastructure. Furthermore, the government provided access to land, medical services, education, law and order, defence and regulated prices, wages and working conditions (Butlin 1994, p. 143). As such the government was effective in providing employment, building up an effective administrative apparatus and creating the infrastructure that was a precondition for domestic and foreign trade to flourish.

There were significant discrepancies in economic development between New South Wales and Van Diemen's Land (renamed 'Tasmania' in 1856). On average Van Diemen's Land was 30 per cent below New South Wales but neither grew in per capita terms overall during 1810–50. Relative to New South Wales, pastoralism was slow to develop in Van Diemen's Land, although wheat production expanded (Greasley, this volume). A lack of capital also restricted large-scale offshore whaling in Van Diemen's Land (Butlin 1994, p. 204). Instead, people were forced into bay whaling that delivered low-grade black whaling oil and resulted in low productivity. By the 1820s and 1830s, therefore, economic activity was based increasingly on the rapid expansion of New South Wales pastoral production, with wool being shipped to Britain for auction.

Although per capita income, at world standard, was high during early settlement, Australia shot ahead during 1842–52 to have the highest incomes in the world. Sinclair (1976) and McLean (2013) both argue that the wool industry was ultimately responsible for Australia's early success, but from different perspectives. Sinclair (1976) suggests that the wool industry was pivotal for Australian growth partly because it stimulated demand for financial and transport services. Schedvin on the other hand, has drawn attention to the weak linkages between wool production and other key areas of the economy especially manufacturing (Hutchinson and Greasley, both this volume). McLean (2013) points out that the scarcity of labour but abundance of land drove hourly wages and returns to capital up to high levels, thus resulting in high value-added production in the farming sector and high per capita income for the whole economy.

Australia's success during the middle decades of the 19th century has also been attributed to mining because, together with assisted passages, the gold rushes attracted much needed labour to Australia (Seltzer, this volume). The immediate impact was negative as the gold rushes drew labour from the wool industry but in the long run labour attracted from overseas was released to other sectors of the economy as gold production waned shortly after its peak in 1852 and mining became more capital intensive (Greasley, this volume). Since the immigrants were predominantly males in their prime working age, they ensured that per capita income remained high through high labour-force participation rates.

Various explanations have been offered for the slower growth rate during the period 1853–1946: increased debt from weaker terms of trade (Butlin 1962; Boehm 1971a; Jackson 1977) and the increasing importance of manufacturing that dragged down average productivity (Broadberry & Irwin 2007). Sinclair (1976, p. 129) suggests that agriculture, in general, and wool production, in particular, were running into diminishing returns as the land expansions became less suitable for wool production and other agriculture. Furthermore, the railway links were designed to serve the mining industry more than agriculture. Finally, an increasing fraction of investment was allocated to residential building at the cost of other, more directly productive, investment (Sinclair 1976, p. 131; Ergas and Pincus, this volume).

McLean (2013) argues that the factors that maintained per capita income before the 1890s depression did not persist and he notes that Australia did no worse than most other countries between 1914 and World War 2 – a point that is confirmed by the comparative economic analysis in the next section. Schedvin (2008b) attributes the low growth in the first half of the 20th

century to the fixed exchange rate system, which prevented manufacturing from reaching a price competitive advantage and, therefore, inhibited industrialisation before the 1950s. The key to this is that the high productivities in mining and agriculture (as shown below) meant that manufacturing, due to diminishing returns to capital and labour, had to produce at low levels to cover the wage costs that were driven up by mining and agriculture. The fixed exchange rate system precluded competitive devaluations. The developmental role of government, especially through railway building and tariff policy, is discussed elsewhere in this volume (Ergas and Pincus, and Wilson).

Sinclair (1976) attributes the high growth rates of the post-World War 2 period to the strong population growth, predominantly stimulated by immigration: the higher concentration of people permitted the establishment of a more sophisticated manufacturing sector and denser consumer markets (Hutchinson, this volume). McLean (2013) attributes post-World War 2 growth to the wool price boom in the 1950s, an advantageous international environment, Asian industrialisation and, recently, the commodity price boom. The economic effects of commodity price booms are positive because, as shown below, they increase the share of high-value-added mining production, stimulate demand and increase real disposable income through a terms-of-trade income effect in which Australia buys cheap and sells expensive. Note, however, that the terms-of-trade effect is not accounted for in the GDP estimates in the figures in this chapter (see McLean 2013, p. 232). The Asian industrialisation, starting with Japan, then Korea, Taiwan, Singapore, China and India, has been positive for Australian exports of commodities, agricultural products and educational services (Pomfret, this volume).

Depressions in the pre-World War 2 period

Over the past two centuries Australia has experienced depressions or sharp downturns during 1840–42, 1890–96 and 1930–33. Common for the last two depressions were sharp reductions in prices of assets and agricultural products.

The causes of the 1840–42 depression are difficult to assess since little statistical material is available. Net imports as a percentage of GDP increased from 13 per cent in 1836 to 23 per cent in 1841 (Vamplew 1987, p. 132), indicating that the international demand for Australian produce may have imploded during that period. Per capita nominal income in the farming sector (pastoral and non-pastoral) fell by 36 per cent during 1835–42 (Vamplew 1987, p. 132), indicating a severe contraction in nominal demand for agricultural products. Broomhill (2008) argues that a crisis in the British textile industry resulted

in a large contraction in the demand for wool and a withdrawal of British capital from its colonies starting in the mid-1830s. Similarly, Butlin (1994, p. 101) notes that there was a massive drop in the private capital inflow from Britain in 1840.

The depression in the 1890s followed the pattern of a classical financial crisis in which increasing credit, speculation in property and stock markets, and emerging asset bubbles during the 1880s rendered the financial system increasingly vulnerable to external shocks (Sinclair 1976, pp. 149–55; Kent 2011; Maddock, this volume). The continuing increases in house prices and stock prices relative to the acquisition costs of property and fixed investment in the 1880s made it profitable to invest and resulted in an extraordinarily strong increase in building activity and investment in private fixed non-housing assets. The increasing investment was accompanied by rapid growth in credit, partly fuelled by capital inflows from Britain. The credit–GDP ratio more than doubled during the 1880s (Kent 2011; Maddock, this volume). Clearly, this development was unsustainable and the asset bubble eventually burst in the early 1890s. More than half of the note-issuing trading banks suspended payment and a large number of non-bank financial institutions failed during the 1890s, partly fuelled by the reversal of credit flows into Australia following the Barings crisis (Kent 2011). The combination of credit drying up and the asset market collapse were the main contributors to the marked downturn from which the Australian economy took a long time to recover. The crisis was aggravated by deflation, in general, and, in particular, a 57 per cent decline in the nominal prices of agricultural products for 1889–94 (Vamplew 1987, p. 217). Thus, farmers' debt–income ratio more than doubled and, as in the Great Depression, this contributed to the downturn in agriculture. Debt deleveraging to its pre-1880s level took almost two decades and, consequently, prolonged the demand contraction.

The Great Depression of the 1930s is probably the largest downturn experienced in Australian modern history and unemployment increased to the highest level ever recorded in Australian history (Hatton and Withers, this volume). Unemployment approached 20 per cent at its peak in 1932, indicating the severity of the crisis. There has been some debate about the causes of the Great Depression in Australia. Based on model simulations, Valentine (1987a, 2012) finds that Australia was pulled down by the worldwide depression through falling export prices and increasing tariff rates, while factors such as high foreign debt and low public investment were of secondary importance. Australia's export prices fell by 7.7 per cent in 1928–29 and by 22.7 per cent in 1929–30 (Valentine 1987a, p. 47); a large import contraction

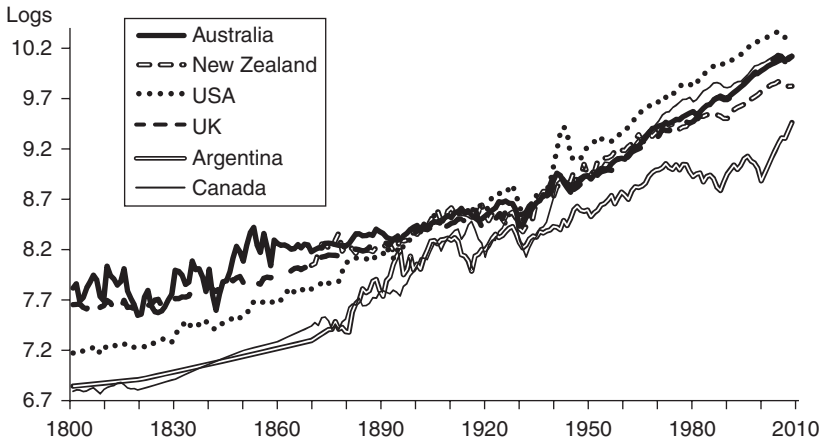


Figure 2.2 Comparative per capita GDP, 1800–2010

Sources: Maddison (2003) except for Australia, which is based on the Butlin/Haig data in Figure 2.1.

was thus required to keep the trade balance in surplus in order to service the debt. Valentine's finding is consistent with Madsen (2001) who argues that the worldwide agricultural crisis was a major contributor to the Great Depression because it reduced the income of farmers while, simultaneously, increasing the real value of their debt.

International productivity comparisons

Figure 2.2 compares Australia's per capita income with countries with similar initial conditions (Argentina, Canada, New Zealand and the United States) and with the United Kingdom, with which Australia historically had very strong trade and cultural links.³ Argentina, Australia, Canada, New Zealand and the United States were all settler economies, rich in natural resources, including vast areas of open savannah-type grassland, and were sparsely populated with indigenous people offering little resistance to European settlers. In comparative perspective Australia's trend per capita income followed that of Britain quite closely during the entire period of 1800–2011, except for 1845–90 during which Australia led the United Kingdom. Australia maintained

³ The Butlin/Haig data is preferred to Maddison's data because Maddison's data includes the Indigenous population, which implies that per capita income growth during the 19th century is driven partly by a declining Indigenous population as a fraction of the total population.

its position among the world technology leaders (the United Kingdom and the United States) until World War 2. Given that Australia's income growth was pretty similar to that of the United States and Britain during 1890–1940, one can, perhaps, conclude that the low growth rates Australia experienced in that period were part of a general trend among the world's technology leaders.

For many it has not been difficult to explain why Australia has been much more successful than Argentina over the past one and a half centuries. The relatively poor economic performance of Argentina is often attributed to political instability and poor institutions (Alesina 1997; Acemoglu & Robinson 2012). This hypothesis is supported by Sinclair (1976, pp. 98–102) who argued that key factors behind Australia's success after 1850 were the modifications to institutional frameworks that were favourable to economic development, such as the establishment of a sophisticated financial system; the creation of a free market system; and the establishment of independent democratic institutions in Victoria, New South Wales, Queensland, South Australia and Tasmania (Van Diemen's Land) by the end of the 1850s.

These arguments, though, are not entirely consistent with the Polity IV data that measure indicators for institutional quality for the period 1800–2012 for most countries.⁴ Constraints on the power of the government executive from Polity IV are often used as indicators of the quality of institutions. Accordingly, Argentina lay in the middle range up to 1930 when the indicators plunged to very low levels following General José Félix Uriburu's military coup. Excepting a few years of democracy, Argentina was mostly ruled by the military up to 1973, after which the quality of institutions improved considerably. Thus, the strongest growth divergence between Australia and Argentina occurred during a period in which the quality of Argentina's institutions improved the most, noting that, since Federation in 1901, Australia has consistently scored highly on institutional quality scales. However, this does not mean that institutions were not influential for Argentina's relative decline in the 20th century since institutional qualities often change much more slowly than indicated by the Polity IV data (Acemoglu & Robinson 2012).

A potential important difference between Argentina and Australia is related to different land rights regimes (Schedvin 1990). The patronage system and ownership concentration imposed barriers to acquisition of land by

4 The Polity IV data are available from the Polity IV website: <http://www.systemicpeace.org/polity/polity4.htm>.

smallholders on the Argentinian Pampas, while Australia adopted a system of individual property rights. In his influential book, de Soto (2000) argues that credit to farmers is a key ingredient for economic development and the wealth of nations. Essentially, the lack of formal land titles deprives the occupant from using the land as collateral to borrow against investment in fixed capital such as machinery, buildings and livestock: the so-called de Soto effect (Besley, Burchardi & Ghatak 2012). Nor, in the absence of access to credit facilities, can landholders obtain credit for fertiliser, or seeds to overcome years of bad harvests; consequently, it can take years for the farmer to recover from a weather-induced output decline. The World Bank (2003) estimates that the value differentials between titled and untitled land is 40–80 per cent today in the Latin American countries. The importance of credit for growth and development has long been advocated in the economic literature (Ang 2008). Di Tella and Zymelman (1967) claim that Argentina fared worse than Australia because of its failure to find alternative production avenues to compensate for the end of the expansion of agriculture. Australia has managed to vary its drivers of growth from mining to genuine productivity advances in agriculture and manufacturing in the post–World War 2 period, as discussed below.

Schedvin (1990) argues that a key difference between Australia and New Zealand on the one hand and Argentina on the other is that the latter was settled from the 16th century and feudal systems were introduced there. Thereafter, progress was slow and wars with the Indians caused further delays. Since land was distributed among the landed elite at an early stage of settlement, there were strong vested interests in maintaining the status quo and preventing improvements in property rights institutions in Argentina. Australia and New Zealand, by contrast, inherited a more developed institutional system and were equipped with the skills acquired by the industrialisation in Europe.

Schedvin (1985) also suggests that cultural traditions may help explain different development paths. While the Mediterranean people who occupied Argentina were the products of a more traditional society, Anglo-Saxon culture supplied the raw material for building a market society in countries such as Australia and New Zealand. This culture valued individualism, pragmatism, liberal-progressiveness and rationalism and was committed to science. The Mediterranean culture that was transported to Argentina placed more value on authority, was inward-looking, self-sufficient, emotionally bound and used to small pre-industrial agricultural societies. Paternalism and the preference for subjectively based rather than impersonal arrangements in Argentine politics reflect these norms.

A more difficult challenge is to explain why Australia had a higher per capita income than the United States and the United Kingdom during most of the second half of the 19th century. McLean (2007) explains Australia's lead over the United States by high labour-force participation rates and high productivity, with the latter resulting from Australia's high resource endowment per worker coupled with low extraction costs. Furthermore, he argues that capital intensity and education were comparable between the United States and Australia. Comparing Australia with Britain, Broadberry and Irwin (2007) find that labour-force participation rates were higher in Australia and that Australia's lead in the period 1870–90 was due to its higher productivities in agriculture and mining. McLean (2007) and Broadberry and Irwin (2007) thus both conclude that Australia's high productivity in the second half of the 19th century reflects resource abundance. Furthermore, Broadberry and Irwin (2007) argue that Australia's lead diminished as it shifted from mining and agriculture to manufacturing, while McLean (2007) suggests that the high productivity reached in Australia before the 1890s depression was unsustainable (essentially due to depletion of gold reserves) and that the agricultural expansion in the period 1860–90 was also unsustainable.

Sectoral distribution of economic activity

Figure 2.3 traces the sectoral shares of GDP. Remarkably, the service sector has since 1842 been the dominant sector in the Australian economy and has increased its share over time, particularly in the post-1960 period (Keneley, this volume). Excluding services, agriculture was dominant up to World War 2. Over the long perspective, agriculture's share decreased markedly during 1835–52, rebounded immediately thereafter and kept its share of 20–30 per cent up to 1952 and has since continuously lowered its share. The mining share, after peaks in the early 1850s and late 1890s, declined during World War 1 to a nadir of 2–3 per cent of GDP until the 1970s, after which the share has fluctuated between about five and 11 per cent of total GDP.

The sectoral changes over time have been driven by demand as well as supply factors and have roughly followed the structure of other industrialised countries (Ngai & Pissarides 2007; Merrett & Ville 2011). Following Engel's law, the fraction of a household's spending on food (agricultural products) decreases as income increases. For Australia, Merrett and Ville (2011) show that increasing consumerism during the period 1900–39 led to increasing demand for consumer durables and reduced the fraction of the budget going to food. In other words, a large fraction of home production of goods

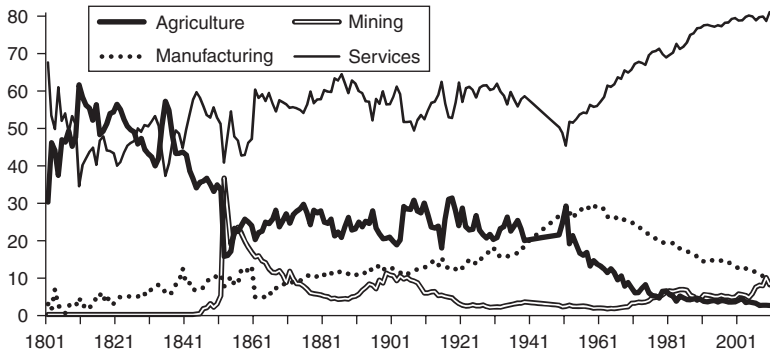


Figure 2.3 Sectoral shares of GDP, 1800–2010

Note: Agriculture is the sum of pastoral and non-pastoral agriculture.

Source: Butlin, Dixon and Lloyd, this volume. The data are linearly interpolated for 1939–49.

and services was shifted to the production sphere (also Hutchinson, this volume). Regarding supply factors, Baumol's (1967) seminal work suggests that unevenness is a general feature of growth as different sectors develop at different rates owing to variations in technological progress. Baumol divided the economy into two sectors: a 'progressive' one that uses new technology and a 'stagnant' one that uses labour as the only input. He then showed that the production costs and prices of the stagnant sector rise continuously, thus curbing demand.

The mining sector expanded massively in the 1850s, predominantly due to the gold rush. While the tools used for gold extraction at the beginning of the 1850s were quite basic, mining became increasingly sophisticated over time and the technological developments in the investment-producing sector was a precondition for a continuation of the high value-added production within mining after the gold rush. Geological surveys established in Victoria in 1852, in Queensland in 1862 and in South Australia in 1882 laid the ground for diversification and expansion of mining (Ville & Wicken 2013).

Manufacturing began from a very small base in 1800, first started to play a visible role after about 1837, and subsequently increased its share up to about 1960 (Hutchinson, this volume). As such, manufacturing contributed to industrialisation in the period 1837–1960 and has since fallen from its peak of almost 30 per cent of total economic activity to 10 per cent. The manufacturing decline since the first oil price shock is not unique to Australia but has occurred in most of the mature OECD countries, reflecting

the rise of manufacturing in East, South and Southeast Asia and the increasing dominance of the service sector.

The slow development of manufacturing before 1837 was partly related to there being few productivity benefits for other sectors of the economy arising from the wool industry. The large number of steps and the complexity of the transformation of raw wool to the final product made production a poor stimulant for Australian manufacturing (Schedvin 1990). Furthermore, the limited amount of labour required for wool production after fencing was almost completed in the second half of the 19th century, reducing the scale effects from immigration – a scale effect that has been advocated by Sinclair (1976) as an important stimulant to Australian development.

Investigating the factors responsible for the structural change of the Australian economy during 1901–39, Merrett and Ville (2011) find that consumerism (demand) combined with new technologies (supply) paved the way for a structural change from agriculture to manufacturing. Furthermore, they show that the conventional wisdom that the structural change was an outcome of a shift in government policies, particularly in relation to trade barriers, does not stand up against the evidence. Especially important for supply forces were general purpose technologies – for example, electrification and the expansion of the combustion machine that impacted on efficiency in manufacturing and in services such as car repair, telephone services, transport services and development of the electricity infrastructure (Merrett & Ville 2011).

Figure 2.4 shows labour productivity across sectors measured as GDP per employed person. The figure provides intriguing insights into the forces behind Australia's growth over the past two centuries. It shows that labour productivity in mining has been well in excess of that in agriculture and manufacturing since copper and gold extraction started in the 1840s and 1850s. The implication of this is that economy-wide labour productivity is driven up if mining expands at the expense of manufacturing and agriculture. Australia's productivity growth spurt in the period 1840–52 was, to a large degree, an outcome of increasing the share of mining and services in total GDP. Conversely, the economic stagnation over the period 1852–80 is partly an outcome of shrinking or stagnating productivity in the mining sector and, more importantly, of the contraction of mining's share of economic activity.

Mining has also been highly influential for the Australian economy on medium-term (15–40 years) and business-cycle (1–5 years) frequencies. The short- and medium-term cycles in mining productivity are determined

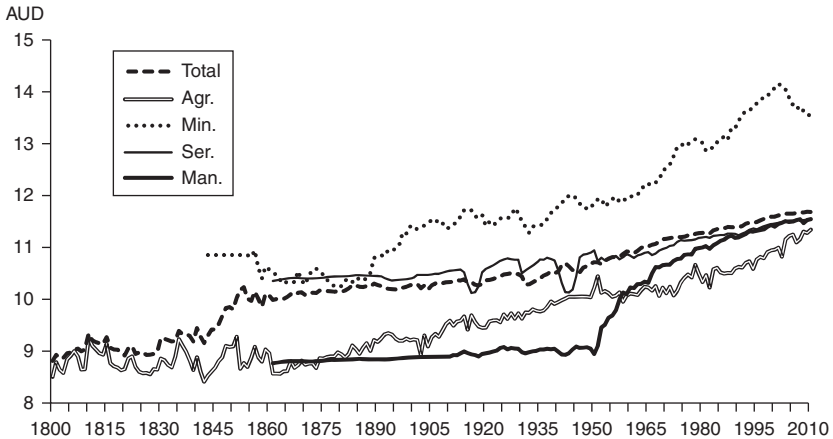


Figure 2.4 Sectoral labour productivity, 1800–2010

Notes: Productivity is measured as the log of output in 1000s of Australian dollars per full-time employed worker (including the self-employed) in 2009 prices. Agriculture is the sum of pastoral and non-pastoral agriculture.

Source: Madsen (2014b).

more by cyclicity in the real prices of minerals than by technological progress. The decline in mining productivity since 2000, for example, has been a result of the commodity price boom that has given mining companies incentives to pursue less accessible and, thus, less productive mining sites, the result being lower average productivity. This also explains the mining productivity decline during and immediately after the world wars, in the late 1970s and in the early 1980s. The decline in mining productivity in the period 1852–56, by contrast, was not induced by booming commodity prices; it may have occurred because it was still profitable for workers to remain in the mining sector despite the declining opportunities, as mining still offered higher expected returns than all alternative economic activities (Harvey et al. 2010). The economic implication of this is that the economy-wide productivity growth rates are influenced significantly by productivity fluctuations in the mining sector.

Productivity in services has also been above the economy-wide level most of the time up to 1950; however, since the employment data before World War 2 does not include the self-employed, productivity in services is likely to be significantly exaggerated and unreliable. In terms of economic performance, productivity in the service sector has not increased as much as that of other sectors since data became available in 1860. Its poor productivity

progress can, to a large extent, be attributed to the fact that productivity advances in governmental services are not accounted for and that real estate and financial services cannot be adequately measured (Keneley, this volume).

Productivity advances in manufacturing were miniscule before 1950 and, as such, contributed substantially to the slow productivity advances in the period 1852–1946. The slow growth was partly a result of a small and fragmented domestic market that rendered it difficult for firms to gain economies of scale (Hutchinson, this volume). This deadlock, however, was broken in the period 1950–66 when manufacturing productivity growth was well in excess of other sectors of the economy and was the driving force behind the high economy-wide growth rates. The productivity increase was, particularly, driven by advances in the capital-intensive industries (Hutchinson, this volume). Although manufacturing productivity growth subsequently slowed down, it remained high and ensured a convergence to the average productivity in the Australian economy. During 1950–2010 the level of manufacturing labour productivity went from 17 per cent to 87 per cent of the average economy-wide labour productivity – a spectacular performance. From an international perspective, Australian manufacturing productivity was among the highest in the world in 1890; however, it gradually lost its relative position and was well below the OECD average in 1947 (Madsen & Timol 2011). Today, Australian industrial labour productivity is approximately on par with the OECD average (Madsen & Timol 2011).

Drivers of growth

Australia's growth could only be maintained after the gold rush through factor accumulation and technological progress and diffusion from the frontier countries (United States and Britain). This section evaluates the factors that have been essential for Australian economic growth and draws on the predictions of recent endogenous growth models. In these models, per capita income levels can be driven up by investment in physical and human capital, healthier workers and increasing labour-force participation rates; however, persistent per capita income growth can only be achieved through investment in R&D and through imports of knowledge, as discussed below.

Capital accumulation

Until recently it has been popular to decompose productivity growth into capital accumulation and, as a residual, technological progress. This method has been used to highlight the central role of capital accumulation as the

source of growth following the predictions of the neoclassical models of economic growth. Capital was given a central role for 19th-century growth by Butlin (1964) and for 20th-century growth by Kaspura and Weldon (1980). However, giving capital accumulation an independent role in growth is not always useful and is potentially misleading because it does not give any indication of the factors that drive the capital accumulation and, as such, does not separate out the part of capital accumulation that is induced by technological progress and that is induced by changes in the propensity to save. Most capital accumulation is driven by technological progress because it increases the returns to capital and, consequently, makes it profitable to invest at given required returns to investment.

Decomposing capital accumulation into capital deepening induced by technological progress and induced by savings, Madsen (2010a) shows that savings-induced capital accumulation influenced Australian economic growth in the post-World War 2 period but not previously. Australia's private savings rate, defined as the fraction of income that is saved, was relatively stable from 1861, when the data became available, until the end of World War 2, suggesting that capital accumulation was driven by technological progress and, therefore, capital cannot be given an independent role for growth before then. The investment ratio climbed to a higher plateau at the end of World War 2 and has remained at this higher level generating higher growth rates in the 1950s and 1960s and, therefore, elevated per capita incomes.

A remaining question is the extent to which livestock investment, a substantial source of capital accumulation in the 19th century, was driven by technological progress. Mechanisation, new fencing methods, and infrastructure development would have expanded the opportunities for making additional investment in livestock financially viable; however, factors independent of new technologies, such as land clearing, probably took place independently of technological progress. This renders it difficult to decompose growth into capital deepening and technological progress during the first part of the 19th century.

Education

Education can influence per capita income growth directly as a factor of production and, indirectly, by advancing the rate of technological progress, raising the efficiency of production, and by increasing the absorptive capacity of a nation, enabling it to catch up to the technological frontier (Madsen 2014a). Figure 2.5 shows educational attainment through the years of schooling of the working-age population, for Australia and the average of OECD countries.

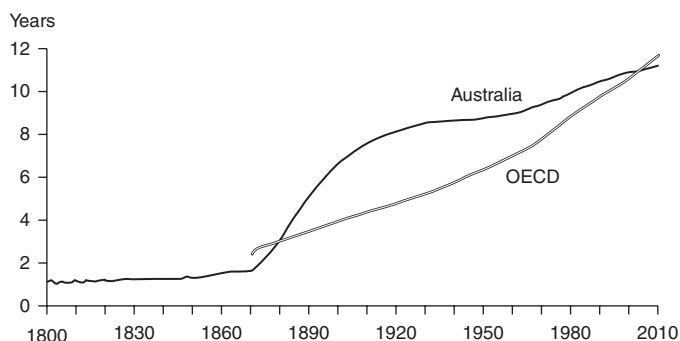


Figure 2.5 Educational attainment, 1800–2010

Notes: Years of education among the working-age population. The OECD countries consist of Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States.

Sources: Madsen (2014a, 2014b).

Educational attainment is based on school enrolment rates accumulated over time and combined with life tables and population age distribution. The pre-1870 Australian data are based on English literacy rates and, as such, may not be representative for Australia. However, the literacy of Australians in the first decades of European settlement was likely to be broadly similar to that of the English population (Meredith and Oxley, this volume).

Figure 2.5 shows that educational attainment increased only slowly until 1870 and, by 1870, was below that of other OECD countries and, therefore, cannot have been responsible for Australia's high per capita income compared to other OECD countries. Australia's educational backwardness did not last long. Educational attainment increased by a huge six years over the period 1870–1910, which is a tremendous achievement compared to the 1.8 years improvement in the OECD on average during the same period. Given the finding that education has contributed to productivity growth in the OECD countries in the period 1770–2011 (Madsen 2014b), the strong increase in attainment must have been a potentially important contributor to economic growth over the same period and may have prevented Australia from experiencing yet slower growth.

Pope and Withers (1995) find that education has played an important positive role for Australia's economic development. They test the influence of human capital for per capita income and growth since 1861 using data for enrolment at primary, secondary and tertiary levels, worker experience, and

a migrant skill index as proxies for human capital over the period 1861–1990. They find health, private investment and human capital to have been influential for economic growth. They conclude that accumulated labour skills were a central feature of the Australian growth story and that growth owes a lot to the skills of immigrants.

Health

Another potential source of the high productivity in Australia during the 19th century, and growth during the 20th, has been good health among the working population compared with other OECD countries. An important factor for the cognitive skills and health in a population is morbidity in utero and during the first years of life (Watkins & Pollitt 1997). Since most of the brain's development occurs from halfway through pregnancy until the child reaches the age of two, this period is by far the most important for cognitive development and health capital in general (Niehaus et al. 2002; Almond & Currie 2011). Madsen (2014a) shows that infant mortality is a strong indicator of infant morbidity and finds cohort infant mortality, as an indicator of health and cognitive skills in adulthood, has been very influential for productivity growth in Australia over the past 140 years. High cognitive skills and good health are decisive for income because the workers are more efficient, more innovative, better at organising work, and better at ensuring prompt and correct deliveries in the production chain. The regressions in Madsen (2014b) and Pope and Withers (1995) show that health has been a highly significant determinant of productivity growth in Australia.

Figure 2.6 shows that infant mortality, as a proxy for morbidity in utero and during infancy, in Australia was well below the average rate of infant mortality in the OECD countries up to the late 1960s. Since infant mortality is a good indicator of health in utero and during the first year of life, the figure suggests that Australians were healthier than their average OECD counterparts during the 19th century and that health in the OECD improved substantially during the 20th century. Australia's comparatively low infant mortality partly explains its high income in the second half of the 19th century. If Australia had an infant mortality of approximately 180 deaths per 1000 live births, as in the average OECD country, instead of 120, it would have been approximately 30 per cent poorer in the second half of the 19th century due to worse health according to the simulations in Madsen (2014b). Furthermore, the larger health improvement in the OECD countries compared to Australia during the 20th century has closed the health gap and may partly explain why Australia's productivity growth during the 20th century was slightly lower than the OECD average.

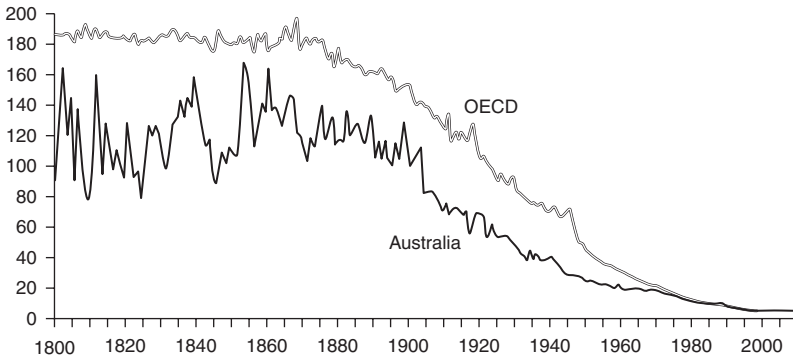


Figure 2.6 Infant mortality rates, 1800–2010

Notes: Infant mortality rates measures deaths up to one year of age per 1000 live births. The data for Australia before 1869 are backdated using crude death rates. The OECD countries are listed in the notes to Figure 2.5.

Source: Madsen (2012).

Innovation-driven growth

Technological progress is ultimately responsible for long-run growth in economic growth models. While a large part of economic development during the 19th century in Australia was a result of structural adjustment, expansion of land utilisation and mining operations, and improved education, a large part of economic growth in the 20th century was technology-induced. Australia could have made technological advances through innovations and imitations of technologies developed at the technology frontiers in the United States and Western Europe. As detailed by Magee (in this volume), Australia has been quite innovative since European settlement. Innovation increased over time along with improved tertiary education and increasing R&D outlays. In endogenous growth models, growth is driven by the enhanced quality and variety of investment goods that improve the efficiency of production. Innovations, in turn, are determined by investment in education and R&D. Several studies have shown that R&D and innovations, in general, have been key drivers of growth for the OECD countries and the Asian Miracle economies (see, for example, Coe & Helpman 1995; Madsen 2007, 2010b; Ang & Madsen 2011).

Only a few studies have examined innovation-driven growth for Australia. Banerjee (2012) has investigated the role of patents for Australian economic growth during the period 1870–2008 and finds that the patenting intensity (patents per capita) has been a significant determinant of labour productivity growth during that period. This result is supported by Madsen (2014b)

who finds that R&D has been a major factor behind Australian productivity advances since 1870. An important finding of these studies is that the innovative activity has permanent productivity growth effects following the Schumpeterian paradigm in endogenous growth models. The key here is that growth is a function of patents per worker (Banerjee 2012) or R&D as a fraction of GDP (Madsen 2013a). Thus, Australian productivity growth should remain approximately around the same level as experienced in the post-World War 2 period in the future as long as the fraction of GDP allocated to R&D and the effectiveness of the R&D remain similar to the post-World War 2 period.

Interaction with the external sector

The most important channels through which economies can interact with each other are trade, investment, and the diffusion of technology. The influence of trade on growth has been widely discussed in the historical context, particularly the role of tariffs. Tariffs are usually counterproductive in trade theory because they increase the cost of intermediate products; however, some economists claim that tariffs were positive for Australia because they ensured that the manufacturing sector could establish itself and create a domestic market for its products (Sinclair 1976). Empirically, it is hard to find any relationship between trade barriers and growth. For the interwar Australian manufacturing sector Thomas (1988) claims that tariffs did not have any strong impact on manufacturing production and played no role in the recovery from the Great Depression. This finding is reinforced by Merrett and Ville (2011) who argue that tariffs did not impact on the manufacturing profitability in the first part of the 20th century. Finally, using long historical data for industrial countries, including Australia, Madsen (2009) fails to find any relationship between productivity growth and trade barriers or trade openness.

Lougheed (1968) speculates that export expansion, induced by external demand, could have stimulated Australian growth through a chain reaction to other sectors of the economy. If Australia had profited from increasing demand for its products, we would expect prices of Australia's principal export products, namely agricultural and mineral products, to increase in real terms. However, the trend in prices of commodities and agricultural products has been downward over the past two centuries (Harvey et al. 2010), suggesting that the export sector could not have been the engine of growth for Australian agricultural and mining products. Furthermore, the analysis of Lougheed (1968) is based on the assumption that growth is demand-driven – an assumption that cannot be maintained unless it is assumed that

technological progress is driven by demand, which, thus far, has not been validated.

Technology spillovers are more likely to have been key channels through which Australia has benefited from the interaction with the external sector. Madsen (2007, 2014a), for example, shows that spillover of knowledge, measured by accumulated patents, through the channel of imports has been a significant contributor to the Australian productivity advances in the period 1870–2010. This is in line with the predictions of the models of Grossman and Helpman (1993) in which foreign knowledge spillovers are transmitted internationally through imports, as imports of investment goods with embodied knowledge enhance the productivity of domestic producers. The significance of the import channel of knowledge spillovers has been particularly important for Australia because products from frontier countries and countries with high growth rates in knowledge stock have had a large share in imports to Australia, and, therefore, contributed to Australia's comparatively high income level over the past two centuries. In a historical context, the majority of imports came from the United Kingdom, with the United States being the second largest source of imports. Thus, Australia has been importing technology from the two technological powerhouses since European settlement. The share of Asian products in Australian imports has risen over the past few decades and Australia has, again, enjoyed trade relationships with the countries in the world with the strongest increase in knowledge, such as the Asian miracle economies.

Deeper determinants of Australian growth

A large body of literature has stressed the importance of institutions for economic development in general and McLean (2013) attributes the absence of a resource curse in Australia to the quality of institutions. He notes that good property rights and the distribution of rents ensured that the economic effects of the resource abundance were positive. Furthermore, McLean (2013) argues that political arrangements in the British Empire ensured that Australia was not exploited but benefited from its participation as an integral component of the British Empire by, for example, having access to the main market for goods and foreign capital. These arguments are supported by Mehlum, Moene and Torvik (2006), who argue that the extent to which institutions are 'grabber friendly' or 'producer friendly' determines whether some resource economies fail while others succeed.

While the high quality of institutions has unquestionably played a role in Australian development, their role cannot be formally tested because the

sample is too small and there are not many identifying variations in the quality of institutions. Recent cross-country estimates, however, fail to find evidence that the quality of institutions has contributed to economic development (see, for important studies, Easterly & Levine 2012 and Gennaioli et al. 2013). The literature is far from reaching an agreement about the relative importance of institutions, human capital, geography or culture for economic development. The settlers from Europe brought human capital, culture and institutions to the New World and it is difficult to assess the relative importance of each these factors for economic development. While the settlers to Australia, Canada, New Zealand and the United States before World War 2 were predominantly from North-West Europe, the settlers in Argentina and Chile were predominantly from Southern Europe. Since North-West Europe, in contrast to Southern Europe, had mostly good institutions, a pro-entrepreneurial culture and a relatively well-educated population, the European settlers to Australia may have brought with them educated people and a pro-business culture in addition to good institutions. Finally, the low-disease environment in Australia in conjunction with easy access to ports has also been a fundamental underlying factor for Australia's early success.

Conclusion

Why Australia prospered so much during the 19th century and rose to become one of the richest countries in the world has long been debated among economic historians. Several attempts have been made to explain why Australia prospered (e.g. Sinclair 1976; McLean 2007, 2013); however, there is a large consensus in the literature that resource abundance such as wool and mining production has been the main factor behind Australia's wealth. Mining was influential for the high per capita income in the second half of the 19th century due its distinctly high level of labour productivity relative to other sectors in the economy and the United Kingdom, positive social overheads, its ability to attract immigrants, and knowledge-related agglomeration effects. The mining boom in the period from the early 1850s was partly responsible for Australia's climb to the top of the world's per capita income scale. Agricultural production was also influential for Australia's early prosperity and the productivity of Australian agriculture exceeded that of Britain in the late 19th century (Broadberry & Irwin 2007). Good health relative to other OECD countries also contributed to Australia's early prosperity through better cognitive development during childhood, better learning and a more productive labour force.

While resource abundance gave Australia a head start in the 19th century, it did not ensure a continuation of growth thereafter. The only way Australia could continue to prosper from its high income base was through technology diffusion, technological progress, and imitation. Australia succeeded in creating a strong economy through innovations, investment in education, and import of knowledge. Domestic and international innovations have been influential for Australian growth since 1870 (earlier data are not available). Domestic research intensity, measured by patents in percentage of employment, has been important for growth and has ensured that Australia's productivity has been maintained at a persistent, positive growth path. Furthermore, Australia has received substantial benefits from international knowledge spillovers through the channel of imports because of its close trade links with the most innovative economies in the world. During the 19th century almost all imports were from the United Kingdom, while imports from the United States grew in importance throughout the first half of the 20th century. The increasing share of imports from the Asian miracle economies since the 1980s has ensured a continuation of the positive spillover effects.

Where might future research directions lead? The factors that were responsible for Australia's prosperity during the 19th century are, at least to some extent, well established. However, how Australia managed to continue to grow after the booms in agriculture and mining faded is an under-researched area. Banerjee (2012) attempts to account for innovation-driven growth and more research has to be done to uncover the influence of human capital, innovations and technology spillovers on Australia's prosperity. Furthermore, comparative studies with other settler economies would give insight into why Australia did not suffer from a resource curse but managed to overcome the obstacles of resource abundance.

Analytical frameworks of Australia's economic history

CHRISTOPHER LLOYD

Introduction

Australian economic history as a branch of social science has had a history of disputation and debate between different approaches. Broad consensus about the main causal forces and explanations of this historical process has been difficult to construct and ideological predispositions have been influential.¹ This is no different from the experience of other countries or disciplines. Economic history has been part of a broader western and later global intellectual development that, while exhibiting some distinctive features of Australia's historical trajectory and economic structure, has evolved in a dynamic context of local and international issues, problems and ideas. As in all social sciences, intellectual frameworks and viewpoints have played a role just as important as problems of describing and explaining the evolving economic reality. The truth of economic history, as with all the social sciences, is not given objectively in reality in some immediate way but has to be conceptualised, discovered, debated and constantly investigated and re-examined in a broadly improving research process. In the 21st century there is good reason to think that convergence between approaches has grown and that a new consensus could be emerging.

In attempting to articulate and criticise the intellectual positions of scholars of Australia's economic history, the first important distinction is that between intellectual frameworks of enquiry, on the one hand, and doctrines of economic development, on the other. Ideally this should be seen as a distinction between scientific enquiry and policy formation. But of course they do overlap because the critique of ideology by any historian requires empirical judgment about historical change and achievement according to a certain

¹ Previous discussions of the methodological and theoretical frameworks of Australian economic history writing have included Schedvin (1979), Haig-Muir (1991), Snooks (1993a, 1993b) and Lloyd (1997).

viewpoint rooted in a framework and model of the developmental process. That is, policy and explanatory frameworks are implicated in each other. But, still, we should try to separate them analytically to help tease out the explanatory strengths of certain approaches and help improve the explanations of economic history that we seek to make.

The global literature on economic history and economic development falls into three broad and somewhat overlapping streams or approaches, depending on their fundamental framework commitments to the primacy of economic, institutional (including political-economic) or socioeconomic nature and causes of economic structure and change. Put another way, these are distinguished from each other by where they find the basic forces determining economic history: in the economy; in politics, institutions and governance; or in social structures and cultures. All three approaches have been employed to explain Australia's economic history and each has undergone a development and refinement as well as some convergence recently.

The nature of the convict and post-convict economy and society as a special formation became a central theme by the 1820s and 1830s as economic development became a reality and has remained a significant theme ever since. The possibilities of an orderly colonialism of free migration and settlement, as a process driven equally by economic and social concerns in industrialising Britain and a desire to build a prosperous society in post-convict Australia in the early 19th century, gave rise to the pivotal theory of 'systematic colonisation' of Edward Gibbon Wakefield in 1829 (1968). The themes of labour shortage and capital importation have resonated ever since. The manner in which such theoretical themes have been framed by methodological commitments is the central topic of this chapter.

The Australian analytical school of economic history

Australian thinkers have made distinctive contributions to economic and economic-historical thinking since the late 19th century (Schedvin 1967, 1979, 1987; Goodwin 1966; Groenewegen & McFarlane 1990). By the early 20th century, it can plausibly be argued (Snooks 1993a), Australia produced a distinctive analytical 'school' of economic history (the three differing frameworks did not diverge until after 1915) that presaged the later emergence of national income accounting and cliometrics (see below). This 'school' had several distinctive features, notably the collection and use of economic statistics; the use, largely implicitly, of the classical economic theory of factors

of production; attention to the role of government; and the adoption of a causal narrative approach to explaining events. Unlike later scholars, these historians were not overtly structuralists in the sense of analysing the evolution of a macroeconomic structure. Events, actions, individuals, decisions and policies were more important.

W. P. Reeves' *State Experiments in Australia and New Zealand* (1923 [1902]) can be read as the first modern work of analytical economic history even though he included an examination of political and governmental developments. Timothy Coghlan's *Labour and Industry in Australia*, published in Oxford in 1918, was the product of a decade's work. It combined a concentration on economic factors and reasoning and extensive use of statistics to describe a long-run process of economic development. But it should be seen primarily as a transitional work between earlier discursive texts and the later, more modern ('objective' or 'scientific') works of orthodox economic historical scholarship for it lacks the technical apparatus of Reeves and of later writers including Shann and Fitzpatrick. Furthermore, the work is far from being just about the economy in an abstract sense for Coghlan wrote extensively about governance in Volume IV of his work, particularly the emergence of the Labor Party up to 1901, the political movement towards Federation, and the developmental role of government policy. As with other works of its time and later in the century, statistics intertwined with and supported the narrative. As would be expected of that era, no econometrical techniques were employed to try to measure causal correlations but such correlations were very often asserted from the tabular data, in the form of relative magnitudes. No explicit theory was employed nor was there a methodological self-consciousness displayed, although more than once Coghlan described the work as a 'chronicle'. By this he seems to have meant that he wished to be entirely factual and to describe an unfolding story. Nevertheless, his sympathy towards the working class and organised labour and extensive narrative on the Labor Party and social legislation in Volume IV and his earlier work suggest a particular political orientation that he described in a pseudonymous *Bulletin* article of 1889 as that of 'the just reasoner'. By this he meant that instinct should be replaced by reason in politics and public policy. A statistical basis was necessary for reason to triumph (Maddison 1999; see also Holton 1987). This idea became more widespread as the 20th century progressed.

The complete absence of referencing to or quoting of sources in Coghlan's book, a potential concern he dismissed in the Preface, contrasts with Reeves and is exceptional by the standards of the time of British and

Australian scholarship. His statistical basis came from his extensive work over many decades in New South Wales and that of the statisticians of all the colonies. A chief interest of the work, in the context of the present chapter, lies in its place in the development of the national-income accounting approach to economic history (Arndt 1949; Haig 2006), which came further to the fore in the 1930s and the 1940s in both Australia and the United States (see below).

Coghlan's work and that of his contemporaries should be viewed in the light of trends in economic enquiry in Britain and Germany from the early 19th century. The explicit study of economic history became increasingly important in Europe as the 19th century progressed and industrialisation spread to more regions. The German Historical and Nationalist School of Economics from the 1840s and then the English Historical School of Economics from the 1870s (including Toynbee's canonical conceptualisation of the industrial revolution (Koot 1987; Kadish 1989)) were important opponents of the abstract and ahistorical economics of the English Classical School of Economics stemming from Adam Smith.

When the first analytical economic histories of Australia began to be written it was the older British historicist and evolutionist influences that were most influential. And when heterodox (radical social and political) ideas began to gain ground from World War 1, German influences came to the fore. In addition, the strong statistical tradition, which Coghlan had pioneered, also proved influential. The works of economic history of the 1915–30s era (the 'Analytical School'), by Coghlan, Mills, Heaton, Atkinson, Benham, Roberts, Shann, Hancock, Portus and Fitzpatrick, reflect this quantificatory emphasis. But the distinctions between economics, history and economic history were not significant and the early generation of economic history scholars moved freely between these subfields and even into English literature. Indeed, good narrative writing was prized in this form of what was later labelled 'old economic history'. In addition to the causal narrative mode of presentation and argument, these writers shared a strong interest in the policy/political issues of their era, on which the main divisions in methodology and theory began to open by World War 1.

R. C. Mills, professor of economics at the University of Sydney from 1922 (Groenewegen 1986), had examined Wakefield's theory and the consequent history of Australian colonisation of 1829–42 in his LSE doctoral thesis (Mills 1915), which was a pioneering work of economic history, predating Coghlan's *Labour and Industry* but with a far smaller scope. Around the same time, the growth of university extension tutorial studies for part-time

students (mostly working class men who could not afford to attend as regular students) at Australian universities and the closely associated WEA (founded in Australia 1913 and still existing), an offshoot of the older British organisation, was the institutional location of teaching and writing about economic history. Significant contributions by Meredith Atkinson, C. H. Northcott, Herbert Heaton and G. V. Portus were produced under this umbrella but not on the whole conforming to the emerging orthodox economic methodology, being rather more interested in the social development of Australia than the economists. Herbert Heaton's *Modern Economic History with Special Reference to Australia* (1921), written for a generalist audience and lacking scholarly apparatus, was probably the first book published in Australia with 'economic history' in the title. These writers did not share the laissez faire outlook of the orthodox economists such as Mills. One who did was Frederic Benham; recruited from London by Mills in 1923, he was active in examining the effects of protectionism and advocating laissez faire in his historically framed *The Prosperity of Australia: An Economic Analysis* (1928), based on national income measurement. But he departed Australia in 1929 just as the debate was heating up. In the same year S. H. Roberts took up the Challis Professorship of History at Sydney University. He had already published his Melbourne masters thesis as *History of Australian Land Settlement 1788–1920* (1924), the first major work of economic history in Australia after Coghlan's, and later followed it with *The Squatting Age in Australia, 1835–1847* (1935). While Roberts' books were certainly works of historical economic and geographical description and analysis, they were not as fully formed modern economic histories as those of contemporaries Edward Shann, H. K. Hancock and Brian Fitzpatrick. Shann's *An Economic History of Australia* (1930) was the first thorough history of economic events, decisions, actions and processes that spanned the whole period from foundation of British settlement until the late 1920s. Hancock's *Australia* (1930), employing the same narrative-based approach, went beyond economic history to incorporate political economy, politics and civilisation. The most developed and technically proficient of the three contributions were Fitzpatrick's two volumes: *British Imperialism and Australia 1783–1833: A Economic History of Australasia* (1939) and *The British Empire in Australia: An Economic History, 1834–1939* (1941). All four books are excellent examples of 'old' economic history in the Australian analytical tradition, in that narrative, events, individuals and government policy are all central. The authors expressed strong opinions with a flourish. The overlap in methodology with general history is obvious; being explicitly works of economic history does mean they have a different approach from other branches

of history writing. Quantitative data are used throughout but the economy is not conceptualised in an abstract way and economic theory is not explicitly employed. These four books were products of the historicist tradition. All of this was to change in the postwar decades as the methodological divergence between orthodox (economic) and heterodox (socio-political) approaches became significant.

The writings of the Australian analytical school were not works of applied theory but there were three senses in which theory did play an important role. First was the inheritance of classical economics and its concern with markets and *laissez faire*. Here, theory took the form of concepts and arguments about the three great economic ‘factors’ of land, labour and capital and their interconnection. Even further in the background was an assumption about human motivation as being essentially acquisitive and rational-individualistic, which came ultimately from classical political economy. While the economy was a realm to be studied for its own dynamics and causal structure, government policy was seen as interventionist for better or worse. Second was the important work in national income and growth being produced in 1930s Australasia by Allan G. B. Fisher and Colin Clark. Fisher and Clark were pioneers of comparative national income research, particularly the theory of structural change from primary to secondary to tertiary sectors (Fisher 1935; Clark 1940; Clark & Crawford 1938; see also Maddison 2004). Third, and in contrast with the other kinds of theory, was the radical tradition of socio-political theory of capitalism, which began to become influential in explaining Australia’s economic history in the 1920s and 1930s. The central theme was about the role of the state in ameliorating the disparities of wealth and power and the promotion of social as well as economic development.

Indeed, it was over this basic question of the role of the state that the divergence between the first two intellectual frameworks began to appear in the 1920s. The doctrinal contrast between the market liberals Shann and Hancock, on the one hand, and Fitzpatrick, the social democratic and nationalist critic of the colonial state as facilitator of British capital accumulation, on the other, was clear. The relationship of Australian economy and society to the Empire had become a major issue during World War I and the associated issues of debt and trade dependence on Britain came strongly to the fore, especially during the Great Depression of the 1930s. The contentious intersection of economic understanding, economic policy, and socio-political ideology resulted subsequently in a division in approaches to explaining Australia’s economic history.

The maturity of orthodox economic history

The years immediately following World War 2 marked a watershed in Australia's economic development, as in the rest of the advanced capitalist world. The macroeconomic prosperity of the war economy years and the strong government commitment to maintain full employment after the war resulted in the continuation and extension of the labourist-protectionist regime of Australian economic regulation that had been instituted in the first two decades of the century.² What in retrospect became 'the golden age of the western state', in great contrast to the *laissez faire* ideology of the 1920s and 1930s, had a local iteration in Australia, at first under the Curtin–Chifley Labor government until 1949 and was more or less continued by the Menzies Liberal–Country Party government into the 1960s. Labourist protectionism had been much argued about in the late 1920s and early 1930s and was one of the causes of the division among both economic historians and economists in the 1930s over the role of the state. Australian economists were always centrally interested in growth and development theories and their intrinsic links to government policy, as revealed especially in the late 1920s and 1930s depression years. But during and after the war, the influence of Keynesian interventionist demand-management theory in economics and policy became pervasive and a central component of economic orthodoxy in the postwar years worldwide. Full employment was the chief policy target.

The global context of Cold War and emergence of new states out of old empires was also a new stimulus to economic growth and development theory as well as economic planning. Here one of the most important thinkers was Simon Kuznets in the 1940s–1970s era (Kuznets 1966). Kuznets made several very influential contributions to economics, namely the importance of precise categorisation and measurement of national income accounts over time, the centrality of statistics to that task, the mathematisation of causal theory and explanation, and the theory of modern economic growth. Being American was essential to his worldwide influence but he didn't recognise the extent to which the Australian analytical scholars of the interwar years (especially Clark (1940), Fisher (1935, 1939),

2 Labourist-protectionism was the policy regime instituted in the early 20th century by Deakener Liberals and Labor that consolidated centralised industrial arbitration of disputes and wage setting, supported the new protectionism that combined wage and job protection with implicit guarantee of industrial profitability, and organised agricultural marketing. Compare Lloyd (2002).

Clark and Crawford (1938), Benham (1928) and looking back to Coghlan) had pioneered much of this agenda, which, combined with the Keynes–Samuelson synthesis from the 1940s and 1950s, became the core of orthodox ‘scientific’ economics.

In Australia the maturation of the orthodox approach to economic history was a natural outgrowth from the earlier era’s interests in the use of statistics combined with a causal narrative presentation and also sectoral development theory, the latter strongly influenced by Fisher and Clark and now allied with Kuznetsian national income accounting and growth theory. The central figure in this maturation and the most influential figure in the postwar generation of economic historians was Noel Butlin, who was joined by many other able economic historians in the quest for precise, ‘objective’ explanations of Australia’s developmental history. This approach built on the firm foundation of statistical data that had characterised economic history from the beginning of the century, and Butlin set out to marshal a vast amount of new data within the framework of the national income accounting approach pioneered by Fisher, Clark, Crawford and Kuznets. Butlin’s *Investment in Australian Economic Development* (1964), which was the outcome of a decade’s work, had great precision and thoroughness; it focused on capital formation and investment as the key macroeconomic variable of economic development, as orthodox economics understood very well. Unlike the earlier work of Shann, Hancock and Fitzpatrick, individuals and events are not part of the account. This is a work of aggregate economic analysis over time and as such represents the new, mature form of economic historical scholarship. The same can be seen in other works from the 1950s onwards, such as those by Max Hartwell, Sydney Butlin, E. A. Boehm, W. A. Sinclair, Colin Forster, R. V. Jackson, C. B. Schedvin, Rodney Maddock, Ian McLean, G. J. Abbott and N. B. Nairn. While not being works of applied economics or econometrics (new economic history or cliometrics), neither were they forms of ‘old’ economic history. The quantification (or cliometrics) revolution spread to all economic history writing from the 1960s and to many other areas of historical scholarship. The new economic history (especially in the United States) combined the most advanced form of quantification (econometrics) with neoclassical economic theory and so became a form of applied economics. This did not happen in Australia to any significant extent, although quantification and economic theory became more explicit, particularly growth theory and capital theory. The interconnection between economic historians, economic theorists of development and policy theorists was now close but economic history retained its autonomy.

The 'orthodox' institutional turn

A concern with institutions has always been important to economic historians, as we have seen. But the neoclassical synthesis of economics largely ignored institutions in favour of a concentration on the microeconomics of market behaviour. Then, in the 1970s, the institutionalist turn in orthodox economics represented a rediscovery of certain 'rules of the game' in market societies, especially the importance of property rights, collective behaviour, and rent seeking. The aim by neoclassical economists was to try to eliminate distortionary impediments to the freedom and efficiency of markets by examining and criticising the institutional framing of market decisions and behaviour. The institutions that came under scrutiny were essentially those centred on the state's formal regulatory agencies and the state's interventions in markets via government business enterprises, which had always been a major component of the Australian economy.

In the 1960s this critique was made much more rigorous by the use of public choice theory, which analysed the functional and redistributive role of states and coalitions. Economic theory of free markets was applied to governance, especially to criticise rent seeking, monopolies and market distortions. Noel Butlin, Alan Barnard and Jonathan Pincus (1982) led the way, building on the older critique of colonial socialism. The assumptions of rational choice and methodological individualism, so central to neoclassical economics, underlay the approach. Public choice theory became very influential, as the foundation of a wider neoliberal ideological critique of the state, and was instrumental, it could be argued, in the so-called neoliberal policy revolution taking place in the 1980s (see Schwartz 1994).

Heterodox streams: political and social perspectives

Radical liberal and socialist political and economic writers and activists, associated with the labour and liberal movements that began in the 1890s, became influential in the early 20th century, especially in the context of conflicts over involvement in World War I and its effects on the working class. These radical intellectuals were interested in how Australia's economic development formed the context for social development. As mentioned previously, many of them occupied positions as organisers and teachers of the tutorial system in universities. They delivered the first offerings of economic history and were closely associated with the WEA, under the auspices of which their books were issued. Clarence Northcott (1918), Meredith Atkinson (1919,

1920), J. T. Sutcliffe (1921), G. V. Portus (1921) and Herbert Heaton (1921) all published books on economic and social issues from 1918 through to the early 1920s (Bourke 1981, 1988; Haeusler 1996). Portus' book *Marx and Modern Thought* (1921) was the first articulation in Australia of Marxism in a considered, scholarly form. Of course there were thinkers and writers influenced by Marxism before that (including V. Gordon Childe) but after Portus the influence of Marxist thinking grew, even if it was not able to find a home in universities because of censorship and exclusion.

Marxism was just one intellectual influence in the early 20th-century radical milieu of ideas and writing as Reeves' book and the WEA texts reveal. The seminal works of Fitzpatrick, which were heterodox but not strongly Marxist, had a central emphasis on social class and capitalist power. Indeed, Marxism, and socialist thinking more generally, has always been read in Australia through the lens of radical nationalism. It was not until the 1960s and 1970s that a significant Marxist school of writing about Australia's political economy and economic history emerged (Groenewegen 1979). The thrust of the approach was to conceive of the economy as a system of production and social class relations that structured the relationships between capital, labour and the state. The task was to examine the dynamics of capitalist economic development and its cyclical nature as an institutionalised system of power. For Marxists, material interests are the fundamental determinant of class interests, so economic class analysis or, more accurately, political economy of a post-classical kind, was the way to analyse the process of economic development. The leading contributors to the Marxist examination of Australian economic history have been among the many contributors to E. L. Wheelwright and K. D. Buckley's five volumes of *Essays on the Political Economy of Australian Capitalism* (1975–83), as well as Bruce McFarlane (1972), Ken Buckley and Ted Wheelwright (1988, 1998), Philip McMichael (1984) and Andrew Wells (1989).

The extent to which orthodox and radical interpretations of Australian economic history were mutually incomprehensible to one another was revealed by a disappointing (in retrospect) debate that occurred in the journal *Labour History* in 1975–76 between Graeme Snooks (1975a, 1975b), Tim Rowse (1975), David Clark (1976) and Bruce McFarlane (1976). The key issue was whether radical interpretations were vitiated by use of orthodox research findings, particularly Noel Butlin's work. The debate reflected the gulf between the approaches but it was not sufficiently understood that alternative approaches do not rest upon different empirical findings. The differentiation between orthodox and radical approaches is essentially ontological:

their presuppositions about the structural reality of economies and societies, and therefore their general conceptualisations of the relationship of economic behaviour to social and political structures and power, are different. Empirical arguments about the causal determinants of economic history will therefore diverge but their overall descriptions of the processes and outcomes could be similar.

Further extensions of the political economy approach, inspired to a greater or lesser extent by Marxism, have been made by those who have seen Australia in a world context, in the way that Fitzpatrick did. Here the theme has been the history and evolution of Australia's political economy as a settler society in a world of capitalist expansion in the 19th century. Philip McMichael (1984), Donald Denoon (1983), Christopher Lloyd (1998), James Belich (2009) and chapters in Lloyd, Metzger and Sutch (2013) have all contributed to this global comparative political economy perspective.

In addition to Marxism, there have been other socio-political approaches to explaining Australia's economic history. The most influential has been Louis Hartz's (1964) fragments theory, which seeks the fundamental determinant of economic development in the differing cultural/ideological formation of the neo-European 'fragments' or settler societies since the 16th century. Here societies are conceived, in the American liberal/idealist tradition, as embodying a fundamental idea. This is the opposite of Marxism and other historical materialist or economic interpretations of history. Although the Hartzian theory was certainly able to be used to try to explain economic history, its reception in Australia met with skepticism (Martin 1973; Hirst 1984).

Theorising Australian economic history

The foregoing discussion of frameworks sought to articulate the three broad suppositional approaches to writing the history of the Australian economy. These are neither theories nor explanations, although they do influence the types of theories that are developed and employed. While there is some agreement among all scholars about the key problems, processes and trajectories of Australian development that need explanation, the different approaches led to divergences of theories and explanations. Thus, there have been many attempts to conceptualise and explain in a general theoretical way the structural evolution and causal forces of the history of the Australian economy since British colonisation. The history of concepts and models can be interpreted as revealing the development of the discipline of economic history as both a separate branch of social science and as intersecting with

other branches. The divorce between economics and history from the early 20th century meant that the perspective of economic historians on the very issue that economics was concerned with – economic development – was different. Moreover, as Arndt (1981) pointed out, economic development in Australia was something that had to be fostered rather than happening spontaneously, which implied that economic policy was always at the forefront of economic thinking. Policy requires a good conceptual and empirical understanding of the structure and processes of the economy in order to have the desired effect. The concepts of development employed by economic historians were therefore derived from empirical observation and policy concerns more than from abstract economic theory.

Labour supply

The problem of labour supply, scarcity, and skill or education has been a central theme throughout Australia's economic history. All the settler societies of the 19th century, being rapidly growing capitalist regions of resource abundance and labour scarcity, were strongly influenced by the problem of labour supply, its various solutions and its effects on politics, none more so than Australia because of the problem of distance from Europe (Lloyd 2013). The settler societies, by the nature of their capitalist formation in the 18th and 19th centuries and through their historical devastation of indigenous people, in contrast with tropical slave and peasant colonies, had a great thirst for labour importation. The first attempt to think systematically and conceptually about the labour supply and economic developmental process in Australia came from Wakefield who was influenced by and a member of the emerging current of Benthamite philosophic radicalism, centring on the work of James and John Stuart Mill and including the ideas of Charles Buller, Lord Durham, Sir William Molesworth and others (Semmel 1961; Attard 2013). The thrust of their thinking about colonisation was derived from a political economy perspective about the transfer of capital and labour from the source country to the new 'empty' lands in order to promote capitalist expansion at home and abroad and improve the rate of return on British capital. Wakefield's theory rested upon an understanding of the necessary social structural conditions for capitalist/bourgeois society to prosper, which in turn reflected the early 19th-century utilitarian and liberal view of the necessary triumph of capitalism and democracy over the old order of privilege and corruption. Wakefield's systematic colonisation concept was a policy for attracting immigrants to the empty lands by controlling the availability and price of land to ensure an ordered class society of landowners and workers;

at the same time immigration would solve problems of overproduction and idle capital in Britain and the weakness of capitalist accumulation in the colonies where everyone wished to be a capitalist and so there were insufficient wage workers. Creating a landless working class was the aim. Thus Wakefield's theory had a relational understanding of capitalism. Karl Marx extended this view into a more fully developed theory of capitalist political economy and recognised Wakefield's contribution, who he described as the 'most notable political economist of that period' (Marx 1867, p. 667). He wrote that Wakefield had discovered that 'capital is not a thing, but a social relation between persons, established by the instrumentality of things'. Thus the flourishing of capitalism required a class of wage labourers to work for the class of capitalists in order for capital to go on accumulating. In the colonies, as well as in the United States, as both Wakefield and Marx understood, this supply of labour was deficient and had to be remedied. This was a view shared by the Colonial Office and New South Wales and Van Diemen's Land administrations by the 1830s and was implemented in New South Wales, South Australia and New Zealand under Wakefieldian influence.

The labour supply problem re-emerged with the gold rushes of the 1850s, as Mayes (1860) understood, and assisted immigration continued. The end of the gold boom shifted the problem to one of urban employment, which led to the protectionist system and the emergence by the turn of the century of the impetus for labourist protectionism, which survived the Great Depression and was reinvigorated by the World War 2 and the postwar Keynesian emphasis on full employment. By the 1960s it became clear, thanks to economic historical analysis, that the immigration system was a fundamental driver of Australia's economic development experience (Boehm 1971a, 1971b; Pope & Alston 1989).

Land and natural resources

Wakefield's theory of colonisation was also premised on the availability of vacant frontier crown land in colonies of new settlement. His classical political economy idealisation of capitalism required the free availability of all the factors of production – land, labour and capital – in an institutional context of law and markets devoid of the class and monopolistic restrictions of the Old World. The idea of settlement and settlers went together with the idea of development and together they formed a doctrine of staple extraction and staple-led (commodity) export development as the emergent route to prosperity for such colonies. The proponents of what was, in effect, staple-based commodity development in the 19th century, from Wakefield onwards

(Cowen & Shenton 1996), proposed an interpretive theory for understanding Australian economic history (and other similar regions of recent settlement) that has remained a powerful framework (Watkins 1963; McCarty 1964; Abbott 1965; Hirst 1984). Part of the power of this interconnected set of concepts has been the way in which they have been reinterpreted, amended, and linked to similar theories and concepts, particularly linkage theory, unbalanced growth theory, and resource curse/blessing theory (Hirschman 1958; Krugman 1991, 1994). A leading example has been Sinclair's (1976) neo-staple 'model' for explaining Australian economic history in terms of the flow of factors from Britain to Australia and in reverse (see below). All these concepts have been designed to grasp the developmental historical process as one dominated by primary resource extraction and exports under conditions of factor mobility and world market volatility. As such they have been essentially classical and neoclassical in their foundations as material, economic approaches to explaining Australia's economic history, and have provided a critical and somewhat negative appraisal of the developmental process as unbalanced, precarious and overly dependent on a continuing 19th-century trade profile. Linked to this critique has been the (often implicit) idea of a dysfunctional institutional framework of a socialistic labour-state nexus that has limited Australia's potential, leading to a partial resource curse phenomenon (Gregory 1976; Corden 1997) that has limited Australia's potential as a market society. Resource curse theory has roots in staple theory and is related to the small, open economy model developed in the 1970s by Sinclair and others (see below).

Orthodox institutionalism – critiques of the state

Noel Butlin's (1959) concept of 'colonial socialism' attempted to bring institutional political economy further into the centre of analysis, a perspective implicit in much older writing about Australia's history but one lacking conceptualisation. The theme of the role of the state has always been central in economic historical writing for, indeed, Australia was founded as a state enterprise and governments continued to play a leading role in the economy and society throughout the era until the Great Depression at least and arguably until the 1980s in the Keynesian era.

The institutionalist 'revolution' in economics and economic history that began in the 1970s with the work of North (1990) and others has influenced the worldwide broad tradition of orthodox economics and political economy, as well as economic history. In Australia this stream of work has resulted in significant historical writings, beginning with Butlin, Barnard and Pincus

(1982) and more recently including Brennan and Castles (2002). Furthermore, Australia has had a long and rich history of institutional and business historical writing, going back to the 1930s. Of central interest in the early decades was the history of banks and their fundamental economic role and then the history of mining and manufacturing corporations and the sectors in which they operated. Business history has now become a major component of the economic history profession in Australia, including studies of business sectors and the role of big business, such as by Ville (2000) and Fleming, Merrett and Ville (2004). Throughout this tradition, a chief concern has been to investigate the centrality of business models, business developments, and intercorporate structures to macroeconomic history. That is, the perspective of businesses and firms has been the lens through which the economic history of Australia has been examined. This development reflects in part the new emphasis on business history in other countries. In addition to this has been the examination of public institutions; among numerous works have been histories of the Reserve Bank (Giblin 1951; Schedvin 1992; Cornish 2010) and the Treasury (Whitwell 1986).

Small, open economy model

The international context of Australia's economic history was naturally a central issue from the very beginning of thinking about the determinants of growth and development. The tyranny of distance exercised the minds of Wakefield and the colonial reformer William Charles Wentworth and underlay the protectionist impulse from the 1860s. Even though Australian development was crucially interconnected with the emerging world economy from the early 19th century as staple commodity exports became significant and imports of labour and capital were crucial, a detailed theoretical conceptualisation of this world economy context of Australia, using neoclassical economic theory, was not made until the 1970s. W. A. Sinclair's (1976) model of Australia as a small open economy has been the pioneering work. Sinclair developed a neo-staple model reminiscent of von Thünen's (2009 [1826]) spatial theory of economic development, in which investment, production and technology vary in concentric circles around a central marketplace, depending on the availability and quality of land, capital and transport, which are all constraints. The small, open economy model can be seen as an updating of the staple theory of economic development (Altman 2004), which combined an interest in economic development theory (such as Albert Hirschman's work) with an older argument pioneered by Harold Innis (1930) in Canada and harking back to classical political economy, including Wakefield's work.

Heterodox institutionalism

As discussed previously, the divergence between economic and socio-political approaches to explaining Australia's economic history began to open in the 1920s over differences about the role of the state and the significance of social class power and social inequality. The 1890s depression, the emergence of the labour and socialist movements as central political forces, the rise of the Labor Party to provide the world's earliest working class governments, and the bitter conflicts over Great War involvement with its economic and social consequences were all catalysts for the diversification of social and economic thinking.

Beginning in the 1890s, the alliance of social liberals and labour succeeded by 1913 in putting in place a regime of economy and society in which state-established institutions that directly regulated or publicly influenced the labour and finance markets and the development of manufacturing were central to the developmental state strategy. This so-called Australian Settlement has been argued about ever since by both market liberals and state socialists as being either too powerful or not powerful enough. Radical critics from the left (such as Fitzpatrick) have always seen Australia as rooted in a 'colonial dependency', from which it has struggled to free itself (Cochrane 1980).

On the other hand, orthodox economic historians, including Butlin (1970) and most recently McLean (2013) have pointed to the poor economic performance of Australia in the 1890–1940 half-century and have tended to follow the Fisher (1935) argument that the clash of progress and security resulted in a preference or social choice for security and equality over development in that era.

The concept of settler colonialism was present in an undeveloped form from Wakefield's time and was a component of Fitzpatrick's approach, Hartz's theory of fragments and McMichael's world systems approach, but was not given a full expression until Denoon's (1983) comparative work and formulation. The comparative characteristics of settler economies of the 19th century have more recently been explored in much greater detail in Belich (2009) and Lloyd, Metzger, and Sutch (2013). The concept of 'settler capitalism' has perhaps become essential but its specification varies according to the more basic approach being adopted, such as McLean's (2013) new orthodox synthesis compared with Denoon's (1983) older relations-of-production approach, Belich's (2009) world history approach and Lloyd's (2013) materialist-institutionalist approach. These all share the idea that the settler economies of the late 18th to early 20th centuries developed through a system

of land abundance, capital imports, labour imports, and commodity exports to the expanding world market. This commodity-intensive route is the third main driver of economic development of recent centuries, in addition to the capital-intensive route of the North Atlantic region and the labour-intensive route of East Asia.

The role of Indigenous history

Belated but necessary recognition of Aboriginal and Torres Strait Islander history and its complex intersection with settler colonialism has come to the fore in the past decade or so and the literature on the settlement process is being recast. Fortunately, the conceptualisation of Australian history can no longer accept what now seems the breathtakingly ignorant statement in 1959 (but representative of its time) by J. A. La Nauze, when reviewing the development of Australian history writing since 1929, that ‘even among countries of modern European settlement we are peculiar in having no real experience of formidable opposition by the native inhabitants ... The occupation of an empty continent without opposition is unique’ (La Nauze 1959, p. 11). Much work is now being done within the framework of settler–Indigenous economic history to correct this old erroneous and supremacist view and to show how the settler process of conquest and colonisation unfolded in the face of Indigenous opposition, incorporation and hybridisation. (See Altman 2004; Altman & Hinkson 2010; Altman and Biddle, this volume; Keen 2010; Lloyd 2012; Fijn, Keen, Lloyd & Pickering 2012.) The formation of the Australian economy and society cannot fully be understood except as a process of dynamic, constantly changing hybridisation. The emergence of a distinctive society and economy in the early 19th century and its subsequent historical trajectory owes something to both the European settler process and the natural and Indigenous societal context in which the history occurred. The very landscape into which the settlers invaded and exploited was itself the product of Indigenous humanisation over millennia.

Towards methodological convergence

Once modern orthodox economic-history writing became established in the post–World War 2 decades and then socio-political institutionalism began to undermine its narrowly economistic thinking in subsequent decades, convergence between approaches and theories became possible. The sharp divisions between orthodox economistic and radical socio-political approaches and explanations of the 1960s–1980s era have largely eroded. The sharper

division between econometric-based approaches and the broader historical institutional approaches that is still evident in the United States and to some extent in other places is not so evident in Australia where economic historical scholarship has had greater institutional and intellectual autonomy from economics.³ A viewing of books and articles on Australia's economic history (including business history) published in recent decades confirms that the discipline in Australia is still a branch of historical enquiry more than of applied economics. Recent general economic histories by Dyster and Meredith (2012) and McLean (2013) show that the sharp contrast between old and new economic history methodologies that opened such a gulf in the United States in the 1950s and 1960s did not become salient in Australia. The old causal narrative story of events and actions certainly gave way to the analytical and macroeconomic approach and the radical structuralist approach but quantitative reductionism and the use of historical data as a testing ground for theory, through which economic history became a branch of applied economics, did not capture the discipline in Australia. Explaining the actual, historical, complex processes of what happened, and why the Australian economy today is the way it is, remains the motivation of Australian economic historians.

3 See the recent debate about American versus European economic history methodology and ideology in *Investigaciones de Historia Económica*, 9: issues 2 and 3, 2013.

PART 2



TRANSITION

The Aboriginal legacy

BOYD HUNTER

Introduction

Aboriginal people are largely ignored in conventional economic history of early colonial Australia.¹ Indeed, the earlier economic histories make no direct reference to Aboriginal people. Sinclair (1976, p. 1) confidently wrote:

Australia was a country where 'land was abundant and economic development took the form of European penetration ... the technical knowledge of the existing inhabitants was much more primitive than that of the Europeans and the existing social order was not transformed so much as replaced by an alien culture.

One excuse for this blind spot in Australia's economic history is the lack of an Aboriginal voice in many written historical records. Even where recent economic histories include a discussion of the Aboriginal contribution to Australia's economy, it is implicitly discounted by a focus on prosperity and economic growth (McLean 2013, pp. 38–44). McLean briefly discusses depopulation of the original Indigenous population through disease and frontier violence, but discounts Aboriginal contribution to Australia's prosperity as there was no reproducible capital for the colonists to appropriate, while fire-stick farming is argued to have had only a temporary effect. McLean makes the case that the main Aboriginal contribution is through the provision of labour, although the qualitative evidence of this contribution is fragmentary and specific to a region or industry (2013, p. 43).

White (1992) criticises the notion that pre-contact Aboriginal people made a conscious choice to remain hunters and gatherers, because these people did not have perfect knowledge about prospective levels of risk under a different

¹ The focus in this chapter excludes Torres Strait Islanders who are a relatively small part of the Indigenous Australian population and have a distinct culture and history that merit study in their own right. For further information, see Mullins (1994).

economic system. Aboriginal risk management may have been carried out at the cost of growth promotion, but the environmental challenges facing Aboriginal people were very substantial. This chapter builds on McLean and White by describing key economic features of the Aboriginal economy while dispelling some myths about the lack of resource management, capital investment, or task specialisation.

Noel Butlin (1983a, 1993) radically altered the debate about the pre-colonial Aboriginal population size and brought both economic and demographic techniques to understanding of whole Australian economy in the late 18th and early 19th centuries. This chapter revisits Butlin's analysis in the context of more recent literature.

Butlin argues that it is not possible to understand the transitional economic history of Australia in the early colonial period without understanding the relative size of the Aboriginal and colonial populations and economies (1983, pp. xi–xii). Butlin's main contribution was not as a straightforward history; rather it is a set of plausible scenarios that are grounded in theoretical models of economic and human ecological considerations and are broadly consistent with what we know about the historical record.

In order to understand the legacy and contribution of Aboriginal people to the transitional Australian economy up to 1850, we first need to understand the nature of the hunting and gathering processes that supported these people for 50 000 years or more. One core economic issue is how Aboriginal people deal with scarcity, but this chapter also addresses production, allocation and distribution. Butlin emphasised scepticism about the historical record as no colonist ever 'saw' Aboriginal people in 'their pre-contact conditions' because of the long-range effect of smallpox and other diseases (1983, p. 175). In a sense, the main subject of this chapter is the economic prehistory of Aboriginal Australia in the early colonial period.

It also describes the first contact between Aboriginal people and the outside world. While such contact did involve some positive aspects, including cultural and economic exchange with the Macassans of Indonesia and Papua New Guineans, the spread of disease and frontier conflict and the contestation over the possession of the land had catastrophic consequences for the initial inhabitants of this continent. Following the lead of Butlin, the costs of first contact and colonisation are summarised by reference to the large-scale depopulation and the relative productivity of Aboriginal and colonial economies to 1850. The Aboriginal legacy is largely evident today through surviving Indigenous knowledge retained in the growing population of Indigenous Australians.

Economic prehistory of Australia

Pre-contact Aboriginal life was fundamentally different from modern-day Australian society. Furthermore, there has been a profound loss of cultural and economic institutions that is almost impossible for outsiders to fully comprehend. This section briefly introduces some debates about pre-contact people so that we can begin to appreciate both the Aboriginal legacy and what has been lost.

The original affluent society?

In *Stone Age Economics*, Marshall Sahlins (1972, p. 1) describes hunter-gatherer societies as the 'original affluent society' where material wants are easily satisfied because their social organisation constrains demand (in contrast to capitalist societies).

Sahlin's claims are partially based on data from the 1948 American Australian Scientific Expedition to Arnhem land (1972, pp. 8–15). The food-collection activities were shared relatively equally and residents spent around five hours per day collecting food. Altman (1984) contests Sahlin's depiction of Arnhemlanders as he demonstrates considerable work effort was required to meet subsistence requirements under traditional conditions.

The assertions about the original affluent society might be contestable, but the overall level of productivity in the pre-contact Aboriginal society is likely to compare favourably with that of the early colonists in Port Jackson, who struggled to establish stable food supplies and farms in an alien environment.

Hunter-gatherers focus on domestic production for families and kinship groups. There is a systematic tendency to underproduction and an ongoing trade-off between a relatively low standard of living and leisure (Sahlins 1972, p. 41). While hunter-gatherers may have been affluent compared to the early colonist who did not have the technology or knowledge to deal with the new environment, they may have been underproducing relative to hypothetical farmers who had suitable skills and knowledge and some capital to invest in Australian land to make it produce more resources.

This tendency to underproduction is important in that it is the dominant production modes that define what is the maximum population that can be carried on a particular patch of ground. This notion is sometimes referred to as the carrying capacity of the land, which is determined by both ecological considerations (e.g. natural productivity) and the organisation of the

economy (which includes the availability of capital, technological innovation and the transmission of knowledge).

Sahlins (1972, p. 98) also argues that hunting and gathering modes of production are discontinuous in both time (in seasonal influences) and space. However, the domestic mode of Aboriginal production can be intensified over the long run as technology is invented or changes as it is disseminated across the continent. The process of intensification may feel familiar to economic historians as it is describing an 'institutional' arrangement whereby productivity is enhanced by social investment. Accordingly, the notion of carrying capacity of the land described above is not predetermined by ecological considerations, but human agency clearly has an important role in improving local productivity.

Sahlins can be read as asserting that hunter-gatherers solve the problem of scarcity by moderating their demands relative to the supply of resources and goods (Butlin 1983a). However, this is wrong as scarcity clearly manifested itself at various times during the dramatic environmental and ecological shifts, not least of which being the ice ages and the mass extinction events (Flannery 1994).

A characterisation of the pre-contact hunter-gatherer economy

Most hunter-gatherers have two strategies to adapt to the irregularities of natural food supplies (Dingle 1988, pp. 5–6): First, they tend to live in small groups thinly spread across the land. Second, they move regularly but not necessarily travelling all that far. The economic rationale is that the longer a band of hunter-gatherers stays in one location, the more scarce food becomes and the higher the cost in terms of time spent hunting and gathering versus other social activities. Gradually the band has to move further afield to get a certain amount of food; at some point the energy required by the hunter-gatherers is unlikely to be warranted given the energy content of the food, and the band will move to an area where there is more food available (e.g. for seasonal reasons). Two factors determine the length of stay at a particular location: the abundance of food and the number of mouths to feed. If people wish to minimise the need for mobility, it is sensible to keep the band small. In contrast, farmers will usually clear away natural vegetation, cultivate the soil, plant a relatively narrow range of crops, tend and harvest them, and store a food supply capable of feeding many people for long periods.

Other characteristics of hunter-gatherer economic life tend to be driven by this mobility. For example, material possessions are kept to a minimum: people possess few clothes or furnishings, rudimentary housing, and a small kit

of tools and weapons (Dingle 1988, p. 7). Material goods are literally a burden if no domestic animals are available to do the carrying. The accumulation of wealth makes no sense in the context of hunting and gathering.

Capital equipment in hunter-gatherer societies is kept to a minimum and quickly made. In contrast to farming where planning and investment are important and it is likely to take many months to realise returns, hunting and collecting activities usually take hours. Another notable feature of a hunter-gatherer economy is that the factors of production are evenly distributed: everyone has access to the land and everyone has their own labour power to use. Human capital in the form of training is more important than physical capital and everyone has access to the band's skills and knowledge.

The assumption that Aboriginal technology was simple, limited and geographically uniform has been debunked by recent research. Ian Keen (2004, p. 84) provides an overview of Aboriginal technologies that illustrate a remarkable diversity of production and consumption technologies, many of which were sophisticated and complex. The acquisition, sharing and transmission of knowledge is an important dimension of technology that also included knowledge of raw materials, the construction and use of equipment, seasonality and distribution of resources, and methods for tracking game and otherwise finding food. The main source of energy was fire, which was made with fire drills and fire saws. Given that friction matches were not invented in Britain until around 1830, it is not surprising that early colonists adopted Aboriginal practices of keeping fires alight in their 'tinder boxes' (Boyce 2008, pp. 102–3).

The portability of goods and implements would have needed to be literally weighed against replacement costs. The Yolngu of Arnhem Land use more types of specialised containers, tools and weapons than peoples from the arid areas of central Australia, who have had fewer multifunctional tools because of replacement costs (Keen 2004, p. 85). Some non-human sources of energy were used: the Yolngu also used limited wind power to propel dugout canoes fitted with a sail (Keen 2004, p. 88).

Within Australia, the Aboriginal network of exchange occurred over thousands of square kilometres on the Australian continent (Mulvaney & White 1988). One important venue for exchange were the large periodic gatherings for ceremonial purposes; two important examples were the bunya-nut feast in south-east Queensland and the bogong moth festival in the highland alpine areas of southern New South Wales and the Australian Capital Territory (Flood 1990).

McBryde (1987) documents extensive trading routes from the Selwyn Ranges to the Flinders Ranges (a route of more than 1000 km), with trade in goods including pituri resin. Pituri was used as an analgesic in medical procedures, but it had other productive uses, such as assisting in trapping of emus, parrots and kangaroos by strategic placement in local waterholes.

Anthropologists tend to describe these exchange networks in terms of social and ceremonial rather than commercial or economic motivations (Thomson 1949). Trading exchanges are interpreted as an act of giving rather than as providing something of material value. Gifts were given to cement friendships, to settle grievances and debts or in connection with ceremonies, and often there was an expectation that such gift-giving would be eventually reciprocated. Blainey (1975, p. 215) has suggested that one should not make too much of the distinction between economic as opposed to social or ceremonial motives: 'Without the social bonds the trade would have been difficult to carry out, and the incentive to trade would have been smaller. Without the economic relationships, the social bonds could not have been expressed so satisfactorily nor maintained so firmly.' In Blainey's pithy expression: 'The social and economic were lock and key.'

Hunting and gathering is not simply opportunistic foraging; Aboriginal people have a complex and active resource management that enhances the productivity of the land in terms of resources available for consumption and use. In both monsoonal and semi-arid zones research has revealed 'incipient' agriculture – for example, the replanting of the heads of harvested yams (Altman 1983, p. 115).

Intensivist debate and the 'carrying capacity' of the land

It is important to recognise that the Aboriginal economic system was not static before European contact. Recent research in western Victoria suggests a more intensive land use and a greater technological sophistication than previously thought. Archaeological evidence from the Central Murray River regions revealed a large sample of human bones from the period just before contact, which indicated the population was less healthy than might be expected given the rich resources available in the areas (Mulvaney & White 1988, p. 116). This evidence has led to the 'intensivist' debate because the local population appeared to be suffering from illnesses associated with overcrowding.

One of the chief protagonists in this re-evaluation of Australian pre-history has been Harry Lourandos (1997). Technological change for pre-contact populations is not well understood, in part because evidence for any

technology that did not involve stone or bone is unlikely to survive. While archaeological evidence seems to point to a change to tools with handles about 5000 years ago, Lourandos proposed another transition involving 'social and economic concentration' beginning about 2000 years ago (i.e. the late Holocene epoch).

Lourandos used sketches from journals of Robinson that depict extensive and impressive infrastructure for eeling and fishing (Robinson 1839–49). These drawings illustrate environmental manipulation and earthworks on a scale usually associated with agricultural and horticultural societies (Lourandos 1987, p. 306). Aboriginal dwellers in south-west Victoria and their neighbours were clearly more numerous, more sedentary and more sophisticated than previously imagined.

While the role of intensification is still debated among anthropologists and archaeologists, it has a certain intuitive appeal to economists. Theoretically we expected there to be less physical capital, but there is no necessary reason why Aboriginal people did not build solid infrastructure to enhance the productivity of local environment. Indeed, Keen's overview of technology indicates that Aboriginal people were very concerned to maximise their efficiency and productivity.

Irrespective of the merits of the respective sides of the prehistory debate, this research has led to an upward revision of earlier anthropological estimates of population in Victoria before 1788 because the infrastructure permitted more people to live in a given area. The previous estimates were based on the seminal research of Radcliffe-Brown (1930), which in turn was based on the notion of the carrying capacity of the Australian continent.

In broad terms, there are three main theories of population size in hunter-gatherer societies: density-dependent, density-independent, and self-regulation where social organisation drives what population is sustainable. Economists are more likely to favour the latter two theoretical clusters as they are more likely to allow a role for investment in technology and infrastructure that facilitates more population living in a given area. The density-dependent notion of carrying capacity, at least as applied by Radcliffe-Brown, is rather deterministic.

For an ecologist, the physical basis of carrying capacity is the usable organic matter or biomass produced per unit area over a given time period by plants (Begon, Harper & Townsend 1990, p. 649). The land with the most usable organic matter follows a narrow strip of a couple of hundred kilometres down the east coast from Cape York to the Murray Riverland and Tasmania, but also includes several other relatively fecund areas (for example, the top

end of the Northern Territory and the south-west tip of Western Australia). The Australian seas with the highest biomass range from Bass Strait to the Great Australian Bight and north of the Tropic of Capricorn. The productivity of the sea is usually much less in terms of the biomass than that available on the land (Begon, Harper & Townsend 1990, p. 651).

Radcliffe-Brown's assumptions about the carrying capacity are not consistent with either the relatively intense Aboriginal application of infrastructure described in Lourandos' research or what we now understand about the natural productivity of the land. Butlin strongly argues against Radcliffe-Brown's estimates, which he asserts underestimate the potential for population, especially in south-eastern Australia (Butlin 1993, p. 136).

Mulvaney (2002) argues that Radcliffe-Brown's assumptions about carrying capacity should be amended to recognise that the country had greater capacity to sustain people before European settlement. Among the reasons given for the re-evaluation are the greater role of female food gatherers in the provision of food supplies and the impact of firing land on increasing productivity of the land. Mulvaney estimates Australia's population before 1788 could have been as high as 1.25 million, but he concludes that 750 000–800 000 is the most reasonable range.

Fire-stick farming versus hunting and gathering

There is little doubt that the arrival of Europeans has had a more significant impact on Australia's environment than the activities of Aboriginal people; however, there is widespread consensus that firing of vegetation by Aboriginal people seems to have caused regional changes in vegetation patterns soon after their arrival on the continent (Young 2000, p. xv). It is clear that Aboriginal people have not been passive receivers of nature's bounty and have actively managed the productivity of land through what Rhys Jones called 'firestick farming' (Jones 1969).

Many Aboriginal people still actively use fire-stick farming (Kimber & Smith 1987). In the southern Aranda group of the Simpson Desert, women actively debate with their husbands as to which vegetables and fruits they will favour for the next season. Hunters are chiefly concerned with ensuring a suitable pattern and temperature of firing. The purpose can vary – it may be the protection of certain trees and sacred sites or the promotion of plants to increase their productivity after a fire.

Observant explorers from the colonial period noticed that the Australian vegetation appeared to have been shaped by Aboriginal cultural practices. Edward Eyre, Ludwig Leichhardt and Thomas Mitchell reported grass burnt



Figure 4.1 'Aborigines using fire to hunt kangaroos'

Source: Joseph Lycett, ca. 1817, National Library of Australia, an2962715-s20.

in mosaics to reduce fuel and to generate green pick to lure grazing animals (Gammage 2011). Fire was not an indiscriminate tool of fuel reduction or grass promotion, but was carefully employed to ensure certain plants and animals flourished, to facilitate access and rotation, and to ensure resources were abundant, convenient and predictable. Indeed, Gammage argues that enhanced productivity of land that Aboriginal people achieved was superior to farming.

Gammage's thesis is not necessarily new, but he drew together an impressive array of visual records of the Australian landscape to supplement the written research. Figure 4.1 illustrates some of the major issues. Early Europeans often commented that the land looked 'like a park with extensive grassy patches and pathways, open woodlands and abundant wildlife'. What the early colonist failed to appreciate was that Aboriginal people managed the land in a far more systematic and scientific fashion, with a precise regime of burning to create open grassland and wooded areas in the optimal location for hunting kangaroo and other game. Note how the kangaroos in this picture are being smoked out of the woods into open areas where Aboriginal people can shoot their spears from the high ground.

Gammage believes that Aboriginal people had enough commonalities in their management practices so that Australia can be called a single

estate; and in a sense the original inhabitants can be said to have 'made Australia'. It is true that despite vastly different plant communities, from ecologies as diverse as spinifex deserts to rainforest, Aboriginal people used fire as a tool. However, Gammage has overstated the level of uniformity in Aboriginal land management and underplayed the inherent diversity across Australia because this added coherence to his argument and exposition. Notwithstanding, his main point is well made.

Aboriginal burning regimes were more cost-efficient than the labour-intensive cultivation of grasses introduced by colonists (Boyce 2008). Early pastoralism relied on Aboriginal techniques, but in areas where Aboriginal people had been dispossessed, the British were forced to set the country on fire themselves. One colonist in the 1830s noted that pastoralists burnt portions of their sheep run at different times so as to have a new growth about every three years. When this was neglected, the 'conflagration is thrice as mischievous in the destruction of fences as it otherwise would have been' (Louisa Meredith quoted in Boyce 2008, p. 103).

Visitors from another world

The first Europeans recorded as having made contact with Australia and its Aboriginal population were the Dutch who played a crucial role in mapping a substantial portion of the coastline (Sutton 2008). Within months of Willem Janszoon's charting of the west coast of Cape York Peninsula in 1606, violent confrontations between local inhabitants and explorers are documented (Veth, Sutton & Neale 2008). By the time of James Cook's voyage of discovery in 1770, there were at least 36 other contacts made by Europeans (Veth, Sutton & Neale 2008, p. viii). Note that not all contacts were violent, but each direct contact with Aboriginal populations represented an opportunity for transmission of infectious diseases.

These initial encounters were not motivated by an imperative to trade. William Dampier landed at Shark Bay in 1699 and showed no enthusiasm for what he saw. Dampier saw nothing that would foster trade in the new land; he wrote that 'the inhabitants of this country are the miserablest people in the world ... who have no houses and skin garments, sheep, poultry, and fruits of the earth, ostrich eggs' (Dampier 1998 [1697]). These early explorers saw little economic value in *Terra Australis*.

Only one commodity was valued beyond Australian shores towards the end of the 18th century: the sea slug or trepang that was collected by the Macassans from South Sulawesi in what is now Indonesia.

The Macassans and the first Australian export industry

The Chinese consumption of trepang grew substantially in the 16th century and the import trade growing with the first Chinese junks arrived in Macassar in 1615 (Mulvaney 1987). The demand for trepang soon outstripped the supply in the local Asian waters and Macassan fishermen sailed their boats (or 'praus') further afield. They found ample supplies of trepang in the shallow waters off the northern Australian coastline from the Kimberley to the Gulf of Carpentaria.

The Macassans have an important role in Australian economic history in that they arguably constituted the first Australian export industry. Campbell Macknight used Dutch and British colonial records to fill in the details of one of the most extensive contacts of Aboriginal people with the outside world. The trepang trade was in its infancy in the 1720s, but the trade was well established by 1754 (Macknight 2008, p. 136; Macknight 1976, pp. 70–95).

Many Aboriginal people went to Macassar on praus, and amicable trading relations were established (Macknight 1976). Two factors were important: first, Macassan captains established proper relationships and recognised that Aboriginal people owned the land and seas and paid them due respect (Thomson 1949, p. 51); second, Aboriginal people had no use for trepang and hence there was no competition for resources. The scope for exchange was considerable because as many as 3000 Macassans were based in Australia during the monsoons when it was difficult to sail back to the home port (J. Campbell 2002, pp. 73–4).

Table 4.1 estimates the value of trepang imported and exported into Macassar using colonial records on shipping, including those of the Dutch East Indies Company. Import volumes measured in tonnes increased by a factor of 20 between 1720 and 1760, which can be taken to indicate that a new supply was found over that period. The import volumes stay relatively stable until 1780, by which time the trade in trepang around northern Australia was well established. Note how the import cost increases substantially between 1720 and 1760, which is consistent with the increased frequency of a more costly trip to Australia in order to secure the trepang being demanded in China. The export price was substantially higher than the import cost in all the periods examined, so there was a healthy profit to be made from the trade. The profits appeared to be particularly high in 1760 and 1780 and in those years there would be a substantial incentive to explore for new areas to harvest trepang.

Given that the import costs stay relatively stable from 1760, it is not unreasonable to assume that the extra 160 tonnes of trepang secured between 1720

Table 4.1 Aboriginal people, the Macassans and Australia's first export industry: trepang trade in Macassar, 1720–80

	Macassan import trepang (in tonnes)	Import cost per tonne (2011 AUD)	Macassan export trepang (in tonnes)	Export price per tonne (2011 AUD)	Total value imports in AUD (‘000)	Total value exports in AUD (‘000)
1720	5.1	3838	23.5	5802	20	136
1760	112.3	15 828	75.9	40 800	1777	3097
1770	118.5	13 610	173.8	21 726	1613	3776
1780	167.0	15 109	161.7	40 013	2524	6470

Notes: The units for the original table were measured in pikuls and rixdollars. In order to render the value meaningful to the modern reader, these measures need to be translated. A pikul is a traditional Asian unit of weight defined as ‘much as a man can carry on a shoulder-pole’, with the modern consensus being that a pikul is 60.5 kg. One rixdollar is approximately three historical guilders. The guilder measured in the respective years can be expressed as 2011 euros, calculated using the following website: <http://www.iisg.nl/hpw/calculate.php>. It is then easy to translate the euro into Australian dollars (AUD) using a currency-converting website (e.g. <http://www.oanda.com/currency/average>). Source: Author's calculations based on Knaap and Sutherland (2004, p. 111).

and 1780 came from Australia or at least a place that was equally remote and hence it cost a similar amount to harvest and transport the trepang to Macassar. If we make the assumption that all the extra trepang imported to Macassar after 1720 came from Australian waters, the value of the first Australian export industry was over \$6 million in current Australian dollars.

Table 4.1 provides indirect evidence that the contact with the Macassans had probably been significant since at least the 1760s, and may have dated back a few decades before the mid 18th century (Macknight 1976).

The monetary value of the trade may have been appropriated largely by the Macassans when on-selling trepang to the Chinese, but the Aboriginal population in the northern Australia gained substantial value from the trade. Keen (2004) argues that the use of dugout canoes with rectangular sails in Arnhem Land is a clear indication that there was some technological exchange.

Other technological adoptions or cultural borrowings from the Macassans include foods, drinks, tobacco, pipes, cloth, rifles, knife, and tomahawks (Brady 2008). Sometimes the trades in these objects occurred far inland, which is in itself an indication that Macassan objects had significant economic and social implications (Thomson 1949, p. 51).

Not all of the exchanges between Macassans and Aboriginal people were positive (Mulvaney 1987, p. 101). Macassan voyages were sometimes punctuated by violence caused by disputes over women or thefts of coveted canoes and metal objects. Yet nostalgia for those regular visits have become deeply embedded in Aboriginal ritual life in northern Australia.

The English, the Macassans and smallpox epidemics

Smallpox is thought to have been one of the major reasons for the extensive Aboriginal depopulation in the early colonial period. A naval surgeon from the First Fleet claimed that the original inhabitants were remarkably healthy even a few months after the original European settlement in 1788 (J. Campbell 2002, p. 1). In his 1983 book *Our Original Aggression*, Noel Butlin makes a provocative claim that the English deliberately released smallpox to depopulate the original inhabitants in order to make the Australian continent easier to colonise.

Butlin was not the first or last to suggest that the English introduced smallpox. While Butlin characterised the spread of smallpox as a deliberate aggressive act, many others have claimed that European germs inadvertently lead to the demise of Aboriginals in the colony of New South Wales (e.g. Curr 1886–87).

One reason for doubting that Port Jackson was the original site of smallpox outbreak in 1789 is that eradication campaigns since the 1970s have demonstrated that the smallpox virus is adversely affected by high temperatures. Judy Campbell (2002, p. 84) argues that the ‘variola’ matter of the First Fleet was probably inactivated by the voyage through the tropics in 1787. There was also an unduly long gap between the landing of the First Fleet in January 1788 and the first outbreaks of smallpox in April 1789 and hence the virus would have had to remain active over the hottest part of two Australian summers. Even Watkin Tench, the only person to have mentioned that the First Fleet surgeons had a supply of variola matter, clearly thought that there had been no reason for it to be used even if the English wanted to (J. Campbell 2002).

Cleland (1928) was one of the first to openly question the hypothesis that the disease spread out from the Port Jackson colony when he suggested that smallpox was introduced by Macassan trepang collectors on the north coast. Judy Campbell (2002, p. 85) provides a rather compelling map that documents actual and hypothetical outbreaks of smallpox between 1780 and 1790. The map is based on retrospective reports from elderly pockmarked people who claimed to have had smallpox in that decade while living in the Northern

Territory, South Australia and throughout the eastern seaboard. Most of the period covered by Campbell's maps pre-dates the arrival of the First Fleet. With over 40 outbreaks documented by Campbell over geographically dispersed areas, it seems highly unlikely that smallpox was spread solely from Port Jackson.

For his part, Butlin (1993, p. 139) emphasised various blocks to transmission of disease from the north, namely climatic, social and economic factors (for example, presuming a breakdown of communication in the monsoon season). The 1988 WHO report *Smallpox and its Eradication* showed that the transmission of smallpox was possible in small nomadic populations, as in Somalia, and could be unexpectedly prolonged. Hence, the scope for the transmission of a live virus through infected individuals in areas with relatively low population densities in central Australia was probably greater than Butlin appreciated. Furthermore, the evidence of Macassan trade in Cape York means that smallpox could plausibly have been transmitted through the relatively dense population down the east coast of Australia.

While Butlin was arguably wrong in his emphasis about the original source of smallpox, there is no particular reason to doubt his detailed simulations about mortality and morbidity for the Aboriginal population. The outbreak of smallpox in New South Wales was probably correctly identified as occurring in 1789, so the simulations based on the progress of diseases are likely to provide a reasonable estimate of the effect on the Aboriginal population during the early colonial period.

The remainder of this chapter assumes that the spread of the disease is relatively fast, with original vectors of disease being spread from either the top end of Australia (via the initial contact with infected trepang collectors from Asia) or Port Jackson. One exception to this characterisation of disease transmission is Tasmania (known until 1856 as Van Diemen's Land), where, as the next section will show, other factors were probably more important.

Europeans had brought a similar set of diseases in previous colonial enterprises. Perhaps the closest analogy is when the Spanish arrived in the New World after Columbus' voyage in 1492. The pre-Columbian indigenous population had not been exposed to smallpox and a vast range of diseases that the European colonist had been routinely exposed to since childhood. Historical demographers acknowledge that the mortality rate varied from place to place, but estimates of the post-Columbian depopulation rates are often between 90 and 98 per cent, with an overall decline of 95 per cent becoming a rule of thumb (Stannard 1992).

While the size of the depopulation experience in North America was enormous, there are several points that need to be made when attempting to draw lessons for the Australian situation. In contrast to the depopulation of Aboriginal Australians in the 60 years after colonisation, the timeframe of the North American estimates is much longer, being over 400 years. Given that the American population had several centuries to recover from the initial population loss, even the lowest estimate of net population loss is enormous (Kroeber 1939 estimated a depopulation of 50 per cent). Theoretically, one would expect the immunity to introduced diseases to increase over time, even in previously unexposed populations, and hence the mortality rates would decline and populations should recover after the initial population loss. Another issue is that it is highly unlikely that there would be a constant loss of population spread over 60 years let alone 400 years. It is intrinsically hard to compare population loss in the two continents; however, it is reasonable to surmise that the depopulation arising from introduced diseases was probably concentrated in the early years of settlement or when there was a rapid period of colonial expansion.

Other colonial experiences may be relevant. New Zealand Maoris did not seem to experience major smallpox outbreaks in the post-contact period, with most disease and associated mortality attributed to dysentery, tuberculosis and influenza (Pool 1991, p. 45). Where smallpox epidemics were reported in the Pacific Islands, there are claims that around one-third of the indigenous population perished (Rallu 1992, p. 189). Other important diseases introduced were measles and venereal diseases, the latter impairing potential for population recovery by reducing female fertility.

Counting the costs

The frontier and economics of 'takeover'

It is singularly appropriate for an economic history of Australia to consider the costs of colonisation or, rather, contact with the outside world. While the spreading of disease was probably unintentional, the economic costs of the 'takeover' (Butlin 1993) are also associated with a conscious attempt to dispossess Aboriginal people through frontier violence. At the very least the appropriation of land was based on the failure to recognise the original custodianship of the land and was rationalised in terms of the greater use or productivity that the newcomers would make of the land. As noted above, this rationalisation was just that, especially in the early days of the colony, as Aboriginal people were more likely to make productive use of the

land. This section briefly documents frontier conflict to 1850 in order to gain further insight into the economics of the takeover, before deriving estimates of the Aboriginal and other Australian populations.

The Aboriginal Australians were dispossessed in two stages: legal dispossession and physical dispossession. Legal dispossession was instantaneous from the perspective of English law. Aboriginal people were at once trespassers on their own ancestral land. While they had unwittingly become British citizens; if anyone was killed in frontier conflict it was a criminal offence, not an act of war in defence of one's own lands.

Physical dispossession was rather more gradual, but the pace of dispossession increased with the pace of colonial expansion that took off in the 1820s with the development of pastoral methods of fine wool production.

From the earliest days of the Port Jackson colony there were instances of violent conflict with the local Eora people (Horton 1994). The Eora had initially been friendly towards the new visitors but by February 1788 one local was shot when he tried to take some tools while another was killed in a fight with convicts. Soon after, two convicts cutting rushes were killed by Eora. Food supply was not assured, and with the colony feeling physically insecure Governor Phillip decided to kidnap some Eora to either force the Aboriginal inhabitants to attack en masse so that the British could fight them in a proper battle or to facilitate communications with the local population (Tench 1789). On 30 December 1788, Arabanoo was captured and hence had the distinction of becoming the first of many Aboriginal people imprisoned by the state.

Arguably there was an undeclared war that underlay the establishment of the colony. Rowse (2005, pp. 213–16) provides maps of both colonial military operations and Aboriginal resistance that illustrate several major conflicts were seen in Port Jackson in the first two decades of settlement. Military campaigns occurred over substantial parts of southern Australia between the 1820s and 1840s. In many cases Aboriginal-initiated attacks pre-date the military operations, but these conflicts roughly follow the expansion of the colony as the squatters settled on any good grazing land. In general, the governor had no control over these settlers, who simply took land even when it was far away from main settlements, surveyors and police. It was a recipe for conflict as Aboriginal livelihoods were compromised or simply forcibly displaced.

The Native Police was first established in Victoria in 1842 to prevent and limit violent clashes between settlers and Aboriginal people. Its activities radiated out from its Victorian origins and its members became renowned for

their violence until the force was officially disbanded in 1897. It was probably most successful in 'reducing' and demoralising the Aboriginal population in Queensland, particularly in the Darling Downs and in the north of the state (Rowse 2005).

The conflict in Tasmania requires a special mention. Lieutenant-Governor Arthur responded to escalating conflicts by getting every male settler to form a 'black line' in 1830 that marched from the north of the island to the south-east in order to capture Aboriginal inhabitants. While this exercise was an expensive fiasco, by the end of 1834 Aboriginal Tasmanians were convinced to give up their warfare and move to the Bass Strait Islands (Boyce 2008). The camps on these islands became death camps, with many of the inhabitants, if not most, dying from respiratory diseases. The Tasmanian Aboriginal population was reduced dramatically so that by 1861 only 18 Aboriginal people were identified in official records (Smith 1980).

Butlin (1983a, p. 99) outlined a range of options available to Aboriginal people when confronted with colonial expansion: do not respond to white competition and starve; become more mobile and use the lands of other tribes; assist white occupation; seek compensation for resource loss; seek regular wages with colonists; fight each other for resources; claim white goods by force or fighting colonists for resources; kill colonists; have Aboriginal women 'yield' to male colonists; and submit unconditionally. Note that the resistance options all involved the Aboriginal inhabitants committing crimes against British subjects.

Arguably, the dominant influence undermining the resources of the original Aboriginal population was colonial livestock, which rapidly changed the habitats of the small animals, destroyed perennial plants and ate yam beds wholesale (Butlin 1993, p. 130). Colonists exacerbated the process by selectively destroying areas favoured by the original population and hence indirectly killing Aboriginal people.

Butlin (1983, p. 56) explicitly modelled the effect of resource loss in his simulations of how Aboriginal people were affected by the colonial expansion. He hypothesised four possible responses: work harder; reduce consumption; reduce the number of dependents; and disperse any white impacts by competing for the resources of neighbours. The loss of land and resources was accompanied by loss of life. Furthermore, the enormous population loss would combine with the competitive tensions within Aboriginal groupings to undermine the ability to use cooperative modes of production (Butlin 1983, p. 160). The larger the loss of population, the greater the loss of economies of scale.

Estimates of the Aboriginal population before colonisation

The estimated size of the pre-colonial Aboriginal population has increased substantially over the last 200 years. The early estimates were based on local observations that were by definition incomplete. A figure of 115 000 was widely cited by official sources throughout the 19th century. The first credible systematic estimates of the Aboriginal population were provided by Radcliffe-Brown (1930, p. 696), who referred to 'the original population of Australia having been certainly over 250 000, and quite possibly, or even probably, over 300 000'. Radcliffe-Brown deliberately provided conservative estimates because the 'data are scanty and for the most part unreliable'.

Smith (1980) conducted a comprehensive survey of historical estimates of the Aboriginal population that applied standard demographic techniques to 'backcast' (as opposed to forecast) the pre-colonial population, the result being a figure of 314 500 that was remarkably close to that of Radcliffe-Brown.

Butlin (1983) upwardly revised the pre-colonial Aboriginal population in south-east Australia by a factor of five. Butlin not only brought an impressive array of evidence to bear on the issue, but he also introduced economic models of Aboriginal production that incorporated elements of specialisation. Butlin's initial argument was that existing understanding of pre-1788 Aboriginal populations is largely based on the population observed and recorded by colonists. Having successfully cast doubts on the extant population estimates, Butlin constructed simulation models to systematically explore plausible population scenarios. He benchmarked mortality rates for smallpox using epidemiological information from one of the last major outbreaks of smallpox in the world in 1974. Butlin allowed a considerable margin for error in his simulations in order to counter the tendency that previously unexposed populations are likely to be more affected by diseases introduced to a population without immunity. The 1974 Indian smallpox mortality rates of 30 per cent were used as the base rate, but that population had been exposed to the disease over a long period. Butlin also uses parameters that assume a higher mortality rate for smallpox but those are similar to the lowest overall death rate for the first exposure of native Americans to European diseases.

Butlin's simulations are also based on variations of assumptions about life expectancy at birth (i.e. 20 and 30 years), fertility rates, venereal disease rates, murders of Aboriginal people and resource loss; but he tends to hold the timing of diseases and resource loss as being invariant (e.g. venereal disease outbreaks beginning at 1815). Butlin does balance these tendencies to

depopulation with assumptions about population recovery from reduced black warfare and reduced infanticide.

The net results of Butlin's original simulations involve 25 scenarios that deliver estimates of the original population that vary by a factor of five, with the original population declining to 1850 to between one-half to less than one-tenth of the pre-1788 population. While most commentators focus on final population estimates, simulations such as these are unavoidably speculative because underlying parameters cannot be verified.

Butlin's (1983) demographic simulations provided new understanding about the importance of the role of diseases and have allowed researchers to put other factors about colonial Australia into perspective. Mulvaney and White (1988) used Butlin's formulation to arrive at a pre-colonial Aboriginal population of 900 000. Since then, Mulvaney and Kamminga (1999) present the current consensus on pre-colonial Aboriginal population, around three-quarters of a million (also presumably based on some of Butlin's mid-range parameters, but it appears to assume the impact of smallpox was less in North Australia).

Simulations based on population nadirs or (near nadirs), such as Butlin's estimates, are intrinsically variable or uncertain in that they are backcast based on the period when the population is smallest. Hence, it is important to conduct some sensitivity analysis to provide some sense of the reliability of underlying population estimates. Mulvaney's and others' estimates are based on the authors' expert judgment; however, Figure 4.2 reports the basic range of disease parameters reported in Butlin (1993) so that some important issues can be discussed that are not dependent on the precise estimate for the pre-colonial population that one prefers.

Judy Campbell (2002) documents how smallpox, and possibly other exotic diseases, may have entered through northern Australia and appeared to have been almost instantly widespread across the continent by 1790. European diseases may have also originally been transmitted from the English colonies in south-east Australia, but multiple sites of infection were likely to ensure that transmission across the continent was relatively fast. Hence, it is not unreasonable to generalise about Butlin's scenarios on the basis of the most credible population estimates for the mid-19th century. Figure 4.2 uses the minimum population estimates from Smith (1980) and Butlin's basic demographic parameters to generate a range of estimates of population size. Readers should note the wide range of estimates for the pre-contact population. Another novel feature of Figure 4.2 is that it plots the possible paths

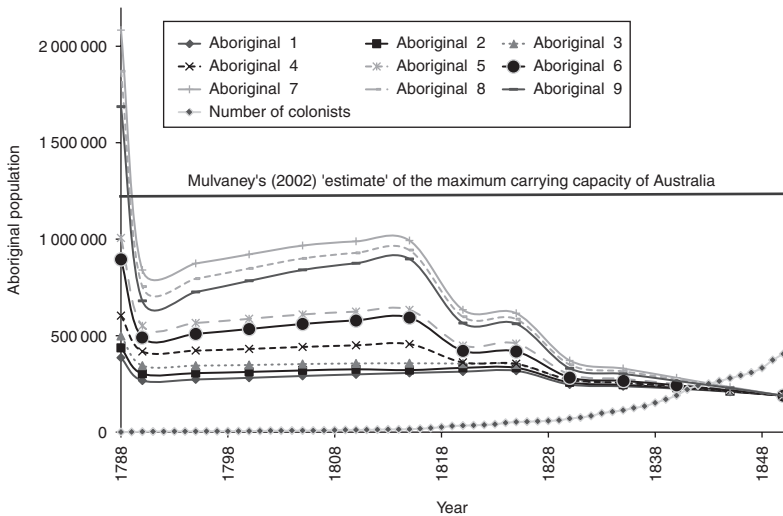


Figure 4.2 Revisiting the Butlin estimates of the Aboriginal population, 1788–1850

Sources: Backcasting the minimum estimated counts of the Aboriginal population in 1861 and 1871 is based on Smith (1980). The 1850 estimates are based on a backcast of the earlier population counts assuming a constant growth rate from 1861 and 1871 to infer likely population in each state in 1850. Depopulation rates are then applied using the range of scenarios outlined in Butlin (1993, p. 128). Colonist estimates are from Hutchinson (2013).

of depopulation of Aboriginal people under various scenarios. The shape of each path is associated with an initial outbreak of smallpox in a previously unexposed population, followed by a period of 20 years of population recovery and then secondary outbreaks of venereal disease and smallpox around 1815 and the 1820s. The more gradual decline after this period is partially attributable to what Butlin rather euphemistically calls ‘resource loss’.

Note Radcliffe-Brown’s (1930) numbers are slightly lower than the lowest estimates in Figure 4.2. However, the highest three population scenarios give pre-contact population scenarios that are substantially higher than Mulvaney’s (2002) estimate of the maximum carrying capacity of the Australian continent, 1.25 million people. The median scenario, identified in the legend as ‘Aboriginal 6’ and highlighted as a thick black line with round dots, is well below this carrying capacity and is plausible in the absence of ancillary assumptions and further modelling.

The median backcast is somewhat higher than the current consensus on the pre-contact population, but it is preferred in the following discussion as it

provides a clear population path for the early colonial period. If the consensus number is simply a compromise between Radcliffe-Brown's and Butlin's methodologies, then arguably it is not consistent with either method. The median simulation is based on an internally consistent methodology (Butlin's parameters) even if the estimate obtained is contestable.

While the assumptions underlying that simulation may be incorrect, they are transparent and the estimates are replicable. Future researchers can, and should, improve on the estimates.

Notwithstanding reasonable scepticism about these backcasts, it should be reassuring that this median is in the middle of the range of recent estimates of the 1788 population based on projections from comprehensive archaeological records over 50 000 years and justifiable assumptions about the founding population based on mitochondrial research of observed genetic diversity (Williams 2013). External validation of analysis is important in an inherently uncertain area of research.

The main insight from Figure 4.2 is that, whatever the true population path, the Aboriginal population greatly outnumbered the colonists until the 1840s. Consequently, the omission of the Aboriginal contribution to the economic history of early colonial period in Australia is particularly problematic.

Aboriginal and colonial economies in transition

Butlin (1994, p. 212) discusses the growth performance of the colonial economy, which he introduces by reference to the population level in 'two societies': Aboriginal people and colonists living in south-east Australia. The terminology of 'two societies' rather begs the question about the extent of interaction between the Aboriginal population and the colonists, but for the moment let us assume that the Aboriginal and colonial economies were effectively separated. Butlin (1994) estimates that output per head was initially higher among the Aboriginal inhabitants; however, he claims that the colonists' productivity soon overtook Aboriginal productivity and was around twice as high from around 1810, with the disparity maintained after that time (£30 as opposed to £15 per head in 1830 prices).

Butlin's estimate of the GDP of the Aboriginal economy displays a remarkably similar pattern to the pathways observed for the Aboriginal population in Figure 4.2: the size of the Aboriginal economy is substantially larger than the colonial economy until the 1840s. One can draw the conclusion that notwithstanding the increasing trading opportunities in commodities such as wool, and the development of infrastructure and capital inflows that largely

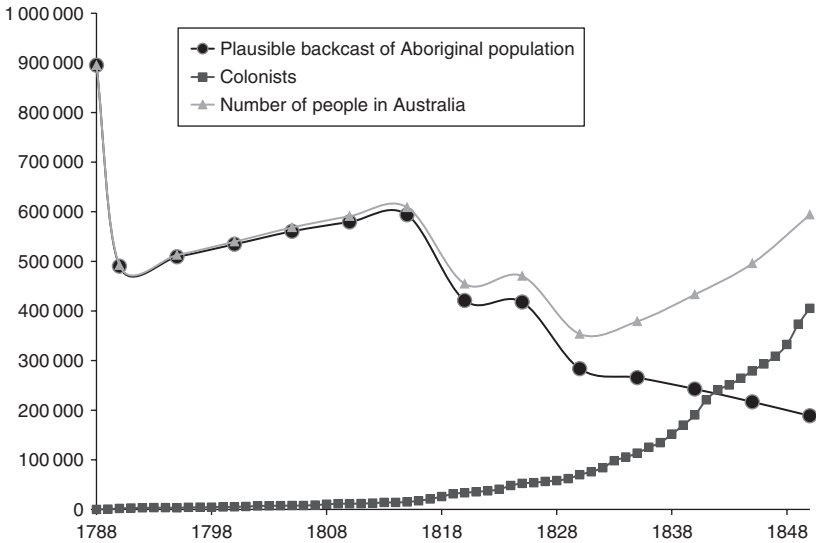


Figure 4.3 Population takeover: Aboriginal and colonist populations, 1788–1850

Sources: See Figure 4.2.

occurred after Governor Macquarie's arrival in 1810, the respective size of the economies is largely driven by the size of their populations.

There is likely to be a substantial differential between productivity and standard of living in that Aboriginal people were not usually paid wages for their labour; rather, they were remunerated in rations, rum and tobacco (Norris 2010, p. 38). Scarcity of labour in pastoral areas led to the employment of a sizable number of Aboriginal agricultural labourers until extensive fencing made them redundant in the 1850s (Pope 1988).

Figure 4.3 focuses solely on the median scenario for the Aboriginal population in order to present a plausible estimate of the number of people living in Australia in the early colonial period. This break with the Butlin tradition of characterising Australia as comprising two societies illustrates a few salient points. First, Australia's early economic history can only be characterised as a rapid rise of a prosperous nation if one ignores the Aboriginal population. If one considers all the residents of Australia, there is a clear decline in Australia's GDP of prosperity until around 1830. Another related observation is that the total Australian population was still less than the pre-contact Aboriginal population until the gold rush brought a threefold increase in the number of colonists.

Second, if there were so many Aboriginal inhabitants that could potentially supply labour, then why is the dominant narrative of the Australian labour market in the 19th century one of almost continual scarcity and relatively high wages by international standards (Seltzer, this volume)? This observation is probably a validation of Butlin's implicit assumption but it raises another question: why did Aboriginal people not seem to affect the labour market? Ultimately, this probably reflects exclusion from the labour market arising from the fact that Aboriginal people and colonists were often in open conflict over this period. Institutional constraints on participation in the Australian economy will have become more prominent in the second half of the 19th century with the establishment of Aboriginal protection boards that controlled many aspects of daily life and regulated wages received (or rather not received). Of course, it could also reflect the choice by Aboriginal people to maximise their separation from an alien culture, but there is some evidence of intercultural trade where both parties saw considerable value in the exchange.

Boyce (2008, pp. 84–7) discusses cross-cultural encounters in which Aboriginal children were baptised and lived with white settlers and soldiers. Philanthropic motives notwithstanding, the most important reason for procuring (sometimes kidnapping) Aboriginal children was the unpaid labour they could provide. The children's bush knowledge and their ability to liaise with the settlers would also have been valued. Furthermore, unlike most former convicts, Aboriginal people were allowed to travel without restrictions, making them attractive recruits for sealers, whalers and merchants. Boyce suggests that Aboriginal families may have seen some advantage in having older children living with the British, thereby binding the newcomers to reciprocal kinship obligations or simply satisfying the locals' curiosity about British life.

Another instance of intercultural cooperation and trade arose from the fact that dingoes never got to Tasmania. Consequently, Aboriginal people enthusiastically adopted hunting dogs from colonists, which allowed meat to be obtained more efficiently in open grasslands (Boyce 2008, p. 66). The most immediate consequence of physical dispossession was that by 1832, certain areas in Tasmania were reported to have been overrun by wild dogs (Boyce 2008, p. 206). These examples illustrate the limitation of Butlin's assumption of two societies but also rationalise it as a simplifying assumption. Clearly, there was substantial intercultural engagement between groups in various periods, but the overwhelming tide of dispossession ensured that trade

was rather one-sided and only significant for as long as the colonist needed specific Indigenous skills and resources.

The Aboriginal legacy

The main legacy of the pre-colonial population is Aboriginal people who continue to live throughout Australia. While the size of the original Aboriginal population declined dramatically after first contact with European colonisers and Asian traders, Aboriginal people and their culture have survived in their descendants alive today. Of course, the entrenched disadvantage facing many Aboriginal people today at least partially reflects the cumulative effects of history, especially the low level of endowments that make it difficult to compete in the contemporary Australian economy, but it may also reflect differential treatment (discrimination) and even possibly cultural differences (Hunter 2005).

While cultural difference may partially act as an impediment to Aboriginal people fully engaging in the contemporary economy, it is also central to the core Aboriginal value of looking after country. Altman and Kerins (2012) demonstrate how maintaining customary practices and keeping Aboriginal culture strong is crucial for maintaining a vital Australian landscape (see also Altman and Biddle, this volume).

Of course, the legacy is embedded not only in the population but also in the development of natural resources that were utilised by generations of Australians, most notably pastoralists. Pastoralists in the 19th century inherited a landscape that was managed and shaped over thousands of years in ways that made it suitable for grazing sheep and cattle. Firestick farming certainly increased the value of pastoral properties that were important in establishing cash flow in the early economic development of Australia. Many pastoralists soon realised that Aboriginal burning practices forced the release of nutrients and the growth of 'green pick' on which their animals thrived (Young 2000, p. 42). Australian resource and environmental managers also have a lot to learn from an active engagement with living Aboriginal culture.

The largest ongoing legacy for Australia is in the management and appreciation of local ecology. Frequent and extensive planned fires may be helpful in maintaining current vegetation boundaries (and biodiversity). Aboriginal knowledge about managing the intensity and size of bushfires will have enormous ongoing value to an Australia experiencing with increasing frequency difficult weather events, such as droughts.

The convict economy

DAVID MEREDITH AND DEBORAH OXLEY

Whatever the aims of the British government may have been, the immediate human outcome of the effort was, so far as Australia's settlement was concerned, summed up for a long period in one word: convicts. Convicts made up for most of the first 60 years of Australian history, the dominant flow of human beings, the primary increment to the population and the main source of labour. (Butlin 1985c, p. 1)

The contours of Australian colonial economic development are well established (McLean 2013; Butlin 1986b, 1993, 1994; Madsen, this volume). This chapter focuses on the contribution made to economic growth by British penal transportation. In one sense everything that happened in early European Australia was due to penal transportation because without it the colonies would not have been formed. Nevertheless, at a less general level it is possible to explore the nature of the system that brought over 163 000 people to Australia, who they were and how they built an economy which surprised their contemporaries (Goodwin 1974, p. 14). The chapter commences with the development of penal policy before examining convicts as criminals, then as coerced workers. Coerced labour has often been associated with high land-to-labour ratios in areas of European settlement and in this respect Australia appears to have been no exception (Nicholas & Shergold 1988d; Meredith 2013). We then examine the role of convicts in creating a free labour force. We conclude by assessing the importance of penal transportation for colonial economic growth and the legacy white Australia inherited from its convict origins.

Penal policy

The Transportation Act of 1718 was Britain's 'offshore solution' to the problem of rising crime following the end of the War of Spanish Succession (Beattie 2001, p. 430). It played a critical role in weaning Britain from its gruesome

reliance on the death penalty, in the process creating convict Australia. At that time Britain ran a bifurcated system of punishment. Misdemeanours were punishable by whipping, fines, the pillory and stocks. All felonies were punishable with death. Exemplary punishment – death – substituted for the modern matrix of police, subsidised prosecution and imprisonment: the chances of getting caught might be low, but if you were, the repercussions were terrifying. The horror of such a system was ameliorated by a legal curiosity called ‘benefit of clergy’ that enabled the majority of convicted felons – even murderers – to evade the noose and instead walk free after a whipping or branding (Beattie 1986).

By 1718 the British fiscal-military state was sufficiently cashed up to develop a new exemplary punishment and penal exile was fashioned in the imagination as a hell-like substitute for the terror of execution. Its dread arose from banishment to another land as something akin to a slave, albeit for a fixed period of time. The Transportation Act made three provisions: it allowed for the death sentence to be commuted to transportation ‘beyond the seas’ for those pardoned by the King (typically for 14 years or life); guilty felons who claimed benefit of clergy could now be transported for seven years; and petty larceny – a misdemeanour – was also made punishable with exile, if a judge so desired. Transportation thus emerged as an alternative to death, freedom and corporal punishment. Judges embraced the new sentencing option with great enthusiasm. Simultaneously (and perhaps functionally related), the laws of England exploded in number. There emerged a ‘Bloody Code’ over the 18th century with more than 200 capital statutes (i.e. crimes punishable by death), at a time when the French had six. The code relied on death, but also death commuted, and transportation as a direct punishment in its own right.

The consequence of these developments was to shape the size and nature of the convict outflow from Britain. Figure 5.1 illustrates the numbers transported over the life of the Transportation Act. The American colonists received around 500 to 1500 felons per year. The hiatus caused by the American War of Independence (1775–83) is then clearly visible. The suspension of transportation lasted beyond the end of the war because it took Britain several years to decide on a new destination for its transported convicts. When deportation resumed in 1788, it was to invade Australia with a most peculiar imperial force: convicts and their gaolers. This time transportation was on an altogether different scale. America was an established country with existing coerced labour, easily absorbing comparatively small numbers of criminal immigrants. Transportation to Australia would last longer, shift

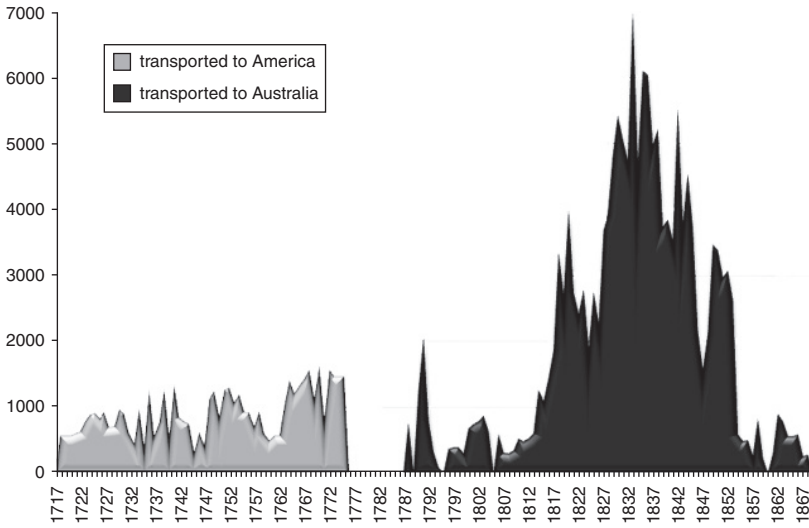


Figure 5.1 Numbers transported from Great Britain to America (1717–75) and Australia (1788–1868)

Source: Meredith & Oxley (2007).

out more felons and be the principal instrument by which a whole new British nation abroad was crafted. This was the creation of Australia's convict economy. Whatever the merits of naval or other motives in explaining Britain's choice of Botany Bay, there can be no doubt that the settlement in New South Wales was founded for penal purposes and that the flow of convicts was fundamentally shaped by English law and domestic considerations (Christopher & Maxwell-Stewart 2013).

Britain's invasion of Australia was less a Big Bang than a dribbling start. The resurrection of the policy to New South Wales was patchy during the French War years, but – mirroring the crime rate – escalated with demobilisation around 1815. While those years were particularly crime-prone, they were part of an upward trajectory in committals associated with a burgeoning population, increased quantities of movable wealth, and probably greater poverty during the economic upheaval of Britain's Industrial Revolution (Gatrell & Hadden 1972). Draconian labour legislation and social unrest contributed to a peak of nearly 4000 exiles in 1820. The vast bulk of convicts would arrive on Australian shores in the decades that followed, as a result of significant legal reform dismantling the Bloody Code and substituting transportation for the death penalty. Transportation became the cornerstone of

British punishment. The numbers sent to Australia skyrocketed, reaching a crescendo in 1833 when almost 7000 transportees landed in the colonies in just one year.

Substantially retrenching the hangman's rope required a stiff alternative. Campaigners for law reform recognised this, and when in 1818 they established the Select Committee on Criminal Laws to consider law reform, there was an important spin-off: a commission of inquiry into New South Wales' practices. England's retreat from the death penalty could only be achieved if the alternative punishment was suitably dreaded, and the fact was that under Governor Macquarie the convict colony was starting to resemble a free society. The task of brutalising the convict experience fell to Commissioner John Thomas Bigge, formerly Chief Justice of Trinidad. Additionally, he had to cut costs (Ritchie 1970, p. 65).

What followed was a suitably 'Bigge' change (Shaw 1966, p. 104). It was reactionary and repressive, and retrenched much of the British state subsidy of the colony. Bigge's recommendations in 1822 resulted in a shift of convict labour from the public to the private sector, the encouragement of the immigration of men with capital to the colony and a tightening of the punitive aspects of the convict system to discourage crime in Britain. Places of secondary punishment within the colony were to be established to discipline a large coerced labour force. Wages were no longer to be paid to convicts, making the labour system seem more like slavery. These changes, together with removing convicts from urban public employment and putting them to rural private work, would, it was hoped, make the punishment of transportation more terrifying and therefore a more effective deterrent to crime in Britain and Ireland. Thus, Bigge helped prepare the ground for major law reform in Britain that would deliver unprecedented convict arrivals from the later 1820s. At the same time, the shift would provide the immigrant capitalists with a labour force. Above all, the economic trajectory of the colony was now beyond mere self-sufficiency and aimed at developing a strong export base. Herein lies the inherent contradiction of the system: if the British subsidy was reduced, the colony needed export staples that if successful would create conditions of prosperity and high wages that undermined the 'dread' of transportation.

Even at its zenith, penal transportation had a rival, and that was the modern prison. The disruption of 1776 had already encouraged judges at the Old Bailey to consider short-term detention as a more credible option, made possible through legislation in 1706. The Penitentiary Act of 1779 proposed the erection of a national prison: it failed to be actioned, but eventually attitudes

would change (Devereaux 1999). A combination of factors contributed to the demise of exile: at the British end, there was growing antipathy to slavery, domestic lobbying for the establishment of prisons, and the emergence of effective law enforcement and detection with the concomitant diminished need for 'a fate worse than death'; at the other end, there was (some) colonial opposition to transportation, and concerns over 'sodomy and self-government' (Reid 2007, ch. 6), but mainly enviable Australian economic growth and the intoxicating discovery of gold in 1851. Within the success of penal transportation as an agent for reform and an engine of growth lay the seeds of its own destruction (Meredith 1988). From them had sprung a luxuriant garden that meant Hell's gates looked too welcoming. Transportation had apparently lost its dread despite – or because of – the best efforts of Bigge and others. Australia was not a gulag; rather it was a functioning market economy with a strong demand for labour (Dyster 1979).

Penal transportation ended, repeatedly. Each time induced a prison building boom in Britain, and a stiffening of punishment in Australia. First, transportation ended to New South Wales in 1840. Bigge's job had been to make transportation more akin to slavery; by 1840, in a different political environment, it was the accusation of slavery that would end transportation to New South Wales and demand its reform in Van Diemen's Land (later Tasmania) (Ritchie 1976; Brand 1990). In theory, the Assignment system would be replaced by Probation, which was a system of 'voluntary' labour contracts (Meredith & Oxley 2005). Perversely, the turn away from 'slavery' actually made the system more brutal, as prior to signing an annual contract, (male) convicts had to serve a term, determined by their length of original sentence, of public labour in a gang designed as enforced training and acculturation to the colony.

Ending transportation to New South Wales did not slow the flow. Although London judges did start to reduce their reliance on deportation, the total number of offenders continued to grow, peaking in the 1840s. Then, in 1853, with eastern Australia in the throes of the gold rush, transportation to Van Diemen's Land was stopped. Britain relinquished its addiction to transportation. The Penal Servitude Act of 1853 converted sentences of transportation into imprisonment at home, but Britain lacked the capacity to incarcerate as many as it had exiled. The solution was to change the law. The Criminal Justice Act of 1855 returned larceny to summary jurisdiction, delivering thieves into Houses of Correction for a matter of days, weeks or months, rather than the years of enforced labour typical for those banished to Australia. Transportation to Western Australia lingered on at the behest of

labour-hungry landowners. Only when the *Hougoumont* sailed into Fremantle harbour on 9 January 1868 did transportation truly end.

Around half a million British people were sentenced to penal transportation over the life of this policy. Over 225 000 were eventually banished – more than 70 per cent of them to the Australian colonies – while the remainder served some time in floating ‘prison hulks’ or local gaols, judged too old, too young or too sick to send abroad (Shaw 1966, p. 150). Critical shortages in shipping, particularly during wartime, also prevented exile. Not everyone sentenced to transportation was sent and there was thus scope for selection in determining who arrived on colonial shores. It has been argued that every available female was transported because of the acute sex imbalance (Summers 1994 [1975], p. 268). The changing nature of law and punishment, the stresses in the British economy and society, the happenstance of whose crimes were detected, prosecuted, found guilty and sentenced to exile, and the ultimate decision of who was selected to be sent, provide a series of critical junctures shaping the peopling of white Australia.

Across 80 years, 681 vessels made 1024 journeys – mainly from the United Kingdom, but from other parts of the Empire as well – carrying over 163 000 convicts, to three Australian colonies: New South Wales (1788–1840, with some in 1849); Van Diemen’s Land (mainly in 1818–53, but with a few in 1804 and 1812) and Western Australia (1850–68) (Bateson 1969 [1959]). New South Wales’ boundaries then included the smaller specialised settlements of Moreton Bay (Queensland), Port Phillip (Victoria) and Norfolk Island. New South Wales and Van Diemen’s Land received 85 000 and nearly 64 000 convicts respectively. Western Australia was late on the scene: teetering on the brink of failure, and desperate for labour, the Swan River colony requested and received nearly 10 000 convicts (Appleyard 1981, p. 213). Everywhere the convict flow was dominated by men and boys, who accounted for 85 per cent of convicts to New South Wales, 80 per cent to Van Diemen’s Land and 100 per cent to Western Australia, as shown in Figure 5.2. This gender discrepancy could not have been foreseen when transportation was first conceptualised in 1718, at which time women constituted some 40–50 per cent of defendants in cases at the Old Bailey. It has been argued that from this time, women ‘vanished’ from the criminal justice process (Feeley & Little 1991). When the First Fleet sailed, female indictments were down to 23 per cent; when the last transport sailed, the figure was just 16 per cent. This highlights how Australia’s character and development were fundamentally shaped by the British courts.

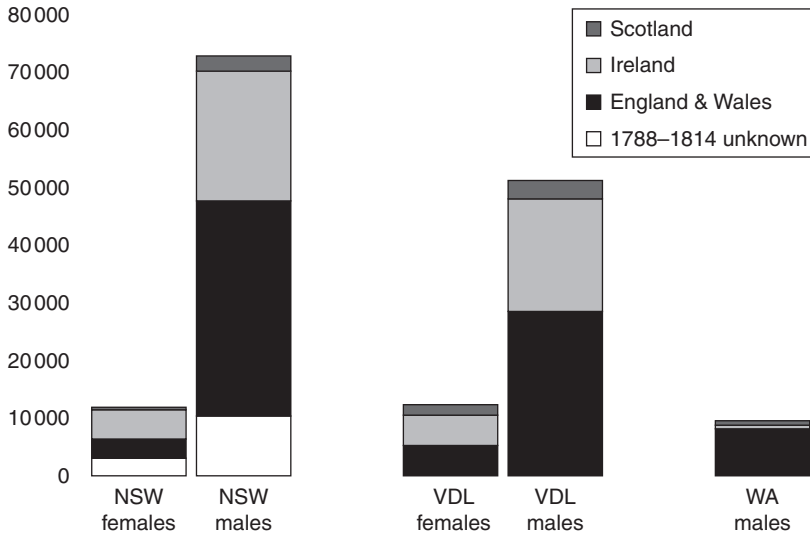


Figure 5.2 Convict origins and destinations

Note: New South Wales and Van Diemen's Land origins by place of birth; Western Australia by place of trial.

Source: Meredith & Oxley (2013). Modelled on 82 296 convicts.

The convicts

Much is known about these 'unwilling emigrants' (Hasluck 1959). Rich records documenting convicts and colonial society were kept by the colonial bureaucracy. Of particular importance were the 'convict indents' or ships musters, a proto-passport that provides invaluable information on each individual compiled at each stage of the process, from committal in the United Kingdom to arrival in Australia. In the colonies, Governor Arthur in Van Diemen's Land was the most proactive record collector, keeping track of his charges through a 'conduct register': these replicated some information from the indents – physical description, crime and sentence – and augmented these with reports on colonial experiences of employment, discipline and release.

Such records have proved important resources for family historians, but offer an even greater boon to academic research through providing a detailed description of the non-elite population from which a new nation was built. Lloyd Robson and John Williams were pioneers in building large databases from the indents and registers, respectively, and Bryan Gandevis used indents to examine boys' welfare, commencing a long tradition in anthropometric research (Robson

1965; Williams 1994; Gandevia 1977; Nicholas & Steckel 1991; Nicholas & Oxley 1993). The advent of accessible computing enhanced the scale of data collection and analysis. The collaborative study *Convict Workers* exploited a Fortran-based data set of nearly 20 000 transportees and *Convict Maids* one of nearly 7 000 convict women, arriving in New South Wales between 1817–40 and 1826–40 respectively (Nicholas 1988a; Oxley 1996). Eighteen thousand labour contracts for Van Diemen's Land have been examined (Meredith & Oxley 2005). The team of the Founders and Survivors project is now engaged in cutting-edge research, linking colonial record sets – indents, conduct registers, births, deaths and marriages, labour contracts and Police Gazettes through to army enlistments – in order to create a long-run demographic history of convict Tasmania (see <http://foundersandsurvivors.org>). Colonial records are also being linked backwards to the Proceedings of the Old Bailey (see <http://www.oldbaileyonline.org>) in a new project entitled the Digital Panopticon (see <http://www.digitalpanopticon.org>). The authors' Convict Database now comprises more than 87 000 individuals sent to New South Wales, Van Diemen's Land and Western Australia, over half of all those transported (Meredith & Oxley 2013). This chapter presents the results for the first time, weighting the data to reconstruct the entire convict population in order to estimate national figures for crime, occupations, age, literacy, and geographical origins.

The convict indents describe horrible crimes, of carefully planned rapes, callous murders and sickening child abuse. These are not, however, a fair representation of the crimes of most convicts (Figure 5.3). The criminal law evolved with a focus very much on protecting property and repressing dissent. Violent offenders were comparatively few in number. Crimes of violence and robbery (theft with real or threatened violence) each accounted for 8 per cent of males; convict women turned to robbery (11 per cent) but as many were sent out for vagrancy as violence (just 1.5 per cent each) (Meredith & Oxley 2013). A small proportion were guilty of riot and political protest, others of combining in labour unions (Rudé 1978). But most convicts were simply 'takers': as Figure 5.3 shows, three-quarters of convicts transported had committed non-violent property crimes (the proportion was slightly higher for females). This included burglary, shoplifting and picking pockets, but overwhelmingly Australia's felons were convicted for common larceny – stealing – and the related offences of pledging and receiving stolen goods. Even among Western Australia's convicts – many of whom arrived after law reform in 1855 had restricted exile to a narrower range of more serious offences – six in every 10 were transported because they took property belonging to others without the threat of violence (Meredith & Oxley 2013).

The convict economy

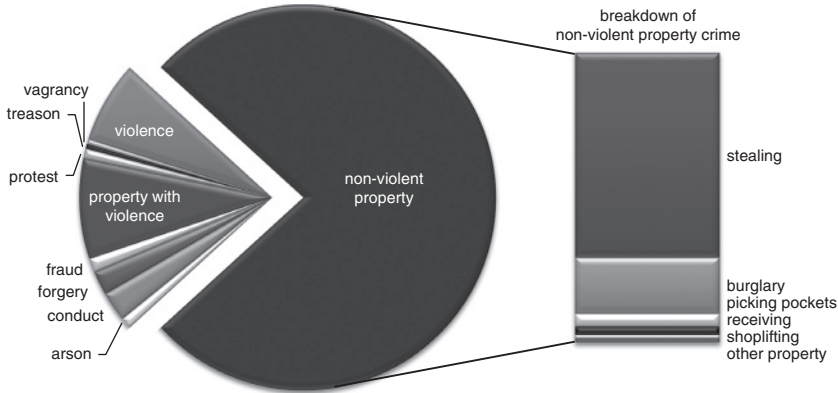


Figure 5.3 Convict crimes

Source: Meredith & Oxley (2013). Based on the crimes of 75769 convicts.

Considerably more than one-half of all transportees were sent out for their first recorded offence (Meredith & Oxley 2013). Transportation was thus a very big stick indeed for the repression and deterrence of law breaking in Britain, applied most freely to small-scale property offenders.

Convict origins and moral character have provided the focus of the most vociferous debate in convict history. At the beginning of the 20th century George Arnold Wood shattered the historical silence imposed by the 'convict stain' and shocked the Royal Australian Historical Society with the revelation that convicts were 'more sinned against than sinning'. Convicts, he insisted, were victims of economic dispossession:

Blustering ruffians of the Bench hanged as many of them as their notions of decency permitted, and those who could not, in their opinion, decently be hanged, they branded with the convict brand and shipped to 'Botany Bay'.
(Wood 1922, pp. 181–2)

Wood's evidence was, however, scant. Three decades later, armed with a small sample of convict indents, Manning Clark argued for a more scurrilous and disreputable beginning to convict Australia (Clark 1956; Shaw 1966, pp. 146–83). With multiple works, a new orthodoxy emerged (quite like the old convict stain) that cast convicts as the most reprobate of a British professional criminal class. In addition to being criminal, these individuals were cast as urban layabouts, drunken, idle, ill educated and immoral – poor material for the founding of a colony (Schedvin & Schedvin 1978; cf. Dyster 1991).

Outer circle = 1841 English population

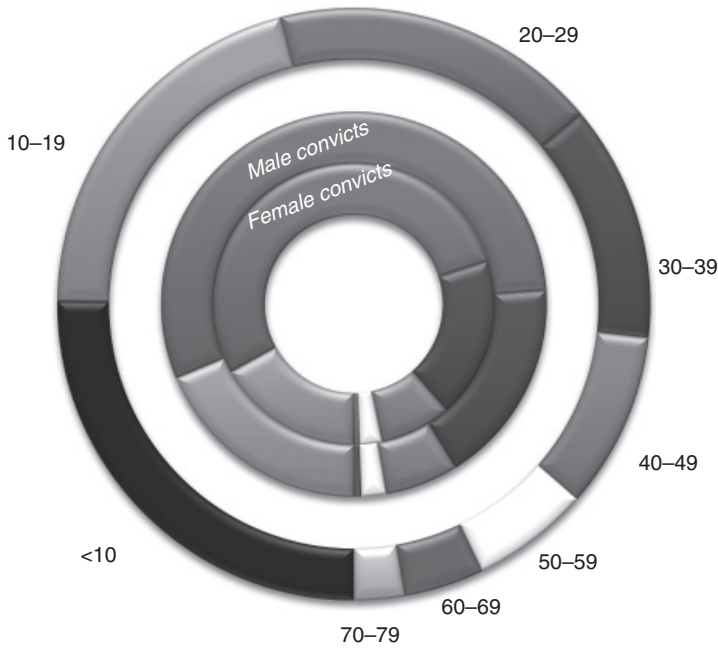


Figure 5.4 Convict ages on arrival

Source: Meredith & Oxley (2013). Based on 80 598 convicts.

Concerned not with morals but with human capital, *Convict Workers* deployed its large data set to reconcile the obvious tension in the literature: if convicts were such poor specimens, why was colonial economic growth so successful? The answer lay in a reappraisal of the quality of convict labour: male, young (rather similar to a university population: see Figure 5.4), literate (Figure 5.5), skilled (Table 5.1) and adapted to migration; and in the colony this labour was efficiently directed, only judiciously lashed, and from the perspective of private employers, was cheap, subsidised as it was by the British state (Nicholas & Shergold 1988e). Convicts provided infrastructure and a workforce, both supporting private entrepreneurs. These were controversial findings, and robust debate ensued, particularly over the efficiency of the labour market (which remains unresolved) and over the nature of coercion (Shlomowitz 1990; Nicholas 1991; Evans & Thorpe 1992; Maxwell-Stewart 1997, 1998). Nonetheless, the new orthodoxy appears to accept that the ‘convict settlers sent to New South Wales were ordinary members of the British and Irish working classes’ who occasionally stole (Nicholas & Shergold 1988c, p. 82).

The convict economy

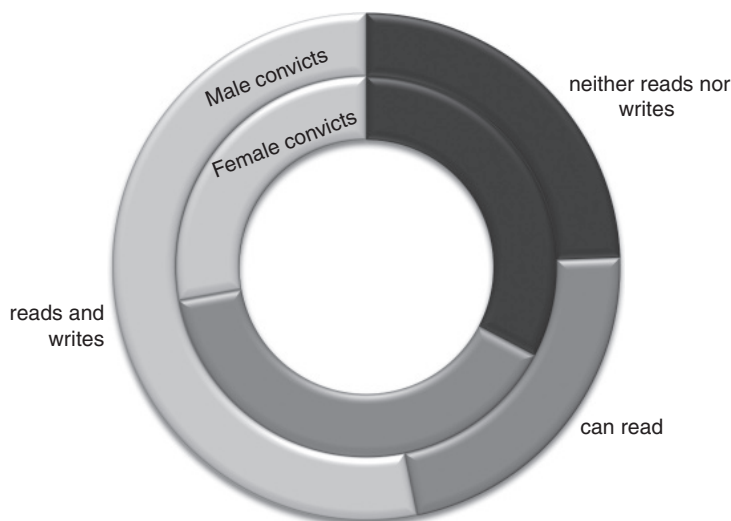


Figure 5.5 Convict literacy on arrival

Source: Meredith & Oxley (2013). Based on 66 891 convicts.

It was wrong to dismiss convicts as essentially urban with few relevant rural skills. The place of trial was inevitably a town – this is where the Assizes and Quarter Sessions Courts met – but that did not mean individuals lived and worked there. A study of United Kingdom trades reveals that many convicts arrived with a country background. Table 5.1 shows the distribution of convicts' occupational backgrounds in descending order. The first 30 of 3370 different trades listed on the convict indents accounted for nearly 65 per cent of transportees. Among their ranks were farm labourers and servants, and ploughmen and shepherds, with many 'labourers' likely to come from farming backgrounds too. This was a healthy menu of skills and experience offered to the convict economies. Above all it denoted an adaptable workforce (Raby 1996, p. 47). Note, however, just two 'makers' on the shortlist: shoemakers and brickmakers. Britain chose not to exile its factory workers. What it created in Australia was an 18th-century-style economy capable of developing into a primary producer, not a rival industrial power.

Coerced labour

Convicts were 167–168 cm (males) and 155–156 cm (females) in height (measured from those aged 24 years or over), about the same as the British and

Table 5.1 Convicts' trades in the United Kingdom

Trade	Number	Percentage of trades
labourer	26 105	18.5
farm labourer	12 171	8.6
housemaid	5344	3.8
farm servant	5015	3.6
ploughman	4577	3.2
shoemaker	3231	2.3
groom	2764	2.0
errand boy	2619	1.9
tailor	2352	1.7
weaver	1984	1.4
butcher	1729	1.2
country servant	1683	1.2
cook	1579	1.1
house servant	1425	1.0
servant	1404	1.0
all worker	1353	1.0
carpenter	1249	0.9
indoor servant	1234	0.9
laundress	1208	0.9
seaman	1200	0.9
soldier	1177	0.8
baker	1091	0.8
nursemaid	1069	0.8
blacksmith	1051	0.7
shepherd	1049	0.7
carter	1039	0.7
brick maker	1026	0.7
bricklayer	894	0.6
gardener	837	0.6
kitchen maid	812	0.6
Total of top-30 trades	90 273	64.1
Remaining 3340 trades	50 624	35.9
Total (trade recorded)	140 897	100.0
No trade recorded	8398	
Total convicts	149 295	

Source: Meredith & Oxley (2013). Modelled on the UK trades of 80 465 convicts.

Irish populations from which they were drawn (Nicholas & Shergold 1988c, p. 80). They were also, except in the very early years of white settlement, remarkably well fed. The minimum convict ration was laid down by the

colonial authorities to be followed by private employers of convict workers and also applied to those labouring on public works. The principal feature of the convict ration was the amount of meat it contained: 1–1½ lbs. (0.45–0.68 kg) *per day*. With flour and vegetables this ration supplied daily energy of between 3900 and 4900 calories. This was definitely not the norm for the British working class at this time (Meredith & Oxley 2014). Not only was this well above what convicts were used to in Britain or Ireland, but it was also more than adequate for the work they were required to do. It seems likely that accommodation, clothing and medical care were superior to the average experienced by working people in the United Kingdom. Nor were the convicts overworked: the official working hours varied with the season, but averaged nine hours a day for six days a week. This was certainly no more than workers in the United Kingdom performed. Most convicts, then, were young, physically robust, and fed well enough to work hard (Nicholas & Shergold 1988e).

But did they want to? The treatment of convicts must be seen in the context of a coercive labour system that was not benignly accepted (Atkinson 1979). If convict workers were usually less productive than free labour, this was often a result of their coercion rather than a reflection on their innate abilities, physical strength or range of skills: once freed of their shackles, emancipists (time-expired convicts) were not inferior to other free workers. Unlike other immigrants, convicts came to Australia under duress and were forced to leave behind their home and family. There was a price in human suffering to be paid for Australia's convict workforce. The threat of violent punishment of convict workers was always present, reinforced in everyone's mind by the harsh conditions of cruelty and brutality meted out at the penal stations and places of secondary punishment: the Female Factories, Hyde Park Barracks, Newcastle, Wellington, Port Macquarie, Moreton Bay, Macquarie Island, Port Arthur and Maria Island. Minor breaches of work discipline were invariably followed by sanctions and repeated offences by corporal punishment (see the chapters by Damousi, Maxwell-Stewart, O'Connor and Reid in Duffield & Bradley 1997; Evans 2007, ch.2; Cowley 2008; Liston 2008; Maxwell-Stewart 2008). The Bigge Report specifically recommended increasing the physical severity of convict discipline (Great Britain 1822; Dyster 1987; Evans 2009). Nicholas claimed the lash was 'used judiciously' and estimated that 'roughly two-thirds of all convicts received one or no floggings during their sentences' and that 'the lash was no more widespread in convict Australia than in the English army or navy' (Nicholas & Shergold 1988e, p. 181). Whilst this might be accurate, it meant that convicts were forced to work in a similar manner

to free workers but were subject to rules and regulations and discipline normally imposed on military and navy personnel. Convicts yearned for freedom and the majority realised the quickest way to the coveted ticket-of-leave or probationary pass was to stay out of trouble as much as possible. Regular wages at relatively high levels beckoned, but surely one of the further attractions of attaining freedom was that of being free from penal work discipline and the threat (and in many cases reality) of coercive violence.

The extraction of labour from coerced workers was a challenge faced by all employers of convict men and women. For back-breaking public works in road and harbour construction, a coerced labour force might well have been more cost-effective than the available free workforce, as the decision of the Swan River Colony to request convicts in 1850 illustrated. But depending on the nature of the job, carrots could be more effective than sticks (Hirst 1983, p. 28; Nicholas 1988c). The majority of convicts worked for private employers who could use a repertoire of incentives to extract labour: under the Assignment system, wages were formally used to purchase the labour time of convicts 'on their own hands' (convicts were free to sell their labour after 3 pm) until Bigge put a stop to it, and wages were a key part of the Probation system when it was introduced in 1842; additionally, there is evidence of informal payments being made, and indulgences in the form of extra rations and luxuries. It may be asked whether it was easier, or more difficult, to extract labour from convict servants than free employees. Overarching these considerations, however, is the question of how much choice private or public employers had in obtaining a labour force since they might well be faced with taking on convict workers or no workers at all.

The distribution of labour was in the power of the colonial government. Across different systems the government reserved the right to keep some convicts for its own use and in the years before 1820 this proportion was quite high (Dyster 2007). Following the Bigge reforms, the settlers received a greater share of the available convict labour, though not all of it was made available to them. In New South Wales and Van Diemen's Land before 1840, an Assignment system operated in which settlers made application for convicts and the government responded. Female convicts were allocated by a group of women of lofty social status constituted into the 'Ladies Committee for the Improvement of Female Convicts' (Higman 2002, p. 73). From the late 1820s attempts were made to make the Assignment system more transparent and consistent, to make it less subject to the whims and patronage (some said corruption) of colonial officials and the governor. Largely this consisted of making the number of convicts assigned to an individual applicant dependent

on the amount of land held (Foster 1983). After transportation to New South Wales ceased, a system of allocation was adopted in Van Diemen's Land that allowed settlers to bid for individual convicts who had reached the Probation stage (Meredith & Oxley 2005). At the same time, convict discipline was severely tightened (Boyce 2008, pp. 168–74). Since the supply of convicts varied with the penal machinery in the United Kingdom and demand for convicts with the state of the colonial economy, supply and demand were not necessarily matched.

The second decade of the 19th century marked a significant transition in respect to both labour and land. The successful crossing of the Blue Mountains in 1813 followed by the construction of a road over the mountains two years later fundamentally shifted the land–population ratio for the settler economy (Coghlan 1918, pp. 155–72; Perry 1963, pp. 29–30). A vast area was revealed superior to that of the Cumberland Plain: a relatively well-watered savannah, gently undulating, with better soils and easier to clear. Observers goggled at seemingly aristocratic estates, created by Aboriginal land management (Gammage 2011, pp. 7–16, 187–210; Hunter, this volume). At the same time the long Revolutionary and Napoleonic Wars came to an end in Europe. The end of the war brought much lower agricultural prices in Britain, putting pressure on land rents and ultimately on the rural population. The repatriation of a quarter of a million men from the armed forces raised unemployment. Britain's war debts called for retrenchment in the public finances, including spending on its distant colonies. Rural distress and urban unemployment created a crime wave. The numbers sentenced to transportation increased, and the merchant marine, freed from its wartime duties, provided the shipping. Army and navy officers on half-pay swelled the ranks of potential 'gentleman' settlers. The result was the sharp increase after 1815 in the number of convicts arriving in Australia shown in Figure 5.1. There was now effectively more land and more labour in the colonies.

There were two related questions about economic development to be answered. How could the newly discovered lands be used productively and what could the Australian colonies export to the world? These questions were related because no use could be made of the additional land if Sydney was the only market. These lands were more productive than the original settlement, but grain production was limited by the size of the domestic market. Wheat grown in Australia could not, at this time, be sold profitably in Europe; the costs of production and transport were too high. Meat could be produced in prodigious amounts but it could not be exported except as salted beef or mutton, and the international market for that was not large.

Marine exports were found but they did not offer long-term development. The vast new tracts of territory about to be incorporated into the colonial economy would only be profitable if they could produce a commodity that fulfilled the right criteria: it must have a large and expanding export market, a high value-to-weight ratio, be non-perishable, produced with relatively low labour costs and utilise Australia's only source of comparative advantage, cheap land (Davidson 1981, pp. 77–80). The answer was sheep.

Bigge was attracted by the experiments of Macarthur and others with merino and other breeds of sheep and he was certain where the future direction of the colonial economy lay:

Upon the expedience of promoting in the colony of New South Wales the growth of fine wool, and creating a valuable export from thence to Great Britain, no doubt can be entertained, as it appears to be the principal, if not the only source of productive industry within the colony, from which the settlers can derive the means of repaying the advances made to them from the mother country, or supplying their own demands for articles of foreign manufacture. (Great Britain 1823, p. 18)

The land west of the Blue Mountains was highly suitable for sheep grazing, thanks to Aboriginal efforts. A mild climate meant that sheep could be shepherded all year round, avoiding higher labour costs in winter. The carrying capacity of the land was low at three acres per sheep, but the land was so extensive this was not an insuperable problem. Wool was in strong demand in Britain, it had a high value-to-weight ratio compared with grain and it would not deteriorate on the journey to the port and then across the world by sea. Entry costs into sheep grazing were high at a minimum of £1500, so it was an industry that suited wealthy settlers favoured by Bigge and Lord Bathurst, Secretary of State for the Colonies.

Convicts provided the necessary labour for large-scale wool production at a low cost of food and fairly nominal clothing. Not only was convict labour cheap, but it was also coerced: there was a marked reluctance of free labour to engage in shepherding. The graziers depended on convict labour and as wool production and exports expanded, the labour needs of 'the squatters' increased (Roberts 1935; McMichael 1984). Their demands for assigned convict labour were not fully met and from the mid-1830s they supported schemes to bring in free immigrants whose passage would be paid or subsidised by the proceeds of land sales in the more settled parts of the colony. The assisted immigrants came but showed little inclination to work as shepherds hundreds of miles from Sydney, and convicts remained the main labour force into the

early 1840s when eventually the supply gave out. Even then the graziers were the most vociferous in demanding the renewal of transportation. The ability to direct convict labour into undesirable areas of the colonial economy was one of its key advantages.

Economic growth in early colonial Australia was also enhanced by convicts being forced to build transport links. A substantial part, though a minority proportion, of convict labour was organised in public work gangs (Nicholas 1988c; Robbins 2000, 2004). Coastal and riverine transport required dock facilities but to unlock the wealth of the interior required land transport. Before railways this meant building roads. It is arguable that convict labour was particularly suited to this task. Certainly, it was a major use of convict gangs by the government, which also used work in the road gangs as a form of punishment for convicts who offended in the colony. Some projects were ambitious engineering undertakings, such as the road over the Blue Mountains and the Great North Road from Sydney to Newcastle (Karskens 1986). Many other roads were built by convict labour, often at the behest (and sometimes the financial responsibility) of large-scale settlers. Van Diemen's Land relied on a network of roads to connect the interior of the island to the ports, all built by convicts (Reynolds 2012, p. 142). In their absence, would free wage labour have been able to perform these arduous tasks as efficiently, or at all? Transport bottlenecks might have strangled the colonial economy: that they did not was down to the picks and shovels wielded by convict labourers, a point not lost on the settlers in the Swan River Colony in Western Australia.

The convict economy was not just about labour. Convicts played another role, as consumers. Exports from the convict colonies were difficult to find and the search for one or more 'export staples' continued for some decades before the success of wool exports in the 1830s (Pinkstone 1992, pp. 13–30). Before this staple was developed the economy relied mainly on domestic demand. Apart from personal capital brought by convicts and cashed-up settlers, *all* the expenditure by the British government in New South Wales and Van Diemen's Land was for the purpose of supporting the colonies as penal settlements that were part of Britain's judicial system. This represented a massive inflow of capital by Britain, a huge subsidy as some historians have viewed it, amounting to as much as half the colonies' GDP (McLean 2013, pp. 53–6; Butlin 1994, Part III; Nicholas & Shergold 1988b). Convicts were responsible for a large part of domestic demand through their consumption of goods and services, supplied by the private sector and the government. Convicts required food, footwear and clothing, accommodation, tools and implements, and health care. The government purchased some of the

goods and services it required to maintain the penal settlements through its Commissariat (the government store), paying for them with Treasury bills drawn on London. These in turn financed imports into the colonies. It was this aspect that led some historians to see Commissariat demand, in effect, as an invisible export (Dallas 1949, p. 297). Domestic demand did not rely solely on government purchases for the convict system, however. The European community in Australia had a high propensity for urban living. Australia was distinctive among lands of European settlement for its relatively high degree of urbanisation (Statham 1989, p. 1). This had important and far-reaching economic implications. One of these was the development of urban markets for goods and services from an early stage in the colony's establishment (Butlin 1993, p. 149). Convict and free alike had a taste for imports that remains to this day (Dyster 1978; Butlin 1994, pp. 151–61).

Free labour

It is important to remember that the status of convicts was a temporary one. They became free, over the course of the day ('on their own hands'), over their sentence (on tickets-of-leave) and over their lives (becoming emancipists). Given their age profile and life expectancy, convicts could expect to spend at least twice as many years as a free worker than as a bonded one. Although the formal arrangement whereby convicts could be employed for wages during certain times of the week did not survive the Bigge reforms, the practice went on informally. Moreover, the institution of the ticket-of-leave continued throughout, allowing the majority of convicts the opportunity to work as free wage labour (but with restrictions as to where they worked) from halfway through their sentence. The importance of convicts in the workforce before 1850 can be gauged by examining the adult population over this period. Figure 5.6 shows the growth of the European adult population in New South Wales and Van Diemen's Land divided into those born in the colony, those who came as free (i.e. non-convict) immigrants, emancipists and convicts (Butlin 1994, pp. 34–43). The colonial population grew rapidly after 1815, driven largely by penal transportation until the later 1840s. Between 1800 and 1810 the convict share of the labour force was around 30 per cent and falling. With the surge in convict transportation after the war ended in 1815, the unfree proportion rose quickly to reach a peak in 1825 of 55 per cent, declining gradually to 40 per cent in 1840 and then falling away to 10 per cent in 1850. Thus, for several decades around one-half of the labour force consisted of convict men and women while the remainder comprised free wage labour.

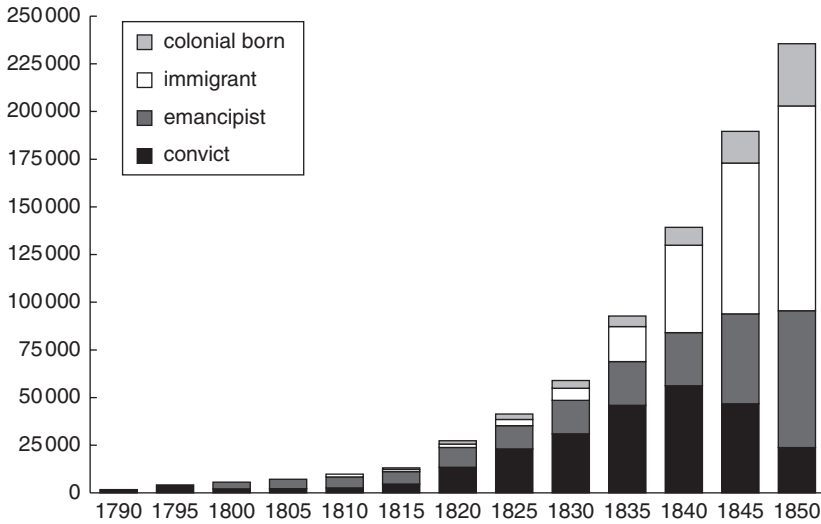


Figure 5.6 Civil status of European population aged 12 years and over in New South Wales and Van Diemen's Land, 1790–1850

Source: Butlin (1994), pp. 37–43.

In addition to contributing to the free wage labour force by becoming emancipists, convicts also created free labour by having children. Just as the convict origins debate swung between extremes, so too have the reputations of convicts as parents. Various they have been our founding mothers and fathers (Robinson 1985) but also reprobates whose children – ‘the currency’ – imbibed vice with their mother’s milk (Macnab & Ward 1962). Anne Summers asked whether the purpose of importing convict women into the colony was sex – the British state as ‘imperial whoremaster’ (Summers 1994) – but Katrina Alford posed an equally tendentious question: were convict women used for production or reproduction (Alford 1984)? Where did the state stand with regard to making families?

This points us towards the second great debate in convict studies: the worth of women. As noted earlier, changing conviction patterns in England were responsible for a tremendous colonial sex imbalance, men dominating in a ratio of nearly six to one, and much higher at specific moments in time. Some thought there were too few women, and Dallas attributed Australia’s failure to develop an industrial economy to the shortfall (Dallas 1949, p. 299). Other scholars judged the pro-male bias a good thing. Single young men cost less than family men, worked hard, built infrastructure and could be

sent wherever needed, furnishing the colonies with an economic bonanza. Women were 'imperfect substitutes' for such men, so the fewer the better (Nicholas & Shergold 1988b, p. 52; McLean 2013, p. 49). Butlin estimated convict men had a 100 per cent labour-force participation rate, but he opted to attribute a 60 per cent participation rate to women 'as a lower bound estimate of the contribution of women to the economy' (Butlin 1994, p. 43). Much hinges on what women did with the other 40 per cent of their time.

In essence, the argument is that women have babies, increasing the dependency ratio, lowering female and overall labour-force participation rates, and hence reducing per capita growth because, under national accounting, the birth of a lamb adds value, but the birth of a child does not. The discipline of economics and the related field of economic history tend to blindness when faced with non-market activity (Snooks 1994) and convict Australia – based on coerced labour and forcible seizure of Aboriginal resources – lay beyond typical market relations. The outcome is that economic activity outside the market frequently remains undervalued and many economic histories of Australia rarely mention convicts, Indigenous people, women or children. The colonial roles of women centred around domestic service in convict-employing households, on farms and in their own homes, underpinning living standards. But the nature of work – such as childminding – that can take place with labour that is paid, coerced, or provided by family problematises concepts such as workforce participation. Wages are not the only key to understanding what work was economically beneficial.

In most societies, for most people, it is families who share resources, supply labour, produce and purchase goods and services, and most of all, make babies and shape the demographic fortunes of a nation. Alford's question was how this was achieved in the context of a convict society. Convict women, like convict men, could labour at many tasks, but as childbearers women occupied a niche. But what was the expectation of the colonial state in this regard? Official attitudes to marriage and reproduction varied by colony and over time. Opportunistically, in the early days of settlement, some convict women argued that marriage made them free; while it took the authorities some time to clarify this (in the negative), marriage does seem to have led fairly regularly to assignment to the woman's husband, which might be deemed a freedom of sorts (Aveling 1978). Initially, marriage was widely encouraged as families were seen as civilising and part of the colonial project, and Governor Phillip had various proposals for importing women to be wives (Kociumbas 1992, pp. 17, 23–4). Women and children were regarded as God's Police who kept men honest and hardworking (Summers 1994).

Even so, marriage was not a right. Licence to marry was an indulgence used to elicit good behaviour from convicts. Attitudes changed. A normal family life in the colony looked inconsistent with transportation as a dreaded punishment, and it was more closely monitored after Bigge, and tightly rationed by the later stages in Van Diemen's Land (Reid 2007, pp. 132–54). The tension between production and reproduction came to a head in the treatment of single mothers. Pregnancy during servitude was an offence, and pregnant servants were returned to the Female Factories and punished. The treatment of women and their babies in Van Diemen's Land was nothing short of brutal, and left many infants dead (Ryan 1990). These were not the actions of a colony set on natural increase. Whatever the latter's merits, penal objectives came first, particularly when they went hand in hand with colonial employers' preferences for 'unencumbered' workers.

Making families is not a private indulgence, but a long-term economic necessity whose value can be measured in the costs imposed by its absence. The restriction of family formation in colonial Australia inflicted harm. The shortage of women and reluctance to finance family formation – by both the state and employers – fostered Australia's long-held addiction to importing the adult labour it needed, leaving labour shortage a recurring theme, especially with unfulfilled demand for women workers. Fewer women and children meant the domestic market was constrained, not least for housing and consumer durables. It limited the development of educational provision, contributing to inferior rates of human capital among the colonial born (McCalman & Kippen 2013). It reduced available aged care. Employers became fixated on an unrealistic cost structure based on a single male wage. Social order may or may not have been more fragile, but overwhelming youthful masculinity often increases brutality. And there was a cost to those young men, a majority of whom could never hope to have their own wife and family. Celibacy, masturbation, prostitution and homosexuality featured more prominently on the colonial sexual menu. So did sexual assault, of each other, women, children and animals. Frontier relations must have been partly shaped by these tensions (Levine 2004, p. 139). If the appeal of empire was sexual opportunity, Australia was its antithesis (Hyam 1990).

An illustration of the demographic effect of the skewed sex ratio and inconsistent attitude to families in the colonies was that the free labour force depended more on time-expired convicts than on the colonial-born (Figure 5.6). Australia hungered for immigrants. Free immigration depended on convict labour for the subsidies paid to assisted immigrants and the 'cheap land plus cheap labour' package offered to attract wealthy settlers.

The presence of convicts in the labour market might have had a depressing effect on free wages. Alternatively, within an internal labour market, cheap convict labour may have financed the purchase of more expensive free labour. The colonial economy thus exhibited a split personality: cheap coerced labour was supplied alongside relatively expensive free-wage labour in roughly similar proportions. This may explain why British people were interested in emigrating to Australia, but it also meant that those forced to emigrate as a result of their crimes were being dispatched to an economy which valued labour even more than in industrialising Britain. Once free, a convict could look forward to a lifetime working at relatively high wages: as a result few emancipists chose to return to Britain or Ireland. Good prospects bought obedience and cooperation, albeit under duress. What was not guaranteed was a family.

Legacies

The convict stain obscured the view of convicts as the founding parents of the white nation, but that is who they were (Smith 2009, pp. 2–11). Had Botany Bay not been chosen, or had the modern prison triumphed over penal transportation as it appeared to have done with the passing of the 1779 Penitentiary Act, Australia would have a very different history. Were there any long-term legacies of the convict system in Australia's economic history? Certainly. To begin with, Australians speak English, the British monarch is the head of state, there is a strong Irish Catholic tradition and the police are armed.

A major legacy is the nature of the economy and infrastructure. The contribution of the convict system to Australia's early economic growth was prodigious. Substantial increases in the supply of labour and land following the end of the Napoleonic War kick-started economic growth. Growth was perpetuated through the supply of very favorable convict labour, the expansion of free labour and the provision of capital through British government subsidies, all made productive when mixed with Aboriginal land. The convict labour force was largely responsible for building what transport infrastructure existed before the railways, much of it still evident today. Many convicts seized whatever economic opportunities came to hand, and a few became prominent entrepreneurs (Ville, this volume).

From the start, white Australia was keenly integrated into the global economy. This would prove a rocky ride, as the depression of the early 1840s showed (Dyster 1993). Domestic demand was mainly dependent on British

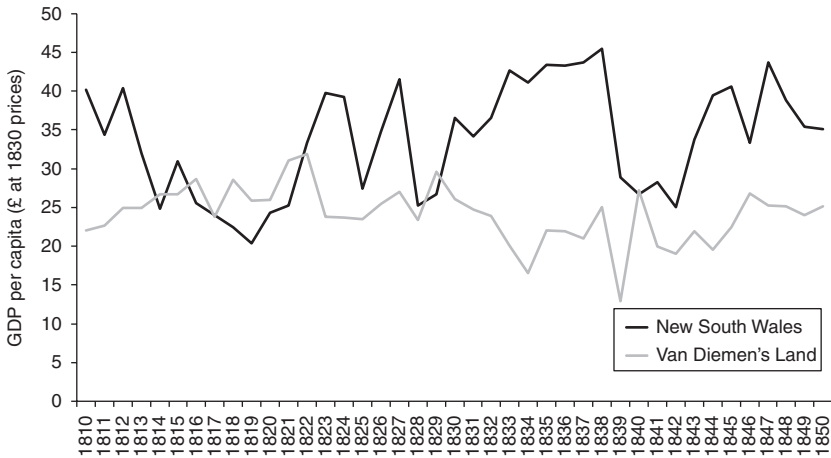


Figure 5.7 Real GDP per capita in New South Wales and Van Diemen's Land, 1820–50

Source: Butlin (1994), p. 201.

government expenditure through its Commissariat, which in turn provided the foreign exchange to finance the insatiable demand for imports that persists to the present. But the colonies were vulnerable to sudden shifts in Britain's penal practices: every time there was retrenchment in transportation (and therefore labour and the subsidy) it set off a flurry of anxiety. They needed to find a suitable export staple, eventually succeeding spectacularly with wool, a development which employed mostly convict workers.

Vigorous economic growth, however, did not necessarily translate into real growth per head (Figure 5.7). There were some periods of rapid expansion. Yet those of decline were equally frequent and steep. Technological innovation that should have been encouraged by relative labour scarcity (as happened in North America) was stymied by the existence of a large body of unfree labour. Growth in the colonial economy depended primarily on adding more units of production, land and labour, not productivity increases arising from new technology. Manufacturing remained at a small workshop level and in the rural sector farming methods were more labour-intensive than in Britain (Raby 1996; Linge 1979, p. 85). Australia was stuck in an 18th-century world.

European Australia was born pre-industrial, setting it on a long-term trajectory towards primary production, not industrial development. The convict economy period in Australia coincided with Britain's Industrial Revolution,

the world's first. The United Kingdom's population grew at unprecedented high rates. Industrialisation created massive changes in Britain's occupational and locational structure. It uprooted workers from agriculture, traditional hand-manufacturing and established services, producing both rapid urbanisation and emigration. There was a high and rising level of internal mobility in Britain and Ireland that was reflected in the migratory experience of many convicts. These forces were felt on the other side of the world as flows of people, both immigrants and convicts. Many of the skills these people had were ones being discarded in Britain, but demanded in Australia. The Industrial Revolution in Britain also presented Australia with an opportunity to develop a staple export, feeding the expansion and mechanisation of Britain's woollen textile industry from the 1830s. Fortunes were to be made from fulfilling Britain's demand for raw wool, but the large-scale settlers who sought to grow wealthy in this way required land, labour and transport infrastructure. The convict economy responded by supplying all three. Australia grew rich riding on the sheep's back, and the convict shepherd's legs.

A ready-made coerced labour force underpinned the marked reluctance towards the employment of Aboriginal workers on ordinary free-labour terms (McGrath 1995, p. 23). This impacted on Aboriginal labour and society: dispossessed, not integrated into the economy, and marginalised, making their communities vulnerable to massacre (Butlin 1994, pp. 210–22; McGrath, Saunders & Huggins 1995; Goodall 1996; Lloyd 2010; Ryan 2010, 2012). Scottish Highland Clearances offered one technology of dispossession justified by 'civilization' conquering 'savagery' (Greig, Lewins & White 2003, p. 166). More convict men on the frontier in Van Diemen's Land, however, may have reduced Aboriginal deaths in the Black War because convicts were disinclined to sacrifice their lives in defence of their masters' property (Ryan 2012, p. 145).

The gender imbalance among convicts certainly influenced immigration policy to attempt redress and perhaps shaped attitudes to women in colonial Australia in a broader sense. Some have claimed it gave rise to a macho Australian culture (Summers 1994; Dixson 1984; Evans & Thorpe 1998). The low level of family formation built a tradition of importing skilled labour rather than developing the institutions – family, education, health – needed to produce it in Australia. Immigrants flocked to Sydney and Hobart where they found urban life and work more conducive than pioneering in the bush. Convicts forced to work in the countryside mostly drifted to the towns when they attained freedom, pushing Australia to a high level of urbanisation. It would have been higher still had the state not directed convict labour to the rural sector.

The achievement of colonial self-government was dependent on ending penal transportation (which was one reason its abolition was demanded by some sections of the colonial polity) but a wider case can be made for the influence of the convict era on the role of the state in the 19th century. Did 'colonial socialism' and demand for democracy find their roots here? The relationship between master and servant in the convict economy fostered fierce independence by those who became free or came free, but at the same time did it encourage employers to think in terms of binding contracts with free workers? Nicholas and Shergold argue that a labour aristocracy was imported into Australia from Britain by the convict system (Nicholas & Shergold 1988a); if correct, this might be viewed as having long-term implications for the Australian labour movement. Certainly, the scene was set for unprecedented levels of government interference in labour relations, including master and servant legislation (Quinlan 2004). In keeping with the Old Poor Law inherited from Britain, living standards would be underpinned through work, not welfare: the Harvester Judgment of 1907 has convict origins.

Australia is not the only country with a history of dispossession, indigenous depletion, and coercion, but it is the only one ever founded on a penal practice based on all three. Transportation's fingers stretched far – the last convict, Samuel Speed, died in 1938 – and perhaps further still (Gardiner 2009). Yet this paradoxical institution that framed the invasion of Australia remains elusive, perplexing, full of unresolved contradictions. Transportation moved Great Britain off the death penalty but it inaugurated an era of more punishment for minor crime: was this advance? It forcibly moved thousands of people from countries marked by excess population and food shortage to lands of abundance, economic opportunity, but also the lash. Was a full belly and full employment in the colonies better than hunger and unemployment at home with family? The humanitarian costs and benefits of penal transportation are enormously complex and contentious. Less equivocal are the economic outcomes. By 1853 the convict economy in eastern Australia may be judged to have exceeded expectations. The economy thrived on Aboriginal lands, British finance and a constant supply of British and Irish labour. Any economic success it had was due to the qualities of the people transported and their deployment in the colonies, both as convicts and as free workers. From these efforts was built a viable, albeit pre-industrial economy. This was not the best of all possible worlds, but it worked. Whatever the question – why invade? why grow? why end? – the answer was convicts. Butlin was right.

PART 3



ECONOMIC EXPANSION OF THE
COLONIES

Technological change

GARY B. MAGEE

Technological change is a core component of modern economic growth. Its transformative impact on economies and societies, past and present, is well documented. As Mokyr (1990, p. 3) has noted, it has been, and remains, ‘one of the most potent forces in history’, offering societies across the globe ‘what economists call a “free lunch”, that is, an increase in output that is not commensurate with the increase in effort and cost necessary to bring it about’. Madsen’s analysis of economic growth in Chapter 2 of this volume confirms that such productivity-enhancing technological change, both domestically and externally derived, has played an important role in Australian economic development. Over the course of the 19th century, virtually all aspects of life in Australia were transformed by the advent of new technologies and ideas. Originally a subsistence agricultural economy, whose very existence at the beginning of the 19th century was tenuous, Australia by the end of that same century had become an affluent, modern society, closely integrated into the world economy. Yet its success had hardly been inevitable. The practicalities of Australia’s early development posed elemental technological challenges. How would settlers build a viable and adaptable technological system largely from scratch? What would drive their technological creativity, and in what fields and by whom would it be focused? And, assuming that a global technology shelf even existed, how could they most effectively access it? This chapter takes up these and other fundamental questions about Australia’s technological development between the beginnings of European settlement and Federation.

Patterns of Australian technological change

Technology is the body of practical knowledge and methods used in production and consumption. It tells us how different raw materials, equipment and skills can be brought together to yield a desirable outcome and extend

an economy's production possibilities. Given that human needs, wants and knowledge constantly evolve, it is also a concept whose characteristics and nature alter across time, location and industry. Understanding how technology changes thus requires not just familiarity with the technologies themselves but more importantly knowledge of the circumstances in which they arise, flourish and eventually become redundant. Technological development cannot be extricated from its history.

From its beginnings, colonial Australia's technological experience has been intimately tied to its distinct historical context. The exploration, opening up and settlement of Australia brought the European colonist into contact with an alien environment that challenged their very existence. Here, the accumulated knowledge of Aboriginal people proved decisive, especially in the early decades of settlement, and remained influential throughout the century (Richardson 2004, p. 3; McLean 2013, p. 42; Hunter, this volume). The Coolgardie safe, an easily constructed, yet highly effective, meat safe made of wood, gauze and hessian and widely used in inland towns and on sheep stations until the advent of affordable ice chests, provides an example of that influence. Developed to meet the requirements of life in a hot, dry land of vast proportions, its design was apparently inspired by the Aboriginal practice of sewing kangaroo skins together to make a carrier (Renew 1993, p. 31).

Soon after arrival, settlers realised that technologies and farming practices that had worked well in Britain ceased to do so on these new lands. Growing seasons and climatic patterns did not match with experience. Even the manufacture of basic commodities could be challenging until mastery of the local resource endowment had been achieved. Thus, until deposits of good quality limestone were found in New South Wales, the lime used in early building mortar had to be obtained by burning oyster shells that had washed up onto the shore. Similarly, the early settlers substituted the cabbage tree palm for straw in the making of their sun hats, while the Australian leather goods industry awaited the invention by Thomas Kent in 1819 of a process of extracting tannin from wattle bark before it could flourish (Richardson 2004, p. 4; Renew 1993, p. 25).

For those who sought more than survival, the challenge was not just to find substitutes for materials used in Europe, but to discover productive uses for the abundant, if distinctive, resources that surrounded them. Take the case of Joseph Bosisto, who experimented for many years with the oils of the native eucalyptus, wattle and tea tree, which he believed could find markets either as food flavouring or medicine. His intuition proved right; by 1882 the

Eucalyptus Mallee Company he founded was exporting eucalyptus oil to the world on a large scale (Renew 1993, p. 37).

Agricultural technology too required adaption to the Australian environment. Australian soil was often deficient in phosphorous and nitrogen and early pioneers, such as the Correll family of the Yorke Peninsula, developed techniques of applying fertilisers in an economically efficient manner. The demonstration effects of their successful experiments with seed drills and superphosphate and their active engagement in community groups and agricultural societies encouraged large numbers of normally conservative farmers to take up the new technologies. Many at the time felt it was the salvation of Australian wheat growers (Frost 2001). Elsewhere in South Australia, the stump-jump plough, a quintessential Australian technology, was developed in 1876 to enable freshly cleared land containing thick roots and mallee lignotubers to be more efficiently worked. Mallee roots posed a serious problem to the extension of agriculture in eastern South Australia, north-western Victoria and central New South Wales. Usually credited to Richard Bowyer Smith, this invention's solution was to hinge the share and the mouldboard of the plough in such a manner that whenever they came in contact with a root or some other obstruction in the ground, they automatically rose, their weight returning them to work once more after the obstacle had been passed. The stump-jump principle became a standard feature of most subsequent plough designs (Birmingham, Jack & Jeans 1979, pp. 18–21).

The unifying characteristic of these innovations, which represent only a minute fraction of the technological creativity exhibited in 19th-century Australia, was that they all constituted attempts by the new European inhabitants to come to terms with, and make full productive use of, the land they had occupied. The technology adopted, developed and diffused also reflected the underlying factor endowment of scarce capital and labour and abundant land, a combination that encouraged labour- and capital-saving and land-intensive production methods (Frost 2001, p. 217). An important example of this tendency was observed in the wool industry. By letting sheep run illegally onto the expanses of Crown land, early pastoralists could operate profitably by deploying virtually no fixed capital; moreover, they used assigned convicts as an inexpensive source of labour (McLean 2013, pp. 59–62).

By nature, these technologies associated with territorial expansion tended to be largely adaptive, resource-related and 'low-tech'. New technological ideas, borrowed or otherwise, rarely arrive fit for purpose; they inevitably require protracted innovation and experimentation on site to make them suitable for local conditions. Without this seemingly low-level tinkering or

‘creative adaptations’, as White (1992, p. 157) has called them, much of the successful opening up of the productive lands of Australia would not have occurred. It was the coupling of geographical expansion with such slow technological accumulation that kept the rates of return on physical, financial and human capital in Australia at levels that served to induce further foreign investment and immigration to its shores.

With the advent of the gold rush and self-government, colonial administrations began for the first time to seek out an institutional framework that would efficiently marshal natural and human resources for the dual tasks of exploration and development. The most important institution designed to promote technological development in the colonial period was the patent system. Arthur Otto Sachse, a Member of the Victorian Legislative Council, expressed the prevailing view of patents nicely in 1893:

In all civilized communities it had long since been recognized as both fair to an inventor, and beneficial in a very high degree to the State, to enshroud any really new and useful invention with proper legal clothing, not merely for the purpose of protecting the inventor, but also in order to offer a spur or inducement to others to come forward and still further improve the conditions of mankind. (quoted in Magee 2000, p. 14)

Prior to the establishment of the Commonwealth Patent Office in 1904, however, there was no unified patent system. Each colony, while framing its legislation on the United Kingdom precedent, operated independently, meaning that an inventor wishing to protect an idea right across Australia was compelled to file an application in each of the six colonies. This requirement was costly and put at risk the inventor’s intellectual property. This was because in applying for patent protection in any one of the colonies, the inventor was required to disclose the nature of their invention publically, thereby providing someone in another colony with an opportunity to appropriate the idea and patent it themselves in that jurisdiction before the first and true inventor could. The ideal solution was to patent in all systems simultaneously. Where such a strategy was beyond the means of an inventor, a single patent was typically taken out in what was perceived as the most important market for the technology, invariably New South Wales or Victoria, and left unprotected elsewhere.

Records relating to patenting form an important source of information about technological history. Read with care, they shed unique quantitative light on a range of aspects pertaining to a society’s supply of new technological ideas, both of domestic and foreign origins. Among other things, they enable an overview

Technological change



Figure 6.1 Australian technological effort, 1857–1903 (1900 = 100)

Source: Magee (2000), p. 245.

of the rate of technological change to be gleaned (Inkster 1990; Magee 1996; Greasley & Oxley 1998; Banerjee 2012). Using patent data, for example, an outline of Australian technological effort (an approximation of what might now be called R&D) across the 19th century can be traced (Magee 2000). Such an outline is presented in Figure 6.1. It confirms the view that the 1880s were unique in the history of Australian technology (Serle 1971, pp. 82–3; Davison 1978, p. 133). In this decade of economic boom and diversification, technological effort rapidly deepened and widened (at a per capita annual rate of 8.4 per cent); local technological creativity had come of age. Prior to 1880, however, progress had been slower, with no significant upward trend in effort evident – a reflection seemingly of the colonies' still relatively less diversified economies. Indeed, expressed in per capita terms, Australian technological effort, depicted in Figure 6.2, may have actually undergone a retreat between 1860 and 1880, declining at a rate of about 1 per cent each year. With the cessation of the boom and the arrival of the depression at the end of the 1880s, the scale and intensity of technological effort within Australia sharply declined, then returned to a slower per capita growth rate of about 0.5 per cent, albeit with significant fluctuations. This correspondence between the economic boom and technological surge of the 1880s and the subsequent slowdown with the onset of economic depression highlights the strong connection between economic and technological activity.

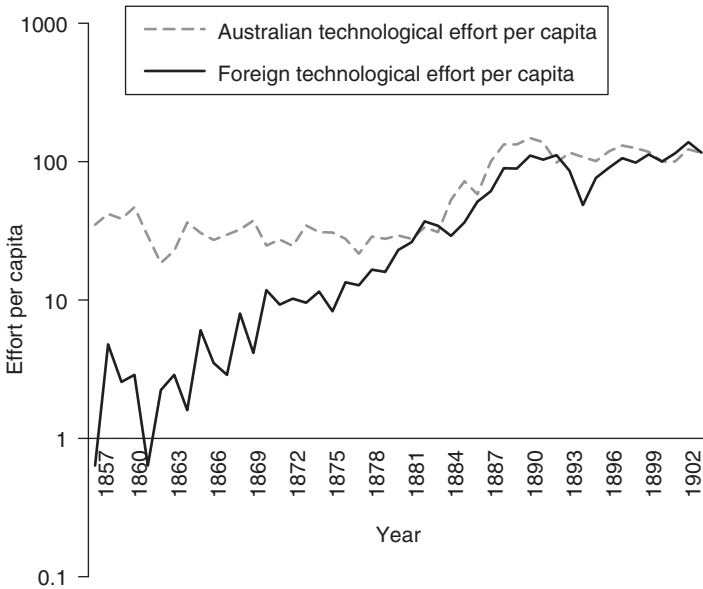


Figure 6.2 Per capita Australian and foreign technological effort, 1857–1903 (1900 = 100)

Note: The series are plotted using a logarithmic scale that depicts rates of growth rather than levels. A constant rate of growth appears as a straight line and increasing (decreasing) growth rates as a rising (falling) slope.

Source: Magee (2000), p. 245.

Figure 6.2 also maps the per capita supply of foreign technological ideas (or effort) as witnessed in pre-Federation's Australia's largest, most important and, because of its relatively low costs and modern and effective institutions, internationally regarded patent system – that of the colony of Victoria (Hack 1984, pp. 11–15). Around 30 per cent of all patents between 1857 and 1903 were filed by residents of other nations, a share that steadily grew over the latter half of the century. The United Kingdom and the United States dominated, together accounting for more than 70 per cent of all non-Australian patents.

There were two distinct periods of foreign patenting in colonial Australia. Up to 1890, foreign patent applications per head of the Australian population grew on average at 5.4 per cent per annum, and then slowed to 1.3 per cent for the remaining years (1891–1904) of the colonial patent system. Given that these rates, in all periods apart from the 1880s, were significantly above those achieved by local patentees, it implies that new foreign technologies assumed an ever larger share of the stock of Australian technological knowledge as the 19th century unfolded. The trend is readily apparent in patent data. In

1860, 4.2 per cent of all patents were of foreign origin; by 1882, the corresponding figure was 42.9 per cent. Thereafter, the share of foreign patenting fluctuated between 30 and 40 per cent (Magee 2000, pp. 50–5).

Technological effort occurred in all sectors of the economy. The spread, however, was uneven. Evidence from patenting in Victoria, presented in Table 6.1, shows that the most prolific levels of activity were found in metalworking, agricultural machinery, and the extraction of metals from ores by chemical and mechanical means. Together they accounted for over a quarter of all patenting. Other industries where there was considerable effort were general engineering, services and distribution, construction, household consumer goods, and food processing.

The strengths of foreign patenting in Victoria lay very much in the manufacturing and tertiary sectors. These strengths were very broad indeed, spanning all major branches of industry and finding strongest expression in the more scientifically and technologically advanced areas of the 19th-century world, such as the generation of heat, light and power; the production of chemicals and explosives; all forms of engineering; the running of railways and communication networks; and the manufacture of textiles, clothing and footwear. By contrast, Australian inventors in the 19th century tended to display technological prowess in areas most familiar to Australian society and that, in general, did not require the same degree of formal scientific or technological know-how: agricultural and dairying machinery, construction and general mining equipment, carriage and coach making, and household products.

Table 6.1 demonstrates that the Australian technological experience was not narrowly tied to export-orientated activities; rather it was broad in a manner consistent with the growing, diversifying economy that underlay it. Indeed, the entire mining and primary sectors accounted for only 23 per cent of patenting activity; manufacturing for over half. Just three areas of the manufacturing sector — metalworking, engineering and food processing — produced as many patents as the primary and mining sectors together. Even the tertiary and household sectors attracted as much attention from inventors as mining and primary production. Although these shares were indubitably influenced by the differing propensity to patent of each industry, the fundamental point of Table 6.1 — that the supply of technological ideas in Australia embraced all sectors and industries — remains.

The movement of sector shares across the period amplifies the point. Between 1857 and 1903, the share of the mining and primary sectors fell by more than half from 38 per cent in 1857 to 15.6 per cent in 1903, while the share

Table 6.1 Industry and sector shares of Australian and foreign patenting in Victoria, 1854–1903 (%)

Industry	Share of all patents	Share of Australian patents	Share of foreign patents
Agriculture	8.6	10.6	3.8
Books, paper, printing	2.1	1.7	2.9
Bricks, pottery, glass	1.6	1.6	1.6
Furniture, bedding	1.2	1.3	0.9
Woodworking	1.1	1.2	1.0
Chemicals, dyes, oils	3.1	2.4	4.6
Medicines and remedies	0.3	0.4	0.1
Explosives	0.7	0.5	1.3
Construction	6.2	6.9	4.4
Dairy, fishing, and forest products	0.7	0.9	0.4
Alcoholic beverages	0.7	0.6	0.9
Food processing	4.6	4.4	5.0
Food preservation	1.0	0.9	1.1
Refrigeration and ice making	1.2	1.1	1.5
Tobacco products	0.6	0.4	0.9
Heat, light, power	2.4	1.2	5.1
Household consumer	5.0	6.0	2.7
Household producer	3.1	3.7	1.9
Leather	1.8	1.8	1.7
Extraction of metal from ores	8.3	8.5	8.0
Carriage and coach making	3.5	3.8	2.6
Engineering	6.6	6.0	7.9
Industrial metals	1.0	0.8	1.3
Metalworking	10.5	10.0	11.9
General mining	2.8	3.5	1.3
Treatment of non-metal mine products	1.1	1.1	1.0
Other manufacturing	1.6	1.2	2.4
Pastoral	2.5	2.7	2.2
Railway	4.2	3.6	5.6
Shipping	1.3	1.3	1.2
Communication	1.0	0.6	1.7
Services and distribution	6.2	6.2	6.3
Textiles, clothing and footwear	3.6	3.1	4.9
PRIMARY	11.9	14.2	6.4
MANUFACTURING	56.2	52.4	65.0
TERTIARY	12.7	11.7	14.8
HOUSEHOLD	8.1	9.6	4.6
MINING	11.1	12.0	9.3

Source: Magee (2000), p. 56.

of manufacturing and tertiary rose from 51.9 per cent to 74.2 per cent (Magee 2000, pp. 57–9). Patent applications for technologies intended to be used in the household (often called ‘household’ patents) also grew in relative importance throughout the latter half of the century, with most force in the 1880s. Improvements in everyday producer and consumer goods ‘essential’ to the burgeoning middle-class culture of increasingly affluent 19th-century Australia, such as washing and cooking implements, tea paraphernalia, parlour games, ornaments, bread boxes, theatrical devices and the corrugated-iron water tanks common to Australian homes (first patented in 1857 by John Carter), lay at the heart of the proliferation of household-related patents.

Even allowing for the impact of different propensities to patent, this changing industrial distribution of patenting clearly indicates that the technological base of Australia was dramatically broadening into areas that were not directly linked to the production and sale of export staples. The traditional emphasis of the economic history literature on the technological development of the mining, pastoral and agricultural sectors needs to be extended to embrace more fully the substantial contributions of the manufacturing, tertiary and household sectors to Australia’s technological experience.

Technological change in Australia was largely an urban phenomenon (Inkster 1990; Frost & Dingle 1995a). Melbourne, Sydney, Brisbane, Adelaide and Perth were the vibrant hearts of Australia’s technological system. Over 60 per cent of Victoria’s patent applications between 1857 and 1903 were filed by individuals living within a five-mile radius of the centre of Melbourne. In this regard, Melbourne was not unique. The technological dominance of the capital city was replicated in each colony. Outside the capitals, the larger regional towns in each colony – Geelong, Ballarat, Bendigo, Broken Hill, Newcastle, Albury, Bathurst, Mount Gambier, Gawler, Port Pirie, Rockhampton Charters Towers, Townsville, Mackay – all figured prominently. Elsewhere, technological activity was less prevalent and tended to be limited to industries dominant in the local economy where, of course, it often had significant impact (Magee 2000, pp. 38–48). For example, throughout the 19th century, innovative farmers in many regions across the country actively developed and adopted drought- and disease-resistant varieties of seeds that better suited the environment in which they worked. While these innovations were not often patented or even patentable, they did represent important rural sources of agricultural improvement.

While the pre-eminence of the capital city remained throughout the 19th century, technological effort steadily deepened in other regions as the century progressed. The simplest explanation for this geographical spread

of technological creativity lies in population growth. More people in a particular location meant more new ideas (Simon & Sullivan 1989). Given that people congregate in greatest numbers in cities, creativity is at its most acute in urban environments. The evidence, however, does not support this connection. Statistical analysis of colonial patent data reveals that after the 1870s population size was a poor indicator of not only a region's level of technological activity, but also its relative ranking as a source of new ideas. The maturity and diversity of the regional economy were much better predictors of local inventiveness (Magee 2000, pp. 46–7). The ability to perceive new technological opportunities is greatly enhanced by learning acquired through the acts of production itself (David 1975). Economic diversification, by broadening local technological needs and experiences, encourages deeper engagement in the national technological system and unleashes the potential for technological change. Population size per se did not guarantee a greater scale or intensity of technological effort, simply because population growth in a region did not necessarily signify increasing economic diversification. The opening and clearing of new land could induce people to a district without expanding the range of its economic activities and, hence, technological opportunities. Larger towns and cities thrived technologically because they were consistently and overwhelmingly the most economically diversified parts of the country.

Unlike modern technological activity, which is dominated by firms and corporations, 19th-century technological change was almost exclusively the preserve of individuals (Encel & Inglis 1966). Indicative of this is the fact that only 2.9 per cent of all applications in pre-Federation Australia's largest patent system were lodged by companies, and most of these appeared in the final decade of the colonial system. The vast majority of these companies were foreign-based, with primary interests in agricultural machinery, engineering, metalworking and communications (Magee 1998, p. 233).

Technical skill and inventiveness in the 19th century were also largely regarded as male traits: just 1.1 per cent of all patents between 1854 and 1903 were lodged by women (Magee 1998, p. 233). This low percentage, of course, does not provide an accurate reflection of the gender distribution of technological effort in the second half of the 19th century. Until the enactment of legislation that recognised the rights of married women to maintain separate estates, hold personal property (including intellectual property) and sue and enter into contracts with regard to their estate, the opportunities available to the female inventor to acquire property rights over their ideas were extremely limited (Khan 1996). Instead, the conventional practice,

even after the passing of married women's property laws, was for the legal ownership of these inventions to be transferred to a male member of the family, who would subsequently lodge the patent application in his name. The overwhelming maleness of patenting in the 19th century is, therefore, something of an exaggeration that underplays the contribution of women in Australia's technological history. The case of Elizabeth Barnston Parnell is illustrative. Following the death of her grazier husband in 1880, Parnell, who had properties in the Hunter River district and Richmond, New South Wales, embarked upon a remarkable inventive and business career in metallurgy. Two years later, she patented the 'E. B. Parnell process for the extraction of precious metals from ores' and formed a company, the New South Wales Pyrites Patent Co. Limited, to work her process. With seemingly little formal training in mining, geology, chemistry or industrial processes, she took out 48 patents in Australia and Britain (where she eventually relocated) between 1882 and 1913, variously stating her profession in official documentation as a 'metallurgist', 'gentlewoman' or, most revealingly and unusually for the time, 'inventor' (Moye 2000; Jaffe 2010, p. 154).

Similarly, the formal contribution of indigenous peoples to the development of European technology in Australia was not great. Aboriginal knowledge of the environment, however, deeply influenced colonial Australia's technological history in a multitude of informal, often indirect ways. An exception to this pattern of limited, informal Aboriginal interaction with the European technological system was David Unaipon. Born in 1872 at Raukkan Mission near Tailem Bend, east of Adelaide, Unaipon was a diverse and creative thinker who throughout his life experimented in a range of areas, including mechanical and ballistic propulsion and polarised light. Despite leaving school at the age of 13 and being largely self-taught in science and mechanics, he lodged at least 10 patents and was responsible for, among other things, an improved shearing handpiece and a centrifugal machine. At times dubbed 'Australia's Leonardo', his face now adorns the Australian \$50 note (Richardson 2004, p. 64).

Individuals of all occupations contributed to building Australia's technological capabilities. The most prolific contributors, though, were engineers, who were responsible for nearly every fourth patent between 1854 and 1903 (Magee 1998, p. 234). It is important to note here that in the 19th century the term 'engineer' did not imply someone with the same depth of scientific expertise as it does today. Most colonial engineers had no formal qualifications and received their training entirely through apprenticeships and direct shop-floor experience. Nevertheless, their intimate practical understanding of, and familiarity

with, machinery still rendered them the most technologically sophisticated class of workers in 19th-century Australia. The adaptability of their knowledge and often extensive networks across industries inevitably placed them at the core of Australia's maturing technological system (Rosenberg 1970; Churchward & Milner 1988; Thomson 1991; Moyal 1993).

With the passage of time, however, many other occupations, whose participation in Australia's technological system had previously been limited and fairly informal – farmers, graziers, public servants, teachers and shopkeepers – were increasingly drawn into the colonies' technological activity, a product of a growing and diversifying economy that offered to an ever expanding range of people the opportunity to profit from technological ingenuity. This shift was most pronounced during the 1880s and illustrates that the vibrant technological creativity of that decade involved not just a greater intensity of activity, but also the incorporation of a wider range of society into the nation's technological efforts. Technology and its promotion no longer remained solely the preserve of the engineer, machinist or highly skilled artisan. There was in Australia, as in the United States, something of a 'democratization of invention' in the 19th century (Sokoloff & Khan 1990; Magee 1998; Khan 2005).

In terms of skills and expertise, this process of democratisation introduced to the nation's technological system a group of people who were less technically minded, less orientated to the professions and less formally trained. The phenomenon shows two things: that the virtues of technological change were widely accepted in the colonies, and that the knowledge and skills base on which technological advancement in 19th-century Australia had been erected was not so recondite as to exclude the vast majority of the adult population. Rather, the practical, everyday skills possessed by a large proportion of the workforce appear to have been perfectly adequate for engagement in inventive activity. In most fields of technological investigation, intuition, familiarity with the technology, and a knack for problem-solving remained the only true prerequisites for inventiveness.

Australia had its 'great' inventors too. Among their ranks, one can include such prominent 19th-century figures as Frederick York Wolseley (sheep-shearing machinery), Mephan Ferguson (iron piping), James Cosmo Newbery (chemical applications to mining and industry), Hugh Victor McKay (stripper harvesters), Thomas Sutcliffe Mort (refrigeration), Eugene Dominique Nicolle (refrigeration), Robert Savage (agricultural techniques), Hugh Lennon (agricultural machinery), James Harrison (ice-making machinery) and John Furphy (agricultural machinery and water carts). While most had

arrived in Australia from the British Isles in their twenties already equipped with stronger technical backgrounds than local-born inventors, their formal education rarely extended beyond basic schooling or apprenticeship. The inventor and agricultural writer Robert Savage had been educated at Trinity College, Dublin and James Cosmo Newbery had studied at Harvard University and the Royal School of Mines in London, but they were very much exceptions. Although engaged in some of the most technologically sophisticated challenges of their time, such as the application of chemical processes to mining, advanced engineering, power generation, telephony and refrigeration, the typical prolific inventor, like the average Australian inventor, did so with a human capital endowment that was neither unique nor dependent upon significant prior investment in formal skills acquisition (Moyal 1987; Magee 2000).

Sources of technological creativity

In the previous section, some of the main patterns of technological change in colonial Australia were detailed. But what were the sources of that technological activity? This is a hard question to tackle, not least because its answer potentially involves an array of interacting, yet distinct, social, economic and political forces (Mokyr 2010).

A good starting point is to look at the composition of the Australian population. Early Australia was an immigrant nation par excellence. In 1828 more than three-quarters of the population of New South Wales were migrants; by 1861 nearly two-thirds of Australians remained foreign-born (Price 1987, pp. 10–11). Most immigrants, whether coerced or not, had come to the colonies with a solid understanding of at least some aspects of how Britain's market economy had operated (Butlin 1994, p. 107). They also brought with them the ethnic, religious, artisanal and commercial networks that had been forged at home and now enabled them from Australia to retain access to not only the valuable wells of social capital that existed within the English-speaking world, but also the epistemic base and Baconian tradition – that scientific reason ought to be applied to the pursuit of useful knowledge – of Britain. The key to understanding their success finds its deep roots here. European Australia was founded on the same value system that had given birth to the British Industrial Revolution and the modern era (Mokyr 2009). The convicts and settlers of the First Fleet and beyond had nothing to learn about the power, transformative nature or societal importance of technological creativity (Raby 1996, p. 18). It was part of their cultural DNA.

The occupational mix of these earlier settlers represented a cross-section of the industrial skills and trades of contemporary Britain – at the time, the most technologically advanced nation on earth (Nicholas 1988a). Compared to those who migrated to the eastern seaboard of the United States in the 19th century, Australia's immigrants were relatively skilled, with, for example, a disproportionate share of adult males departing from Britain between 1876 and 1890 being described as skilled workers, merchants and professionals (Frost 1991). As such, it is not surprising to discover that, faced by an alien and threatening environment, they soon showed themselves to be an adaptive and innovative people. There was no need for Australians to create a technological spirit or mindset anew. Australia began life with the set of skills, knowledge and market-orientated institutions needed to succeed.

While this British inheritance provided an enabling backdrop, the deep determinants of the colonies' technological creativity, it cannot alone account for the patterns of Australian technological effort across the pre-Federation era. To comprehend how the Baconian spirit and British institutions intrinsic to Australian society ultimately led to technological change in specific sectors at particular times requires further, more contextual information. The literature is not terribly helpful here. Australian economic historians have tended not to devote too much attention to the sources of technological change. At best, most offer, often only in passing, conventional economic explanations. Sinclair (1976, p. 154), for example, linked both the development and adoption of refrigerated shipping in Australia to its enhanced profitability in the aftermath of the depression of the 1890s, while Butlin (1971, p. 37) saw the 'stimulating effect of rising world grain prices' as encouraging Australians 'to take advantage of the technological change in wheat-breeding achieved in the nineties'. Snooks (1973, p. 32) attributed the inventive success of W. R. Hume and Hume Enterprises to their acute responsiveness to economic pressures and incentives, especially declining profitability and market potential, while Farrer (1988, p. 13) described Australia's pioneering work in the field of canning and refrigeration technology in the 19th century as the 'by-products of the British market pull for meat and the technological response to it'. The primacy of demand also appears to find some support from students of the 19th-century Australian agricultural implement industry. According to Parsons (1970, p. 323), most innovation in agricultural technology at this time was 'developed in a time sequence determined by the relative profitability of developing the appropriate machines for each region', while McLean (2013, p. 109) noted that in addition to being a 'response to labour-scarcity and its relatively high price', agricultural mechanisation also 'raised yields by better

spacing seeds during planting', speeding up operations and assisting in weed control.

Others, however, have preferred to place greater emphasis on factors beyond the immediate influence of market forces. Moyal (1987) argued that the 'collective technical manpower' Australia managed to acquire over the course of the 19th century played a crucial role in its technological successes. In a similar tone, Edelstein (1988) placed the development of professional engineering in Australia at the heart of its industrialisation and rapid technological change going into the 20th century and beyond.

To Todd (1995) and Inkster (1991), the development of science and scientific institutions, rather than any particular skill, was key to the emergent technological maturity of Australia in the Victorian and Edwardian eras. By that time, Australia had developed a home-grown technological system that not only stimulated local inventiveness, but also broke the nation's dependence on foreign technology, allowing, as a consequence, Australian entrepreneurs and manufacturers for the first time to choose freely from the global technology shelf. Core to this burgeoning technological capability was the growth of scientific institutions, especially informal ones, such as libraries, museums and observatories. More so than formal institutions, like universities or learned societies, which were small, isolated and scientifically dependent on Europe, these informal institutions acted to popularise scientific methods, narrow the gap between industry and formal science, and enhance the capacity of Australians to analyse production problems and locate, either locally or overseas, appropriate solutions. They were, according to Todd (1995, p. 230), a vital 'intellectual and cultural bridge' between the technological systems of the metropolis and the periphery.

Magee (1996; 2000, pp. 102–25) has employed time series analyses of the determinants of patenting behaviour in colonial Victoria to assess the relative significance of some of these explanations. He found that the strongest factor influencing the emergence of inventive ideas was the expansion and diversification of the market, though other demand-side influences, such as the movement of the relative prices of capital and labour, also came into play, especially for local inventors. Thus, in colonial Australia, environments rich with openings, opportunities and material rewards for the creative mind were those most conducive to technological change. Some minimum foundation of technical skill and know-how was also needed for the lure of the market to be efficacious. The advent of a locally trained engineering profession and the expansion of the manufacturing sector both had their roles, if ones that were perhaps not as prominent as typically believed.

What was the contribution of Australia's technical and scientific institutions and the human capital they produced? One thing that can be said with certainty is that public science, 'science policy' and the popularisation of scientific methodology did not occur in Australia in any meaningful sense before 1888 (Inkster 1985, pp. 689–90). As such, the rise of scientific institutions can at most explain only the last decade of the colonial experience. In the second half of the century, public debate and interest in technical education gave rise to a proliferation of mechanics institutes, working men's colleges and schools of arts or mines across the country (Myers 1999; Baragwanath 2000). According to Murray-Smith and Dare (1987, pp. 5–10), however, such institutions, like the Working Men's College that eventually became the Royal Melbourne Institute of Technology, were not in any real sense technical institutes designed to impart advanced, practical knowledge. Rather, they were establishments whose primary purpose was to encourage the social betterment of the working man through the use of his intellect. Most of those who attended these colleges, schools and institutes did so purely to acquire the most basic academic and communicative skills, rather than a certified trade qualification. To the disappointment of the advocates of technical education, only a minute percentage of students did enough coursework to gain a technical qualification (Cusack 1973, p. 14; Murray-Smith & Dare 1987, pp. 31–57). Rather than being a failure, this outcome simply reflected the fact that the real demand in the community was for a broadening of the general education of the workforce rather than for intensive technical or scientific instruction. While it is true that the new technologies of the latter half of the 19th century were being built increasingly on a foundation of advanced technical and scientific knowledge, it was also still the case that virtually all production processes remained firmly grounded in practical skills long familiar to tradesmen and artisans. The only industries where direct scientific input was becoming markedly more intensive were brewing and sugar refining (Todd 1995). It was there that the recruitment, at the time still modest, of scientifically trained workers was first actively pursued.

Similarly, the emergence of scientific institutions in 19th-century Australia cannot be separated from the needs of the economy (Inkster 1985, p. 698; Inkster & Todd 1988, p. 106). The establishment of the government-sponsored agricultural research institutions, which were to undertake valuable experiments on the mitigation of crop diseases and poor quality soil, awaited public realisation of the threat that declining agricultural yields posed for economic wellbeing. These institutions first emerged in South Australia and Victoria in the 1870s and 1880s, as it was there that the extensive margin to grain growing

and the problems accompanying continuous cropping were first to occur. In New South Wales and Queensland, where there was still significant arable land available in the interior, the need for agricultural research institutions was postponed for another two decades (McLean 1982, pp. 305–7).

Australia in the global technology market

Australian economic history did not take place in a vacuum. Spatially distant from but culturally close to the great population centres of Europe, colonists were neither immune to, nor ignorant of, the world around them. Australia did not have to develop in isolation. In terms of technological development, this was to have important implications, for, from its beginning, European Australia was able to draw freely upon the rich accumulated knowledge of the Anglophone world that was its heritage. As the 19th century progressed, the technological marketplace at the new society's disposal became ever more global, sucking in and integrating good ideas from an increasingly wide array of the world's cultures. This global market for technological ideas was an abundant resource ready-made for the settlers to exploit. Few then – perhaps fewer since – have appreciated the good fortune that had been bestowed. Had Australia been colonised just a hundred years earlier, this market would not have existed and many of the remarkable transformations wrought by technology in the settlement's first century would not have come to pass.

The extent to which Australians tapped into this global market for technological ideas at any point of time depended on a number of factors: the tolerance of society to dependence on foreigners, the existence of effective mechanisms to access the market, and the level of colonial economic development. Earlier in the chapter it was argued that the affluent, diversified economy that emerged in Australia over the 19th century provided a fillip to the geographical, industrial and occupational spread of technological effort. On top of these contributions, economic diversification also encouraged Australian firms and entrepreneurs to become ever more deeply integrated into the international market for technological ideas. Put simply, the breadth of that integration was a function of the degree of economic diversity. The logic underlying the connection runs as follows. An overwhelmingly agricultural society's utilisation of the international market for technological ideas tends to be limited to agriculture-related inventions. As significant secondary and tertiary sectors emerge, that use accordingly broadens and is matched by a growing desire of foreigners to supply the requisite technologies. Lured by the now realistic promise of profits, the attractiveness of seeking markets

for all types of technologies, including those employed outside primary production, in this former agricultural society becomes steadily more apparent to foreign inventors and entrepreneurs.

Such a scenario resonates with the Australian experience. As economic activity broadened over the course of the 19th century, most markedly from 1850, the technological needs of the colonist expanded in parallel. Nineteenth-century Australia, however, did not possess the expertise to produce efficient, viable technology in all areas of production, so to fill gaps in its capabilities, resort was increasingly made to the international technology shelf. This preparedness to import technology was not a sign of weakness or lack of sovereignty. Decisions were made locally with an eye to putting limited resources to their most efficient use: why waste capital on developing an uncompetitive domestic technology, when world best practice was available at a fraction of the cost? Reliance on extra-colonial sources in certain areas of technology made good business sense (Magee 2000, pp. 148–80).

Nor had Australia's technological capability dwindled as a consequence of its growing import of foreign technologies. Integration into the international market for ideas did, however, carry implications for the technological strategies employed by colonists. Among other things, it made them consider more carefully which pursuits would yield the greatest return for their technological efforts. Over the latter half of the 19th century, there was accordingly a tightening specialisation of Australian technological activity in areas that complemented the natural resource endowment and where there was local expertise, such as agricultural and dairying machinery, construction and general mining equipment and techniques, carriage and coach making, household products, and the manufacture of food and non-alcoholic beverages (Magee 1999). These were areas that generally required more practical experience than formal technological knowledge to succeed and where Australians were, or thought themselves to be, competitive enough to justify the costs of seeking patent protection in overseas markets like the United States (Cantwell 1991, pp. 45–7). Australian-made agricultural machinery, such as McKay's stripper harvester, proved great successes locally and overseas and contributed, along with wire fencing, drought-resistant varieties of wheat and a host of other devices, to making Australia 'the world's agricultural productivity leader of the time' (Irwin 2007, p. 288; McLean 2013, pp. 109–12). In metaliferous mining too, Australians made great contributions to world technology. Hancock's jig treatment of low-grade copper ores, Ullrich's magnetic separator for the efficient recovery of lead and zinc from sulphide ore concentrates, and the flotation of minerals process developed at Broken

Hill were just some examples of locally developed mining technologies that found recognition and wide usage beyond Australian shores (Millar 1993; Mouat 1996; Menghetti 2005). The flipside of the coin was a deepening reliance on foreign sources for much of Australia's 'hi-tech' equipment. Through greater technological integration into the world market, Australians effectively substituted access to advanced foreign technological practice for the development of local expertise.

Of course, Australia's technological integration with the rest of the world did not begin with the economic diversification of the second half of the 19th century. As Raby's (1996) study of technological change in the first 50 years of European settlement in south-eastern Australia catalogues, the Australian colonies from their inception were particularly adept at scanning the technology shelf for useful inventions. The absolute need of the nascent colonies to establish a solid agricultural base dictated that whatever relevant technological resources the colonists could get their hands on would be fully harnessed. Informal personal links with 'home' initially sufficed in meeting the early colonists' need for cheap and accurate technological information, yet as time passed and the requirements of the economy grew ever more complex, borrowed institutions, most importantly agricultural societies and publicly funded botanic gardens, came to play more prominent roles in providing colonists access to international technological networks. These networks themselves, increasingly transnational in construction, included among other things professional and commercial bodies, ethnic and regional associations, trade unions and scientific organisations. Some were specific to the British Empire; others were simply stronger within it (Magee & Thompson 2010).

What changed in the second half of the 19th century was not the use of these international networks per se, but the depth to which, and the mechanisms by which, they were exploited. Constant improvements to communication and transportation networks significantly reduced the costs of international intercourse and sharpened the process of technology transfer (Raby 1996, p. 93).

Wilkins (1974, pp. 166–7) identifies a number of private modes of transfer whose importance has increased since the 19th century: FDI, the market for machinery, the transnational exchange of technical knowledge and services, and international patenting. Of these modes, FDI was the only one not to have exerted a major influence prior to Federation, largely because of its relative low volumes. British investors, who were Australia's most important source of capital in the 19th century, preferred to invest indirectly, especially in debentures (Edelstein 2004, pp. 194–5). Only 17.5 per cent of British capital call

in the colonies between 1865 and 1914 found its way into the bricks, mortar and machinery of raw material-producing, shipping, agricultural and trade companies; a further 0.6 per cent, or just £2 million, went into Australian manufacturing (Stone 1999, p. 412).

Foreign capital, however, did exert an influence on leading sectors of the economy through what Wilkins (1988) has described as 'free-standing companies'. These were British-owned, Australian-based companies, which from the 1880s played in some cases key roles in banking, insurance, trading, base metal and gold mining, and stock and station agencies. While the know-how transferred by these companies was frequently tacit and typically not patented, it did help set industry standards and was often quickly adopted by local firms.

The latter half of the 19th century was also a period when capital goods producers were particularly influential and became increasingly interested in marketing their wares internationally. Sales offices and branches were set up in a variety of locations, while advertisements in the local trade press, the distribution of company catalogues and participation at international exhibitions all helped to publicise the new technological products on offer. These business strategies were further backed up after sale in many cases by extensive long-term technical assistance. The eminent Scottish paper-machine manufacturers, James Bertram & Sons Limited of Edinburgh, typified this type of firm. Bertrams circulated among its clientele at home and abroad a wide-ranging catalogue of different machinery and parts, and offered extensive technical advice and assistance, including information on aspects of paper making not strictly related to its own products. Despite protective tariffs overseas, Bertrams did fairly well on the export market. Of the 118 machines the firm made between 1860 and 1913, 41, about 29 per cent, were exported. The biggest market was Scandinavia, although Bertrams' machines also ended up in Australia, with paper machines being sold to Kenny's Mill in Melbourne in 1864, the Australian Paper Company in Sydney in 1865, and A. Miller & Co. of Geelong in 1876 (Magee 1997, pp. 39–42). Driven by intense competition, capital goods producers, such as Bertrams, actively sought new markets wherever possible, in the process aiding the transfer of advanced technology to other countries and regions that lacked the technological know-how (Bruland 1989).

Another mechanism of vital importance to international technology transfer was the patenting and licensing of invention. By the second half of the 19th century, there existed in most countries a long tradition of protecting intellectual property through the issuance of patents. Patenting was

familiar, well understood and valued. The system had acquired so much credibility and commercial utility that there existed what Dutton (1984, p. 108) has called an 'invention industry', characterised by quasi-professional inventors with a high propensity to patent and a vigorous international trade in patented inventions. Indicative of this industry's existence was the fact that the 'great' inventors of the era, such as Thomas Edison, took the patenting of their ideas not just in the United States, but also under non-American patent systems, including Australia's, as normal business practice (Israel & Rosenberg 1991).

The emergence of professional patent agents provided further evidence of the importance that the patent system had come to assume in the market for technological ideas. In addition to drafting and guiding clients' applications through patent offices, agents offered legal advice and acted effectively as 'brokers in the selling, licensing, assigning, and financing of patents' (Dutton 1984, p. 93). By imparting their specialist knowledge on the acquisition and management of intellectual property, patent agents aided in the dissemination of technological knowledge.

In Australia, patent agents quickly became important to the running of local patent systems. The first practising patent agent in Australia appears to have been William Henry Ritchie, who operated out of an office in Little Collins Street West in Melbourne from about 1857. He was soon followed by others, many of whom had prior experience as lawyers, engineers or even as patent agents in Britain. Some of Australia's most prominent firms of patent attorneys were founded in this period: Conigrave and Collison in Adelaide in 1879 and Hepburn and Spruson in Sydney in 1887. By the 1880s the status of, and vital function performed by, patent agents found recognition in the array of regulations and licensing procedures introduced in most colonies, which ensured that all who entered the profession were appropriately qualified. In 1890 the Australasian Institute of Patent Agents was established (Hack 1984, pp. 26–36, 74; Richardson 2004, pp. 30–1).

Prior to the Paris Convention of 1880, at which uniformity and agreement in the treatment of patentees across national systems was officially sanctioned by 11 (later 29) countries, there was strictly speaking no formal nexuses between patent systems other than those that had arisen almost unwittingly from a handful of bipartite treaties (Penrose 1951, pp. 44–58). Nevertheless, by the mid 19th century there did appear to have been a *de facto* linking of the main patent systems, an interrelationship that had its roots in the desire of the proprietors of technologies to maximise returns by protecting and selling their ideas in every market where they might find profitable use.

Reflecting this willingness of clientele to patent outside their own jurisdiction, as well as their own requirement to test the priority of the applications before them, patent officers and agents in every system communicated and shared information. From the early 1860s, Britain exchanged technical and legal publications with each of its Australian colonies. Consequently, the patent offices of Britain and Australia kept impressive libraries that contained reports, legal documents, technical manuals and specifications of patents issued from all corners of the world. Moreover, from 1864 the British *Commissioner of Patents' Journal* published, and sold for 2 pence, booklets that furnished information on how prospective patentees could protect their inventions in each of the Australian colonies (Magee 2000, p. 211).

Patent agents also actively promoted cross-jurisdictional patenting. The Australian patent agent Edward Waters presented a paper on Australasian patents to the Chartered Institute of Patent Agents in London in 1885, an interest in Australia that the organ of the British Institute followed up in subsequent years with articles on patenting law and practice in the Australian colonies (Hack 1984, pp. 74–5). By this stage, Australia was an acknowledged part of the international patenting network. A manual compiled by two fellows of the Chartered Institute of Patent Agents in 1905 listed Australia's patent system as among the 20 or so regimes under which it was worthwhile for British inventors to seek patent protection. In addition to describing how to apply for an Australian patent, the manual informed its readers that 'Australia is a very important field for inventors, there being a good demand for all kinds of labour-saving machinery such as may be employed in mining, railway, and other engineering work, agricultural, sheep farming, tanning, and other industries' (Edwards & Edwards 1905, p. 88).

For their part, Australian patent agents were keen to be integrated into the network. Typical of such keenness were the activities of the patent agent, George Turri. From at least the 1890s, Turri published a quarterly magazine with a run of some 3000 copies, which he used not only to advertise his firm, but also to bring relevant information about patenting in Australia and abroad to the attention of local inventors. *Turri's Inventive Age*, as the publication was entitled, supplied summaries of the costs, details and procedures of patenting in 40 of the world's patent systems. The magazine also alerted inventors to changes in the patent laws of the various countries, described the latest technological developments, suggested profitable avenues for investigation, and advertised local and international competitions and exhibitions. Naturally, the magazine encouraged prospective patentees to allow G. G. Turri & Co. to handle their applications. 'For those seeking the utmost

profits', the firm in 1898 offered to seek protection for their inventions 'in every important country of the world' (quoted in Magee 2000, p. 212).

By the second half of the 19th century then, there existed a series of formal and impersonal mechanisms, of which the international patent system was a part, that facilitated the transfer of technology between nations. While the traditional means of transmitting technologies — migration, personal networks and travel — still remained sources of new ideas, their overwhelming primacy in the process had been broken. In their place, entrepreneurs and manufacturers turned increasingly to the market and its institutions for their technology. For while impersonal, these mechanisms offered greater control and choice and were less risky and costly than relying on either the fortuitous arrival of skilled artisans with new knowledge or techniques or one's own connections and inventiveness.

Conclusion

Australia's technological history is tightly interwoven with its economic history. Technology was no mere passive force operating independently from the main current of life in the colonies. Rather, the patterns and structures of local technological effort and international technology transfer reflected the dynamics of the underlying development of their economies. Integral here were the growth and diversification of those economies across the century as well as their endowment of basic technical know-how. Combined with conducive institutions and mindsets inherited from Britain, these yielded a society that was capable of displaying sustained creativity across a range of technological fields.

Yet Australia was no technological giant in the mould of the United States, Britain, France or Germany. Rather, Australia was a collection of small colonies with modest technological ambitions. In this regard they were hardly unusual. As one eminent historian of American technology has reminded us, in its colonial era even 'American inventiveness was not notable' (Hindle 1989, p. 11). When compared with the other main British settler societies, Australia's technological experience in the 19th century was neither peculiar nor obviously deficient. In fact, in many ways, the Australian colonies appear to have performed relatively well, at least with respect to South Africa and New Zealand. In 1910, much of South African agriculture remained inefficiently organised and barely mechanised (Jones & Müller 1992, pp. 12–13), while the achievements of Australian agricultural technology had already been acknowledged internationally. Some of this disparity, of course, was

due to the poorer agricultural lands of southern Africa, yet there was also an element of technological divergence. This was reflected in the composition of non-American patenting in the United States between 1890 and 1892. Of the 6084 patents granted to foreigners in this period, 16 per cent went to Canadians, who, of course, had the advantage of proximity, 2.4 per cent to Australians, and less than one-tenth of a per cent to both New Zealanders and South Africans (Cantwell 1991). Australia's contribution to the international market for technological ideas in the early 1890s was, unlike that of other neo-European societies of the time (with the exception of Canada), palpable and diversified enough to include non-resource-related fields. Although these findings betoken no glorious efflorescence of technological ingenuity in 19th-century Australia, they do suggest that, when placed in a proper comparative perspective, Australia's technological performance was perfectly respectable.

One of the most important arguments of this chapter is that the determinants of technological ideas in Australia had their origins well and truly in Australia. Much of Australia's technology may have had foreign roots, but its introduction and development, along with that of pure Australian invention, was decidedly an economic activity shaped by the contours of Australian experience. Foreign technologies were not simply imposed on Australia from abroad because of an enervating 'national obeisance to Britain's imperialist intentions' (Hill 1988, p. 173; Cochrane 1980, pp. 1–10). Such an approach underestimates both the benefits of sensibly borrowing foreign technology and the sovereignty of Australian decision making. By importing the best foreign technology, Australia found the most cost-effective means of enhancing the competitiveness of not only its export, but also its import-competing, sectors, which, in turn, improved its trade balance with the rest of the world. The transfer of technology also benefited Australia's own technological capabilities by allowing Australians to focus their creative energies on pursuits for which they had distinct advantages in terms of expertise and skill.

This strategy appears to have served Australia well in the colonial era. But, even before the end of the 19th century, new trends were emerging that were destined to reshape the nature of technological change in the 20th century. Many of these changes had their origins in the increasing application of science to industrial processes and the growth of large-scale, vertically integrated businesses. At first, these new phenomena found focus in the chemical, pharmaceutical, electrical power, and automobile industries, but eventually spread their way across the economy (Mowery & Rosenberg 1989, 1998). Science assumed an ever more important and explicit role in

production and forced a rethink of the manner in which technological change was approached. The less systematic, individualistic and experience-driven effort of the 19th century was supplanted by conscious, integrated strategy. Distinct in-house R&D functions in companies and specialist research laboratories staffed by scientifically trained personnel appeared, charged with the task of managing continuous technological progress. Science and technology policy attempted to provide overarching guidance and support – a national innovation system – in the hope of channelling this R&D effort more effectively toward national goals (Aghion & Howitt 2009). The day of the individual inventor using practical know-how had passed; technological change became the preserve of the corporation. How effectively the colonial experience had prepared Australia for this new era is a subject taken up in later chapters.¹

1 To the extent that there is a 'conventional wisdom', it is that Australia's technological performance in the 20th century lagged, particularly in the industrial sphere. While it is not clear why this was the case, there appear both public and private explanations. As the century progressed, science increasingly became the responsibility of government rather than the private sector, while local firms overwhelmingly chose to pay licence fees for foreign technology or, in the case of subsidiaries of foreign firms, simply adopted practices from their parents. As a consequence, the level of domestic R&D expenditure and investment in the building of a national innovation system may not have been sufficient to engender a local technological dynamism (Schedvin 1987a; Mellor 1958; Stubbs 1968).

Industrialising Australia's natural capital

DAVID GREASLEY

Introduction

Extracting and utilising natural resources was central to Australia's economic development in the period 1788–1901 and beyond. Exploitation of the land and sea for cultivation, grazing, marine life, and minerals are themes writ large in Australia's economic history. Cultivation, of fruit, vegetables and most especially of wheat in New South Wales and Van Diemen's Land (present-day Tasmania) helped to sustain the new Australian penal colony to 1820. In the longer term, overseas markets became the chief destinations for Australia's farm and mine production. Wool and gold led after 1820, but myriad resource industries, including timber, whale oil, grains and copper, contributed to development. Following Victoria's gold rush of the 1850s, the resource sector became more diversified. The pastoral frontier was associated with cattle and sheep, while coal, iron ore, silver, tungsten and zinc added to minerals production, and dairying, sugar, wheat, dried fruit and wine became export industries before Federation in 1901.

Collectively, the rural industries and mining, or the primary sector, contributed around 31 per cent of Australia's GDP and nearly all exports in 1901 (Vamplew 1987, pp. 133, 194). Primary-sector growth was accompanied by Australia attaining internationally high GDP per capita, and the possible connections between the two are much debated. A high ratio of utilised natural resources per capita provides the most obvious linkage to high average incomes, but the debates are complex. The exploitation of Australia's natural capital by the European settlers and their descendants was shaped by their knowledge, institutions and enterprise. Australia was drawn into international commodity and capital markets by European settlement and the overseas market underpinned the expansion of the resource industries.

Enterprise and finance moved into the resource industries to exploit Australia's natural capital with varied consequences. The extensive use of

land for sheep or cattle was associated with high value-added production per worker. With wool, a modest stimulus was given to other sectors, including financial services, whereas for wheat and cattle a variety of manufacturing linkages developed, although their force needs careful scrutiny. The land was a heterogeneous resource and, for the new settlers, a challenging environment. The landscape, climate and geology were unfamiliar to the Europeans, and an ability to adapt their knowledge to a new, sometimes unkind, world to extract value from Australia's natural capital was vital for economic development.

Equally, sustainable development rests on a good husbandry of the rents extracted from natural resources. The common feature of the resource industries is their extraction of natural resource rents. In Australia these were substantial and volatile. The capturing and utilisation of resource rents have been central to Australia's long-term development. An important issue is the extent to which extracted natural resource rents were reinvested productively to sustain economic development. Australian institutions, which, for example, shaped public investment and the working of commodity and factor markets, impinged on the resource rents–development nexus. Colonialism and geography shaped Australian institutions. The land occupation accompanying pastoralism was concentrated in relatively few hands, with possible adverse implications for wider economic and political opportunities. Colonial governors, though, tempered the power of the landed elite during the transition to representative governments.

Technology and enterprise are inextricably linked to the value extracted from natural capital. Sparsely populated pastoral landscapes may deter networks conducive to the development and use of new technology (Greasley & Madsen 2010). In Australia the downsides of low rural-population density were countered by farming periodicals and associations, and by knowledge dissipation through cattle and sheep station agents. Other forms of land use, including dairying, wheat and fruit farming, imply denser settlement, with different linkages and implications for enterprise and technology. Mining, in contrast to farming, is an inevitably resource-depleting activity. Some types of mining have strong inter-industry linkages and foster wider enterprise, and coal and iron ore mining, for example, have different developmental consequences than, say, extracting and exporting alluvial gold.

The following discussion combines chronological and thematic approaches to highlight the contributions of the chief resource industries to Australia's economic development. Three key periods are defined, being those associated with the forming of a pastoral economy to 1850, the augmenting of

the resources economy by minerals and new land during 1850–90, and the adjustments and diversification of primary industries during 1890–1914. A concluding section that looks forward to the present-day mining boom is provided. Within these periods the narrative explores the connections of the natural resource industries with enterprise, skills and technology; institutions and social capital; export-led growth; a staples trap and resource curse; and extracted resource rents and sustainability.

1820–50: creating a pastoral export economy

In 1820 Australia's settler economy was confined to a narrow coastal strip of New South Wales and the riverine valleys of Van Diemen's Land. The remoteness of the early convict colonies made exploiting the natural world an immediate priority. Cultivation of vegetables and grains, most especially of wheat, and animal husbandry, was fostered by the (British) public purse to sustain both convicts and the other residents. In New South Wales agricultural land was limited to the Cumberland Plain before 1820 and wheat expansion trailed local demand. Agricultural growth was faster in Van Diemen's Land and important intercolonial trades in grains and potatoes were established. In contrast, pastoralism developed more strongly in New South Wales. The main impetus was colonial government meat contracts. Most often the suppliers were the larger landholders, whose sheep flocks pressed the boundaries of the Cumberland Plain by 1820.

Early Australian growth was not export-led. Rural industries grew within a convict economy buttressed by public spending directed towards procuring food. Exports were around 2 per cent of GDP in 1820. These included wool bound for the United Kingdom, but over the period 1815–20 Australia's exports to India, chiefly of skins and timber, were of around equal value to wool exports (Butlin 1994, p. 179). Between 1820 and 1850 the early convict economy was transformed into a thriving export economy, with internationally high average incomes. Expanding sheep flocks led the transition. In 1850 wool provided around 94 per cent of New South Wales exports, while exports grew to around 25 per cent of GDP (Butlin 1994, pp. 104–92). The increased wool supply was associated with frontier expansion over the Blue Mountains to the native grasslands of central and west New South Wales. This area, including the lands that would become Victoria, supported most of Australia's 15 million sheep in 1850.

Converting native grasses to wool was central to the new settlers exploiting Australia's natural landscape. The colonial population grew quickly,

around 12 times in 30 years to 1850, the sheep flocks more so. Sheep per capita rose from 13 to 26 during 1828–48, reflecting the increased land occupation per capita (Vamplew 1987, p. 107). The land beyond the eastern ranges, with its native grasses, mild winters, adequate rainfall, few predators and sparse Indigenous population, was well suited to grazing sheep. Capital requirements of farm formation were modest. In the 1820s expansion of the flocks was constrained by local demands for meat. Even so, New South Wales sheep numbers rose from around 99 000 to 800 000 during 1820–28, and to 3.1 million by 1838, with the expansion of fine wool merino sheep dominating from the 1830s (Vamplew 1987, p. 107). New South Wales cattle numbers rose from 54 000 to 640 000 during 1820–38. By the 1830s the pastoral sector provided around two-thirds of Australia's exports, and a quarter of its GDP (Vamplew 1987, p. 131). The natural world was a boon, but the land itself was but one ingredient of the successful pastoral economy.

Colonial institutions and public policies, the knowledge and enterprise of the settlers, and the British market for wool all played roles in forming the pastoral economy. Pastoralism was inextricably linked to the expanding farmland frontier, and thus to the political economy of land redistribution in Australia. The institutions of the convict economy and imperial relations shaped land use and ownership rights, as did squatting, the occupation of land without legal title. The outcome was a concentration of land occupation among relatively few pastoralists. Charting pastoral land in use cannot be done precisely, but the estimates of animal numbers and wool exports, whose values grew five times in the 1830s, provide a useful guide. Expansion into New South Wales' hinterland was partly facilitated by land sales and grants. Colonial governors sanctioned land-extensive pastoralism on native grasslands, but they lacked full capacity to manage settlement. Land grants in New South Wales peaked in the 1830s, when around 1.2 million acres were leased, but colonial governors lost control of the land occupation to the squatters (Vamplew 1987, p. 108).

In 1849 around 55 million acres of New South Wales pastoral land was occupied by squatters, with average holdings of around 30 000 acres (Roberts 1935, p. 448). The squatters drove sheep onto unoccupied Crown land without securing property rights. The land-extensive farming produced greasy wool that was competitive in the British market, profits for the rent-extracting squatters, and high labour productivity. Squatting brought land quickly into productive use, but influenced the trajectory of Australia's economic development in complex ways. Concentrated land occupation and a dominant export staple are not always associated with sustained economic

development, as the experiences of Latin America and the southern states of the United States highlight (Engerman & Sokoloff 1997). Possible downsides are limited public education and health investment and institutions that may limit wider enterprise. The much debated resource curse is most likely to have substance where economic and political power is concentrated. How natural resource rents were captured and utilised in Australia needs careful scrutiny.

New South Wales' landscape suited land-extensive pastoralism and the squatters gained the political power to extract resource rents. Additionally, policies – for example, on infrastructure and transport spending, immigration (including of convicts and Asian and Melanesian workers) and tariffs – were in danger of control by squatter-dominated institutions. However, the prospect of a landed elite dominating polity to the detriment of Australia's economic development was short-lived. The land compromise of the 1830s gave the squatters rights to occupation but not ownership. In a perceptive analysis, McLean (2013, pp. 69–73) highlights how countervailing British power limited the squatters' position. The pastoralists gained some security of tenure, but not the ownership of Crown lands. By the 1860s more representative colonial governments facilitated some redistribution of large pastoral leaseholds to smaller farmers. The capturing of natural resource rents was no longer the prerogative of the landed elite, which enhanced the prospects of colonial governments pursuing developmental policies. Indeed, by 1860 the overall supply of fertile land, rather than the squatters' claims, was a bigger obstacle to rural development.

The farmland frontier was finite, but not precisely defined. Pastoralists in Van Diemen's Land encountered an early barrier in the 1830s when land occupation was near complete (Hartwell 1954). The pastoral frontier of Van Diemen's Land spilled to the Port Phillip area in the later 1830s, and the squatters pushed north, to meet the southward flow of pastoralists from New South Wales, to create an arc of sheep farming in south-east Australia. The constraints on further expanding the New South Wales farm frontier were partly the squatters' claims blocking new entrants, but increasingly climatic (Butlin 1994, p. 188). As the pastoral frontier extended to the more arid north and west, investment in paddocks and water supply was needed to extract rents from the less fertile land. A near plateau in the ratio of the sheep to settlers was reached by 1850. Australia's sheep numbers continued to rise, most especially during a second pastoral boom from the 1870s, but in 1890 Australia's sheep per capita was not much above the 1850 ratio (Vamplew

1987, p. 81). The easier rents from nomadic sheep farming were coming to an end by 1850.

Pastoralism was Australia's leading natural resource industry during 1820–50 but agriculture and mining also contributed to early economic development. Around 400 000 acres of land were cultivated in Australia in 1850, roughly half under wheat, and much of the rest devoted to maize and potatoes (Vamplew 1987, pp. 74–6). Agriculture helped feed the rapidly growing population, which reached 400 000 in 1850, thus one acre of land was cultivated per settler in that year. The landscape and climate of Van Diemen's Land was more familiar to the early agriculturalists than coastal New South Wales, and intercolonial trade, especially in wheat, supported the larger mainland colony. Around 20 per cent of New South Wales wheat consumption was from Van Diemen's Land imports by the end of the 1820s (Butlin 1994, pp. 185–6). As pastoralism took stronger hold in the 1830s, intercolonial agricultural trade facilitated pastoral export specialisation. Indeed, the wheat output of Van Diemen's Land in 1838 exceeded that of New South Wales. Gradually, the proportion of food, drink and tobacco products in Australia's imports fell, to around 30 per cent in 1850 (Butlin 1994, p. 166). Australia's natural resources made specialisation in wool exports feasible, in part because of complementary agricultural development.

The bridgeheads of colonial settlement were extended in the 1820s and 1830s, opening future gateways to land occupation. Port Phillip (later Melbourne) provided an alternative route to the grasslands of New South Wales and Victoria. The Swan River Settlement was established in 1829, to eventually give access to farmland in Perth's hinterland and to the minerals of Western Australia. Earlier, in 1824, a northern adjunct of the New South Wales penal colony was established at Moreton Bay on the Brisbane River, adjacent to the pastoral and agricultural land of Queensland. The new colony of South Australia was formed in 1836. The planned settlement of Adelaide was established at the western end of Australia's fertile south-east crescent. By 1850 45 000 acres of South Australia was cultivated, chiefly for wheat. Limited rainfall and the claims of the pastoralists were obstacles to northward expansion, but South Australia became the leading wheat colony (Meinig 1962). South Australia also experienced Australia's first minerals boom. Copper production began in 1844 and reached around 5000 tonnes by 1850, which was chiefly exported (Vamplew 1987, p. 89). Production was lower than in the mines of Cornwall and Devon, but South Australian output increased in importance as British resources depleted.

The Australian economy of 1850 was small by international standards: its GDP was 2 per cent that of the United Kingdom (Maddison 2001, p. 185). The colonies grew quickly; their real GDP rose by a factor of 10 during 1828–50, whereas population grew sevenfold (Hutchinson 2013). Average incomes exceeded those of Western Europe in 1850, and were around 85 per cent of British levels. On any criteria, the shift from penal outpost in 1788 to a prosperous western offshoot by 1850 was deeply impressive. A high ratio of fertile land to population underpinned the prosperity, but various forces shaped the bringing of land into productive use. The origins of the market economy lay in the convict economy and British subsidies, which allowed specialised agriculture and animal farming to develop in New South Wales and Van Diemen's Land. These foundations underpinned the pastoral export economy of 1820–50 and Australia's high average incomes in 1850.

New South Wales exports surged after 1820 and wool dominated from the 1830s. The rising export–GDP ratio during 1820–50 appears consistent with export-led growth. That hypothesis needs to be interpreted with care. British woollens production rose modestly, by around 60 per cent in the years 1820–39 and subsequently stagnated to 1850 (Hoffmann 1955, Table 54). New South Wales wool captured a rising share of the British market, at the expense of other exporters and British farmers. Australian supply rather than British demand led the expansion of New South Wales pastoralism after 1820. The value of wool in interior New South Wales was near zero before 1820, with fleece sometimes discarded as waste by meat farmers (Butlin 1994, pp. 171–4). Thereafter, Australian supplies helped to depress the price of wool in London, but the value of wool rose in New South Wales as the international commodity price gaps narrowed. Concomitantly, the rent extracted from the native grasslands of south-eastern Australia rose. For the squatters, the price of the land was near zero, and the costs of raising sheep, clipping and transporting the greasy wool were modest. The pastoralists extracted the natural resource rents that underpinned Australia's high incomes per capita in 1850.

Without hindsight the prospects in 1850 for future Australian development appeared uncertain. The fertile south-east crescent had been occupied, and utilising the drier, less fertile lands of the north and west for pasture or cultivation would need investment and new technology. The linkages from wool to transport and processing were modest, and the limited diversification opportunities raised the spectre of a staples trap (Schedvin 1990). Wool did support the capacity of the colonies to import, when the contribution of British subsidies was falling. New colonial bridgeheads, which would aid future growth, had been established; indeed, the boundary of New South

Wales was extended to include New Zealand in 1839. Further, by the 1850s, Australia was well down the road to representative governments, which diminished any possibility of a landed, pastoral elite dominating polity with detrimental development effects. However, natural resource rents can only be invested for future development if extracted. In 1850 the prospects for the rural industries to greatly augment their rents from Australia's natural capital were uncertain.

1850–90: augmenting and depleting the resource economy

The first pastoral boom was faltering in the 1840s, although slower population growth ameliorated a tendency towards GDP per capita retardation. A widening of natural resource exploitation in Australia also dates from the 1840s with the mining of copper in South Australia, and the finding of gold specimens in New South Wales and Victoria. A leading minerals historian postulated the search for gold intensifies when other trades slacken (Blainey 1970). Certainly, a succession of minerals discoveries augmented Australia's natural capital in the period to 1890 and beyond. Most dramatic were the Victoria gold finds of 1851. Later discoveries included further copper deposits in South Australia in 1861, gold in Queensland 1867 and 1871, silver and lead at Broken Hill in New South Wales in 1882, and gold in Western Australia in 1887–88. The major gold finds at Coolgardie–Kalgoorlie, Western Australia date from 1892. Some coal was mined in New South Wales but the quantities were small, reaching 3 million tonnes by 1890, and iron ore was mined intermittently, including several thousand tonnes in the 1870s (Vamplew 1987, pp. 90–2).

Gold apart, the mining sector did not challenge the dominance of pastoralism before 1890. Australia's natural resource utilisation was also extended by bringing more land into use. While the squatters occupied around 55 million acres of New South Wales pasture in 1850, by 1890 grazing and agricultural land use in New South Wales extended to 175 million acres (Vamplew 1987, p. 73). Much of the expansion took place in the more arid areas of mid and western New South Wales and needed heavy investment in fencing and water supply. The pastoral frontier also spread quickly through Queensland, where recorded land use – chiefly for cattle and sheep stations but cotton and sugar were cultivated – reached 285 million acres by 1890 (Vamplew 1987, p. 74). The opportunities for extending pastoralism in Victoria and South Australia were modest; there the main shifts were towards cultivation of wheat, but

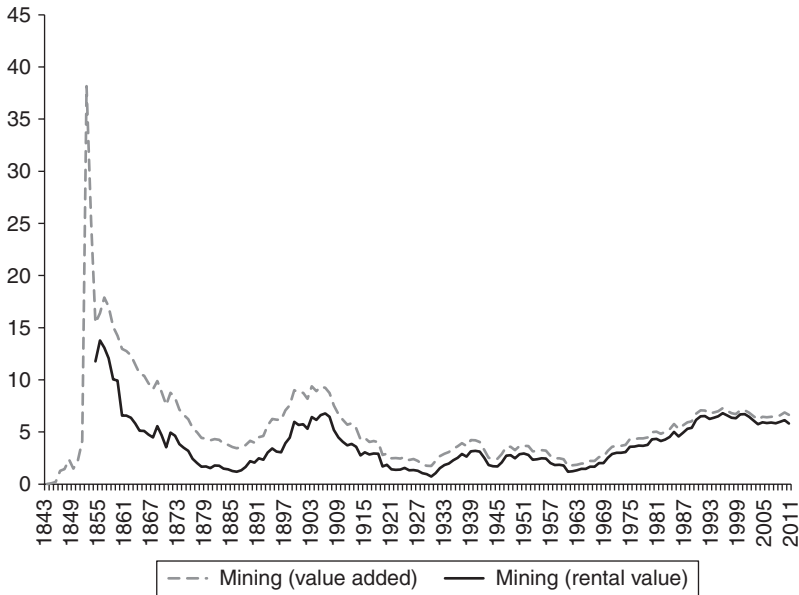


Figure 7.1 Mining value added and rents (% of GDP)

Sources: Vamplew (1987), pp. 131–3, 147; ABS, cat. no. 5206.0 (various dates); Hutchinson (2013); Withers, Endres & Perry (1987); Maddock & McLean (1984). Mining employment before 1890 is interpolated from occasional estimates of its share in total employment, following Battelino (2010).

also of fruit and vegetables. The 400 000 acres of Australian land cultivated in 1850 rose to 1.4 and 5.7 million acres respectively in 1865 and 1890. Around 80 per cent of cultivated land in 1890 was in South Australia and Victoria. Western Australia developed more strongly from the 1880s, as a pastoral, agricultural and mining colony.

Industrialising Australia's natural capital took varied paths after 1850. More land was used as pasture and for cultivation, and minerals were extracted. Gold took centre stage in the 1850s, and provided a powerful shock to the small, prosperous economy of south-eastern Australia. Alluvial gold extraction in Victoria was labour-intensive, and its chief longer-term consequences may have been demographic. Australia's population doubled in the years 1851–55 and exceeded 1 million by the end of that decade (Hutchinson 2013). Most new immigrants were working-age males and mining provided around 30 per cent of Victoria's employment during the boom. Australia's nominal GDP tripled during 1851–53, whereas prices rose by around 75 per cent; hence, real GDP rose by around 40 per cent (Hutchinson 2013). Mining value

added peaked at 38 per cent of GDP in 1852, around three times as much as pastoralism (Figure 7.1).¹ Thereafter, mining's contribution declined to below 5 per cent of Australia's GDP in 1890, less than half that of pastoralism. Gauging how the gold bonanza influenced the trajectory of GDP per capita raises complex issues, with conflicting interpretations. On balance historians have seen the gold shocks as having positive and sustained influences on development (Sinclair 1976; Jackson 1977). McLean (2013, p. 80) argues that the gold rush was a favourable shock to extensive and intensive growth.

Maddock and McLean (1984) offer sophisticated analysis of how the sudden wealth from the gold boom impacted on Australia's small, open economy. Gold exports boomed and wool exports slowed, but industries not subject to international competition gained, including those provisioning the miners. Butlin (1986b) alternatively argues the gold shock was chiefly monetary and transitory, complicating an expansion already underway in rural and urban Australia. Butlin receives support from Greasley and Oxley (1997), who show unchanging trend GDP per capita during 1828–90, highlighting that the gold shocks were not a discontinuity in intensive growth. Alternatively, Australia's population growth rate shows retardation through the 19th century, except for the spike of 1851 (Hutchinson 2013). The population spike augmented GDP (Greasley & Oxley 1997). Remarkably, the jump in population did not diminish trend GDP per capita. Collectively, the higher working-age population, the gold rents (measured in Figure 7.1 as mining value added less labour costs),² and a second pastoral boom from the 1870s maintained the natural resource–population balance to 1890 to sustain GDP per capita growth.

The gold shocks meant the size of Australia's economy grew, more than three times in the 1850s, while trend GDP per capita was sustained to 1890. In that sense, the gold extraction was associated with a bigger and richer economy. In 1852 Australia's GDP per capita overtook that of the United Kingdom, and led the world. Alluvial gold mining did not need much fixed capital or technology. The key input was labour, and by awarding licences for small workings, Victoria's legislature encouraged labour inflows to the fields,

1 In Figure 7.1 mining rents are defined as the value of production less marginal extraction costs, measured here as wage costs. Butlin's GDP estimates, as reported in Hutchinson (2013), are used as the denominator. Butlin's estimates are more plausible than those of Haig (2001) for the period 1861–1911, since the latter deploy relatively few production series; see Maddison (2013). Also, Haig does not estimate the nominal GDP. Hence, although Haig's post-1911 estimates are more firmly based and show less disparity with Butlin, they are not used.

2 The wage data are from Maddock and McLean (1984) and Hutchinson (2013). For mining employment and value added, see Battelino (2010).

from other colonies and overseas. Generally, the new immigrants stayed in Australia, with longer-term consequences for population, the workforce, and both public and private investment (Hall 1963). One connection to public investment arises from the public revenue gained, initially from licences and then export taxes. The licences needed annual renewal, which deterred labour from staying in mining, but the restrictions on the size of claims ensured the extracted gold rents, in contrast to pastoral rents, spread widely. Subsequently, low gold export taxes encouraged rapid exploitation, a policy more akin to the rapid extraction of North Sea oil in Britain in the 1980s, than Norway's more measured depletion and reinvestment of resource rents.

Gold generated public revenue but increased public spending, including on administration and policing. The extraction of the gold rents markedly improved the creditworthiness of the colonial governments in the London capital market. Victoria led with a £8 million debenture in 1858 to facilitate railway construction, including by assisting the immigration of labourers. Other public spending – for example, on health (water supply and sewerage) and education – was facilitated by the gold rents, with likely developmental benefits. The easy credit may have contributed to a 'governmental habit', with adverse consequences for capital productivity. During 1865–89 gross public fixed capital formation was around 38 per cent of overall fixed capital formation. Around half public investment was in railways (Davis & Gallman 2001, pp. 493–4). Mining needed modest investment; it took around 1.2 per cent of gross fixed investment during 1865–89. A key issue is whether or not the extracted gold rents, which averaged around 3.1 per cent of GDP during 1861–90, were productively reinvested to benefit intensive growth.

Genuine savings, sometimes called comprehensive investment, treat resource depletion as disinvestment that needs to be offset by other capital formation for consumption per capita to be sustained (World Bank 2006). Most gold rents accrued to the private sector and their utilisation cannot be fully traced. Minerals depletion, though, can be compared to the formation of other capital stocks, both produced and natural, where the latter includes farmland. Net domestic capital formation was around 9 per cent of GDP during 1861–90, sufficient to offset the minerals depletion. However, much of Australia's domestic capital formation, especially during the 1880s, resulted from net overseas borrowing. Net national capital formation averaged around 5.4 per cent of GDP during 1861–90 (Butlin 1962); see Figure 7.2.

Australia's net national savings rate before 1890 appears barely sufficient to offset the gold depletion. However, certain elements of genuine savings, including spending on education, are not included in the produced capital

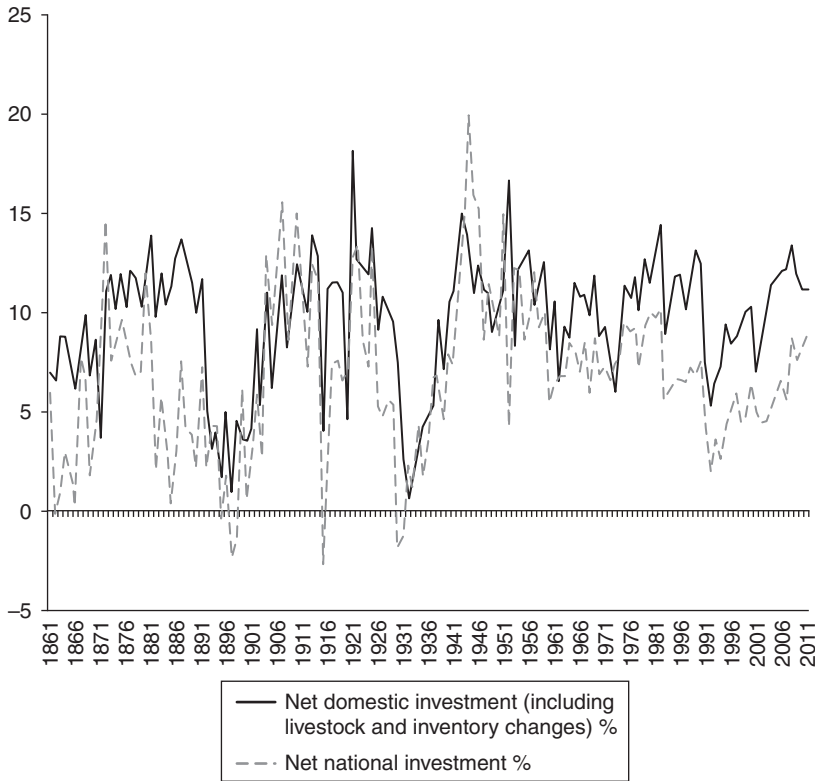


Figure 7.2 Net domestic and national investment (% of GDP)

Sources: Vamplew (1987), pp. 134–7, 191–8; ABS, cat. no. 5206.0 (various dates).

formation estimates. Another possible escape route from a low national savings ratio was to default on the interest charges arising from private overseas debt, but there was no default on public debt. Of more importance for Australia's genuine savings are the increments to natural capital arising from the land frontier. To some extent the natural capital depletion from mineral extraction was offset by bringing more land into use.

Australia's farming frontier extended in the period to 1890. A second pastoral boom led to wool being restored as Australia's leading export in the 1870s, and to account for around 57 per cent of exports in the 1880s. The sheep flock grew from around 15 to 86 million in the period 1850–90, chiefly by extending the pastoral frontier in mid and west New South Wales and Queensland (Vamplew 1987, p. 81). In 1890 pastoralism contributed 13 per cent of GDP, more than the shares of mining and agriculture combined.

In assessing sustainability, account needs to be taken of the increments to natural capital (the rental value of the new land) from frontier expansion to more arid areas. Land use in New South Wales rose by around three times during 1850–90, and 285 million acres were occupied in Queensland by 1890 (Vamplew 1987, p. 73). On a conservative estimate land use in eastern Australia rose by around seven times during 1850–90, possibly matching the rise in population. Another 110 million acres of land was in use in Western Australia in 1890. Generally, the new farmland was in less fertile regions with relatively low rental values.

The rental value of the new lands partially offset the rents extracted by minerals depletion. In addition to direct estimates, land's increased rental value is approximated with estimates of its capacity to support animals. The sequence of net *domestic capital formation* plus livestock accumulation, less net overseas borrowing, leads to a concept of net *national capital accumulation* (Butlin 1962, p. 5). If livestock accumulation mirrors land rents, its value provides a simple approximation of augmented land values. Livestock were an important part of Australia private assets, and changes in their value are often large compared to conventionally defined capital formation in the 19th century.

Sheep and cattle stocks increased by around five and a half times during 1850–90, a slower pace than the expansion of land, reflecting the frontier shifts towards arid land. The second pastoral boom needed substantial fixed capital formation, most especially in fencing and supplying water via wells and reticulation systems. Nomadic sheep farming was not viable in the more arid areas of New South Wales and Queensland. A shift towards more capital-intensive pastoralism occurred in the 1870s, and the leading authority highlights the profitability of this investment against a backdrop of rising wool prices (Butlin 1964, p. 96). Wire fencing led, with around 700 000 miles erected in New South Wales in the 1870s to develop paddocks. The paddocks reduced shepherding costs, improved lamb survival, and fleece and sheep quality. By the 1880s, with the pastoral frontier in arid areas, investment in water conservation was essential. Artesian water helped, and sheep numbers tripled in Queensland during the 1880s, but wool prices fell.

The pastoral investment was partly motivated by beliefs that capital gains would accrue from the growing herds. In a sense, the rents extracted from the new land were embodied in the increased stock value of sheep and cattle. Much of the pastoral investment of the 1880s was debt-financed and domiciled overseas. Interest on the debt accounted for a rising share of wool receipts during the 1880s when wool prices fell. In the 1890s new pastoral

investment collapsed. Overstocking, drought, rabbits and the deterioration of pasture and the animals were all factors accentuating the sector's decline against a backcloth of low wool prices. The rise in value of Australia's natural capital associated with frontier and animal stock expansion during the second pastoral boom was reversed.

In the period 1861–90 the average annual gain from increased livestock was around £1.5 million or 1.05 per cent of GDP (Butlin 1962, pp. 62–7). Thus, while net national capital formation averaged around 5.4 per cent of GDP during 1861–90, net national capital accumulation averaged 6.5 per cent of GDP. The difference probably reflects an upper bound of the incremental gain in natural capital from bringing more land into use, since part of the herd increase depended on conventional capital formation in fencing and water supplies. Given extracted mineral rents averaged around 3.1 per cent of GDP over the same period, Australia's genuine net savings rate was probably not much above 3 per cent of GDP, at a time when its GDP per capita led the world.

Direct estimates of increased land rental values are necessarily simplifications, but they offer some corroboration for the values imputed from livestock increases. Taylor (1992b) surveys the alternative estimates of Australian land values, based on Crown land sales or local government rating assessments, for New South Wales, Queensland, South Australia and Victoria. The rating valuations show generally rising assessments from 1860, partly reflecting rising rental values in the longer-settled areas, especially in the municipal districts, and also the value of improvements. In contrast, the average selling price of Crown land in 1862 was £0.92 per acre, and in 1890 it was £0.84 per acre (Taylor 1992b, p. 15).

Crown land sales were an alternative to issuing debentures in London, and the quality of land sold varied year to year. The idiosyncrasies of Crown land sales complicate interpretation of average prices in any year, but they offer a better reflection of frontier price trends than the ratings valuations. For New South Wales and Queensland, the average value of Crown sales was £0.77 per acre in the period 1862–90, and rental values are taken as 10 per cent of the capital value. Pastoral land increased by around 400 million acres during 1862–90, giving an average annual rental gain of around £1 million, which may be compared with the £1.5 million average gain from livestock accumulation over the same period. Accordingly, new pastoral land added between 0.7 and 1.05 per cent of GDP to genuine savings each year, with the lower bound estimate based on the average value of Crown land sales, probably better reflecting the gains in natural capital from new pastoral land.

The pastoral boom peaked in 1891 when wool accounted for around 60 per cent of total exports. Land under cultivation rose, by around 5 million acres in the years 1850–90, but the volumes were dwarfed by pastoral land expansion. Even allowing for the higher rental values in agricultural areas (average South Australia Crown land sale prices of £1.28 per acre during 1862–90 were two-thirds above the New South Wales and Queensland averages), cultivated land's contribution to augmenting Australia's natural capital to 1890 was modest, and equal to around 2 per cent of the increased value of pastoral land. The wheat frontier moved quickly northwards through South Australia during the 1870s (Meinig 1963). Yields were surprisingly high in areas of unreliable rainfall, encouraging the idea that 'rain would follow the plough'. Earlier, Surveyor-General Goyder had identified a 'line of rainfall' roughly demarcating the pastoral areas to the north from lands suited to cultivation.

Goyder's Line was breached in 1874 when all unappropriated South Australian land was opened to selection. Land was surveyed before sale, but the Crown abandoned planned, concentrated settlement to balance population with land occupation in South Australia. The settlers set the pace of frontier expansion, which gathered momentum during 1875–80. Harvests were good and peaked in 1879–80. The new technology of the 'stump jump' plough and ancillary investment in ports and railways added zest to the optimism surrounding the wheat bonanza. The limitations of Australia's natural resources are highlighted by wheat farming in South Australia. The droughts of the early 1880s ended the frontier expansion. Yields collapsed, farms were abandoned and South Australia's wheat boundary retreated to the south of Goyder's Line. Thereafter, the wheat acreage of South Australia remained near stationary for 30 years.

The challenge to wool from alternative farm exports faded following the reversals of South Australia wheat farmers. Grains and meat accounted for 14 per cent of exports in 1891, sugar and butter 1 per cent, and timber around 0.7 per cent (Boehm 1971a, p. 100). Beef cattle were an integral part of the northward shift of the pastoral frontier during 1850–90. Queensland became the dominant beef cattle colony in these years. In northern areas the heavy summer rains, lush grass and high humidity suited cattle more than sheep, and the cattle could be driven further to water during the dry season (Davidson 1972, pp. 68–9). Initially, Queensland cattle were driven to the consumers in southern colonies, but railways provided alternative transport for the inter-colony trade by the 1870s. The first Australian frozen meat arrived in London in 1880, following experiments with freezing technology in the two previous decades. Australian tinned meat was shown at the Great

Exhibition in 1851 and commercial shipments date from 1867. Meat exports in the 1880s were less volatile than wheat, but they lagged behind the volumes of the other southern hemisphere suppliers, Argentina and New Zealand. In 1890 New Zealand's meat exports were around three times those of Australia (Mitchell 2003, p. 185). The cross-Tasman neighbours also led with cheese and butter exports. Indeed, Australia was a large importer of butter, wine, cheese, meat and fruits in 1890.

Australia's comparative advantage still lay with wool. New Zealand wool farmers in the 1880s had the greater need to find alternative exports, given the competitive advantages of the New South Wales sheep growers. However, Victoria's government was sufficiently concerned about narrow export specialisation in 1889 to introduce grants to aid the agricultural, dairying, fruit and wine industries (Boehm 1971, p. 109). Generally, these initiatives were designed to support smaller farmers and to encourage quality improvements in dairy products and fruit, by education as well as subsidies (Fitzpatrick 1941, p. 373). Nevertheless, New Zealand's cheese and butter exports outpaced those of both Victoria and New South Wales. Tropical agriculture made some progress in Australia, with the cultivation of cotton and sugar from the 1860s, partly because of the short-lived cotton famine during the American Civil War. Sugar, though, continued to grow rapidly through the early 1880s, but declined later in that decade as sugar beet production surged in Europe (Graves 1993, p. 19).

There are signs of diversity and more intensive Australian land use in the 1880s, but the developments were tentative. Aside from wool, minerals were the substantial export earner, with around 20 per cent of the value. The natural resource industries underpinned Australia's capacity to import and to service overseas debt during 1850–90, but they remained narrowly based. New refrigeration and canning technology opened opportunities for meat, dairy and fruit exports, but only modest progress was made before 1890, and the export–GDP ratio fell to around 15 per cent in that year (Boehm 1971). The continuing capacity of the natural resource industries to lead or support the wider, urban economy, and to sustain world-leading GDP per capita was under threat by 1890, both from the bursting of the wool boom and the depletion of minerals.

Australia's natural resource industries and its wider economy faltered in the 1890s for a combination of reasons. The immediate prospects for further wool growth were uncertain as the pastoral frontier reached arid regions and wool prices slumped. In the longer-term careful breeding and herd management offered some opportunities for augmenting profits and wool export

volumes grew again from 1901, in a variety of markets (Ville 2005b). Similarly, while mineral extraction depletes natural capital, new discoveries can ameliorate the decline in rents. The major new gold finds at Coolgardie–Kalgoorlie were on the horizon, but the substantial iron ore and coal trades with Japan and China were in the distant future. In 1890 wool and gold were Australia's high-productivity industries, and a lessening of their importance had direct, adverse effects on aggregate productivity (Broadberry & Irwin 2007).

Whether or not the stumbling of the resource industries around 1890 was a hiatus or a watershed in Australia's long-run development warrants careful assessment. One possibility is there was a staples trap associated with 'midas and merino', which limited enterprise and technological progress in the wider economy (Schedvin 1979). Gold was extracted, and exported, with limited direct impact or stimulus to other production activities. Sheep flocks expanded, and the greasy wool exported, but again the production linkages within Australia appear modest, although wool markets shifted to Australian port cities after 1890 (Merrett & Ville 2013). Australia's natural resources had facilitated the construction of urban and transport infrastructure. There was a remarkable period of extensive and intensive growth in the years 1850–90. At issue is the extent that secure foundations for sustainable economic development were laid by extracting mineral rents and extending the farm frontier.

Australia had comparatively low national savings during 1850–90, and a correspondingly high predilection for consumption. A comprehensive measure of net national accumulation, sometimes called green investment, which includes increments to land use and the depletion of minerals, averaged around 3 per cent of GDP. Around one-quarter of investment was residential, and no matter how much needed, did not add to productive capacity. Railways, constructed by public investment, accounted for around 18 per cent of capital formation, and overall public investment was around 38 per cent of total investment. There has been much debate about the misdirection of public investment – for example, towards arterial railways – but what stands out are the low national investment rates, which appear barely sufficient to sustain longer-term intensive growth. Domestic investment was higher because of the capital inflows, but British appetites for Australian ventures faded after 1890, following the losses in the pastoral and financial sectors, and the uncertainties surrounding the creditworthiness of colonial governments. Adverse capital market sentiments towards Australia contributed to the severity of the 1890s depression, with a collapse of capital inflows reinforcing the effects of low national savings.

Low rates of accumulation to 1890 were associated with internationally high GDP per capita because of high productivity in the pastoral and mining sectors. Australia's farm labour productivity (principally because of high pastoral productivity) was around three and a half times higher than in the United Kingdom in 1891 and Australia's mining productivity was around two and a half times higher (Broadberry & Irwin 2007, p. 267). Mining's share of employment fell from 17.9 per cent to 5 per cent during 1861–91, diminishing its impact on economy-wide productivity. The sheep flock commenced a period of decline from around 1890, which reduced the contribution of pastoralism to aggregate productivity. New directions and higher accumulation were needed to avoid the staples trap and to restore intensive growth. The new opportunities lay partly in manufacturing and services, but also in the more intensive use of land and a more varied exploitation of minerals.

1890–1914: short breath and new winds

The hiatus in Australia's economic development was protracted but transitory. Eventually, from the 1930s, the pace of GDP per capita growth accelerated, but it was not until the 1960s that levels of GDP per capita were higher than they would have been had pre-1890 growth rates been sustained (Greasley & Oxley 1998, p. 308). The long interregnum highlights the genuine sustainability issues Australia faced by the 1890s. Growth chiefly based on expanding the pastoral frontier was no longer viable. Further expansion of rural industries was possible, but it would rest on more intensive land use and extending the area under cultivation. Likewise, minerals depletion was tempered by exploration, discovery and better extraction technology. These escape routes were accompanied by the growth of manufacturing and services. Australia was not caught in a staples trap or afflicted by a resource curse that diminished GDP per capita in the long run. The adjustment, however, was prolonged, and associated with a relative incomes decline that lasted through the 20th century.

The sheep flock fell sharply in the 1890s and land in use stagnated in eastern Australia. The financial crisis along with the adverse overseas sentiments hindered readjustment, and real GDP per capita did not regain 1890 levels until 1907. Within the contours of decline and slow recovery, new patterns of land use and minerals exploitation began to emerge. The cultivated area expanded, and New South Wales became Australia's leading wheat producer, benefiting from rising grain prices after 1895. In Victoria, the chief expansion was dairying; the colony's butter exports matched those of its grains

and meat by 1900. South Australia's rural industries, chiefly grains, fared less well, against a backcloth of drought, whereas meat exports compensated for the decline of wool in Queensland. Western Australia grew rapidly in the 1890s, and by 1900 its GDP per capita was similar to that of the eastern colonies (Cashin 1995). The new gold finds added impetus to Western Australia's growth, but the colony's relatively small size limited its contribution to Australia's overall growth. The adjustments in Australia's rural economy were regionally diverse, with Queensland and Western Australia achieving positive growth in the 1890s. Nevertheless, the relative slide of Australia's internationally high incomes was sharp.

California, and indeed New Zealand, had GDP per capita that was 40–50 per cent above that of Australia in 1900 (Greasley & Oxley 2010, p. 443). The two Pacific, resource-rich western offshoots surged ahead, and exploring why sheds light on Australia's development. California was the United States' second largest wheat state in 1890, but by 1910 it was a net importer of wheat, and supplied fruit and wine to eastern consumers. Underlying the transformation was a shift from land-extensive to smaller, capital-intensive, irrigated farms (Rhode 1995). The shifts to closer settlement were driven by capital flows from eastern states, skilled immigrants, fast freights and prosperous eastern consumers. In contrast, New South Wales shifted in the 1890s towards wheat, an increasingly land-extensive commodity – average farm size reached 862 acres in 1896, with modest scope for adding value (Dunsdorf 1956, p. 117). New Zealand also moved from wheat (and wool at a faster pace than in Australia) to closer settlement, dairying and frozen meat exports. The surge in New Zealand's income per capita in the 1890s was at a faster pace than Western Australia or Queensland. New Zealand's prosperity contributed, along with fears of protectionism, to the Dominion standing aside from the Federation of 1901. Another western offshoot, Canada, achieved faster growth than Australia after 1890. It appears likely that eastern manufacturing, rather than prairie wheat expansion, underpinned Canada's faster intensive growth (Chambers & Gordon 1966).

Generally, the rural shifts in California and New Zealand were towards smaller farms, more intensive land use, and the integration of farm and factory for the value-adding processing of milk or fruit. Land-intensive farming was skill- and capital-intensive. Intensive farming developed more slowly in Australia, reflecting a range of influences. Geography and climate varied between the three regions, and on balance those of Australia favoured extensive farming. Queensland cattle stations had more in common with Texas or Montana ranches, and the wheat farms of New South Wales greater

similarity with those of Kansas, than with California's capital-intensive farms. Similarly, dairying expansion in Victoria was within a markedly different environment to the North Island of New Zealand where summer rainfall supported the cultivation of year-round grass. Geography and climate, though, are not complete explanations of Australia's tardier development of land-intensive farming.

Among Australia's rural industries the strongest shifts were towards increasingly land-extensive wheat farms in New South Wales. Cultivated acreage doubled in the period 1890–1913. Dunsdorf (1956, p. 115) shows how the wheat belt expanded in areas of lower rainfall, helped by railways and the selection of new varieties. Yields per acre were lower, but there was an offsetting rise in farm size and labour productivity facilitated by mechanisation. Production outpaced domestic demand, with 60 per cent of wheat exported during 1909–14, partly because of increased West Australian cultivation. Wheat, as an export staple, had deeper linkages to supplying sectors, including machinery, seeds, transportation and processing, than wool, and provided useful stimulus to the wider economy. New South Wales, however, was less well placed than the Canadian prairies to take advantage of slower United States frontier growth and rising prices in the world wheat market. A corollary of Australia's increased specialisation in wheat was a slower shift towards more land-intensive mixed dairy and fruit farming, which underpinned the faster incomes growth of California and New Zealand. In 1910 New Zealand exported almost as much frozen meat as Australia and around 40 per cent of the butter, despite having a population less than a quarter the size.

Australia's rural industries diversified during 1890–1914, but the changes were tentative and wool, buttressed with wheat, dominated. The lesser growth of the newer, refrigerated trades in meat and dairy led to a diminishing Australian share of British imports. Argentina's exports to the United Kingdom exceeded those of Australia by 1912. Queensland's beef exports grew, but the pace of new investment in water supplies and freezing plants was retarded by the financial crisis that left many stations bankrupt. The cattle frontier's shifts to north Queensland was also hindered by tick-borne disease. In the case of dairying, closer settlement, the cultivation of grass and cooperative creameries were the key ingredients to competing with northern hemisphere producers in the British market. Victoria's governments provided some support to small farmers, but dairying practices lagged those of Denmark and New Zealand (Millar Smith 1936, p. 205). Other examples of more intensive land use occurred in Queensland with cane sugar, and with fruit and wine in Victoria and South Australia (Fitzpatrick 1941, pp. 349).

Federation in 1901 removed internal tariffs, giving impetus to South Australian wineries, although Australian wines made limited progress in European markets before 1914 (Walsh 1979).

The pace of diversification and the shifts towards closer settlement in Australia trailed the leading rural economies before World War 1, only partly because of the climate and landscape. Australia had other disadvantages relative to California and New Zealand. There was a greater unity of development purpose in New Zealand, which was reflected in policies towards closer settlement (Hawke 1979). Land taxes and the compulsory repurchase and subdivision of great estates had greater force in the Dominion. In contrast, Australia was less homogeneous, and the conflicts between the colonies in relation to public policy were greater, although attempts were made to follow New Zealand's lead in state advances to farmers and the repurchase of alienated land (Fitzpatrick 1941, p. 350). The voluntary repurchase and closer settlement schemes had occasional success – for example, in stimulating Queensland dairying – but the overall impact was limited (Roberts 1924, pp. 307–35). In contrast, by 1900 California's land-intensive farms were a part of well-integrated national markets for goods, capital and labour within the protected American market. The more heterogeneous population of the United States may also have conferred skills advantages to California – for example, in relation to Mediterranean fruits and wine.

The wider-world shifts towards more capital-intensive farming coincided with adverse sentiments towards Australia in international capital markets, which impeded new rural investment in the 1890s. Net national capital formation was negative in some years and averaged 2.23 per cent of GDP during 1890–1900 (Figure 7.2). Mining, though, did attract overseas investors. Around 690 West Australian mining companies were floated in London by 1896, taking advantage of weak investment demand elsewhere and the development of 'no liability' companies (Battelino 2010). The extraction of mineral rents rose during the 1890s, and averaged 3.6 per cent of GDP for the decade (Figure 7.1). The depletion implies Australia's green investment (net national accumulation less extracted mining rents) and genuine savings, which includes public education investment, were negative during the 1890s, and on these criteria its long-run consumption per capita was unsustainable (Figure 7.3). Green investment and genuine savings are of similar magnitude before 1945, given the low education investment.

The barriers to regenerating the rural economy in the 1890s were severe, but Australia's consumption of mineral rents provided respite. Gold and Western Australia led the minerals recovery. From a 2 per cent low point in 1890, gold

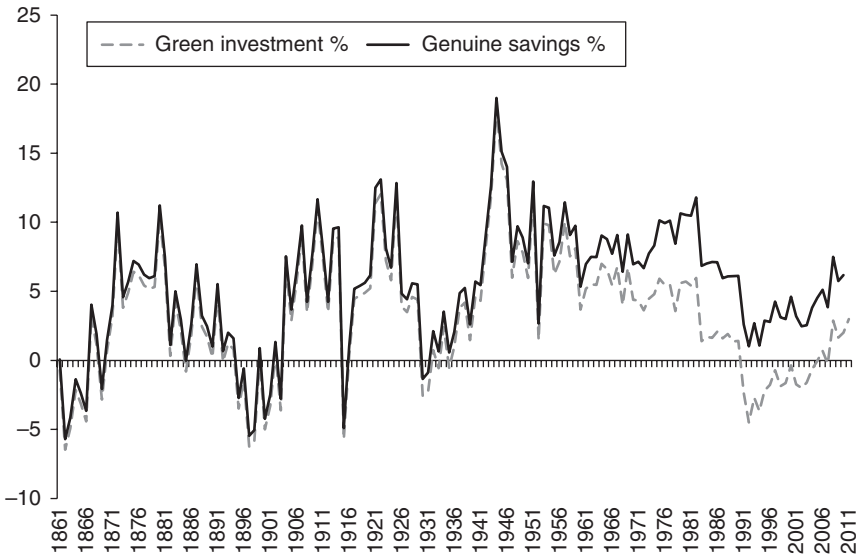


Figure 7.3 Green investment and genuine savings (% of GDP)

Sources: As for Figures 7.1 and 7.2. Education investment: ABS (2001); Vamplew (1987), pp. 372–3. Pre-1901 education investment is assumed to be a constant share of GDP equal to the 1901 ratio.

mining's share of GDP rose to around 6 per cent during 1903–05, before returning to below 2 per cent in 1913. Gold provided a much needed fillip to domestic activity and exports when other sectors were depressed. The value of silver and copper production also grew, peaking at 1.6 per cent and 1.2 per cent of GDP in 1908 and 1907 respectively. Coal was the only other mineral to contribute more than 1 per cent of GDP in the early-century mining boom, but zinc and iron ore added to minerals' collective share of GDP, which averaged around 9 per cent during 1899–1907. The value of the extracted mineral rents was lower, at around 6 per cent of GDP, because of the marginal extraction costs (Figure 7.1).

Consuming mineral rents does not provide a pathway to sustainable development, but the mining boom offered breathing space for Australia's battered economy, including the rural industries, to recover. Mineral rents relative to GDP peaked in 1906, and thereafter experienced secular decline to the 1960s. The new century witnessed wider recovery, most especially in net national capital formation, which averaged around 9.8 per cent of GDP during 1901–13, over half of which was private investment (Figure 7.2). Australia achieved current account surpluses in that decade; hence, national exceeded domestic

capital formation. Minerals were depleted, but the livestock disinvestment ended in 1903, and the value of livestock accumulation averaged around 0.6 per cent of GDP during 1901–13. Australia's genuine savings were positive in the first decade of the new century, and a sustainable development path had been restored, although its trajectory was soon punctuated by world war and depression.

The pastoral and agricultural sectors contributed a smaller share of produced investment in the new century, around 10 per cent in the period 1900–14, compared to around 25 per cent during the pastoral boom of 1865–89 (Davis & Gallman 2001, p. 493). Mining investment grew and accounted for around 4 per cent of investment during 1900–14. Most of the new investment was outside the mining and farm sectors, with industrial and commercial investment providing 15 per cent of total investment during 1900–14. In an important sense, the redirection of Australia's economy following the depression of the 1890s was away from the natural resource industries. The rebalancing of Australia's economy after 1900 does not mean natural resource industries became unimportant; they continued to dominate Australia's exports through the 20th century. Mining, temporarily, became less important after 1906, until the sequence of new booms from the 1960s restored the sector's export prominence.

Looking backwards and forwards

The utilisation of land and mineral resources through the 19th century transformed Australia and its population's material wellbeing. Natural resources were undoubtedly a blessing for the European settlers and their descendants, although landscape and climate were often unkind. Industrialising Australia's natural resources needed human, institutional and produced capital to enable the extraction of natural resource rents. The settlers brought European skills, and animals and plants from the wider world, but adapting to a new environment was an important ingredient of their success.

The native grasslands of New South Wales were a boon, but one that was exploited by the squatters' enterprise, and by the technology of fenced paddocks and supplying water as the frontier moved towards the more arid north and west. Grain farming needed transport investment, and seeds, ploughing and reaping technology suited to semi-arid, often root-infested land. Successful exploitation of the land rested on institutions, enterprise and the development of skills suited to Australia, as did the finding and the extraction of minerals. The local technological progress was forthcoming but with the

caveat that the processing of wool, minerals and to some extent grains was limited by Australia's comparative advantages. Concomitantly, Australia's 19th-century prosperity was shaped by its expanding utilisation and extraction of natural resources relative to its population growth.

The expansion of the resource industries was chiefly driven by Australia's capacity to supply farm products and minerals, although the vagaries of external demand accentuated the investment cycles. There was a market for wool and gold in the wider world throughout the 19th century. Land was cheap or free within Australia, which allowed resource rents to be captured, if the natural capital could be exploited. It was, and international commodity market integration drove upward the value of Australia's natural resources. The enterprise and technology of the resource industrialisation and rent extraction took place within an institutional framework shaped by colonialism and geography. Geography and land-extensive pastoralism gave impetus to the formation of landed elites, and to the possibility that polity would be dominated by the occupying squatters. The retaining of land and minerals ownership by the Crown, however, paved the way for subsequent representative governments to distribute the resources rents widely. In part, a resource curse was avoided because Australia's institutions facilitated deeper enterprise than, say, in the southern states of the United States or Latin America.

Australia's institutions allowed the gold rents to spread widely and, eventually, for smaller farmers to select land suited to intensive agriculture. Land sales, mineral licences and taxes helped to fund infrastructure and investment in health and education, to support economic development. There are caveats, and Australia's institutions sometimes limited the national market and enterprise. There were tariff barriers between the colonies, which contrasts with the experience of national market formation in the United States. The colonies also directed the public construction of railways, and the routes reflected the priorities of individual colonies, rather than a national market. The support given to smaller farmers also varied between colonies. In part, landscape and climate shaped efficient farm size, but institutions played a role. The power of the pastoralists was tempered, but graduated land taxes and the compulsory repurchase of great estates had greater force in New Zealand than Australia, and illustrate the greater priority given to closer settlement across the Tasman. Australia developed land-intensive mixed dairy and fruit farming, but more slowly than in New Zealand or California, whose incomes surged ahead after 1890.

The depression of the 1890s also casts doubt on how well the natural resource rents were utilised. Australia's net national savings were low since

the 1860s, remarkably so given the construction of a new settler economy. British subsidies and capital were alternatives to national savings, and latterly the ability to extract resource rents, from new land and minerals, facilitated growing incomes. Natural resource exploitation expanded with the population to the 1890s to support a bigger and a richer economy, given the high productivity of mining and pastoralism. As minerals depleted and the limits of the farm frontier approached, sustaining Australia's high incomes became problematical, and there was a downshift in trend GDP per capita growth in the 1890s, which had long-lasting effects. Yet, by the 1960s, Australia's average incomes were higher than levels that would have been attained simply by projecting pre-1890 growth rates. The eventually superior performance of Australia's economy in the 20th century and beyond poses interesting questions for the debates surrounding natural resource utilisation and economic wellbeing in the long run.

Looking forward from the 1890s, the natural resource industries grew in various directions. The early 20th-century mining boom quickly faded, but re-emerged in the 1960s with a surge in iron ore exports to resource-poor, but rapidly industrialising, Japan. For Wright and Czelusta (2002, pp. 12–14) the interregnum arose from a paucity of mining expertise within Australia, and from regulations that hindered discoveries. McLean (2013, pp. 170–3), alternatively, highlights the limited demand for minerals within Australia, and links the resurgence of the 1960s to new overseas demands and bulk shipping innovations. Estimates of Australia's net barter terms of trade, which show secular decline during the period 1954–2000, run counter to overseas demand shocks initiating the minerals revival (Bhattacharyya & Williamson 2011). There has, however, been a sustained rise in the real price of Australia's mineral exports since the 1970s, to encourage continuing investment.

As with 19th-century wool exports, it was Australia's capacity to supply a larger share of the world market – shaped by the interplay of institutions, technology and enterprise with natural capital – that drove the mining resurgence. When the export restrictions were lifted and state support for mining gathered pace, new finds were made, to the extent that Australia's iron ore reserves rose 40-fold in the decade to 1967, before the surge in mineral prices. Thereafter, Australia's demonstrated reserves of 22 minerals, including all the major ones except bauxite, rose until 1999 as new discoveries outpaced production. However, Australia trailed Canada and some Latin American countries in non-ferrous metals growth in the period 1978–98 (Wright & Czelusta 2002, p. 43). Asian industrialisation added impetus to mineral extraction in Australia and the wider world. Australian producers gained a larger share of

the world market, including of bauxite and coal, for export to China, South Korea and India. Additionally, nickel, uranium, zinc, diamonds and copper figured in the export manifests. Australia's export success stemmed from an ability, partly founded on knowledge growth, to supply minerals to world markets at competitive prices.

Beyond the quarrying sector, farming expanded throughout the 20th century and natural resources became an essential ingredient in supplying tourism services. Over the 20th century the growth of land in use was greatly outpaced by the rise in population. There was no abrupt end to the extensive margin of cultivation, but the growth of farm output rested chiefly on higher land productivity, and thus on investment and new technology. Wheat output increased 10 times and wool production four times during 1890–1980, as biological and machine technology improved (Vamplew 1987, pp. 79–82). The restoration of rural prosperity during World War 2 and the 1950s, on the back of higher commodity prices, helped lift Australia's average income-growth rates above the pre-1890 trend, but there were more important, wider forces. Electrification, the petrol engine, paved roads, and chemical, biological and electronic technology stimulated productivity growth rates in manufacturing and services, as well as the rural economy after 1945. Technological progress was more important for Australia's longer-term prosperity than the temporary terms of trade upturn of the early 1950s.

Since the 1950s the farm sector's share of GDP has fallen sharply from around 20 per cent to 2 per cent in 2010 (see Figure 2.3 in Madsen, this volume). Manufacturing value added overtook that of farming in the 1950s. Iron, steel and engineering led industrial growth and utilised domestic coal and iron ore, but the importance of these industries diminished from the 1960s as protectionism waned. Thereafter, the rise of the service sector was powerful, but tempered by the faster growth of mining and natural gas extraction, most especially in Western Australia and Queensland. After an interlude of nearly 60 years, minerals returned to the centre stage of Australia's economic development. Some stimulus was given to energy-intensive industries in Australia, including aluminium smelting, but Asian markets have been the prime destinations of most natural resources. By 2009 minerals provided 55 per cent of Australia's exports. Much like wool or gold in earlier eras, minerals today dominate Australia's exports. Inevitably, historians' debates surrounding the earlier natural resource booms and busts have resonance in the modern discussions.

The lessons of the 19th century highlight the importance of investing transitory resource rents wisely. Contemporary analysts often stress the immediate

disruptions from resource booms – for example, to shepherding costs during the 1850s gold rush or to manufacturing competitiveness following the surge of iron ore exports in the 1960s. The immediate dislocations surrounding resource booms – to labour markets, inflation or exchange rates – may temper or disguise the benefits of resource exports. In the longer term the linkages to domestic industries and the effective utilisation of the natural resource rents are the key issues. A notable feature of the post-1960s minerals resurgence has been its high capital and knowledge intensity. Mining investment reached 4 per cent of GDP in 2009, around twice the ratio of the early-20th-century mineral boom. The substantial demands placed on the supplying industries encouraged knowledge creation and spillovers (Ville & Wicken 2013). Mining rents averaged above 6 per cent of GDP in the period 1990–2011, providing a substantial windfall to current incomes from the extraction of non-renewable resources.

Another feature of the current mining boom is its longevity: extracted mining rents have exceeded 5 per cent of GDP for 25 years since 1988 (Figure 7.1). In contrast, the early-20th-century mining boom realised rents above 5 per cent of GDP for 10 years, and the post-1851 gold rush for 13 years. Sustained investment in exploration and improved extraction technology have countered depletion to extend the period over which the resource rents can be consumed. Australia's high share of proven world mineral reserves, and its relatively small population, gives ground for optimism that the boon of mineral rents may persist, possibly for generations. For 14 major minerals Australia's economically demonstrated reserves rank first or second in the world (ABS 2012i). The variety of minerals in Australia, and the fact that new discoveries of many minerals are outpacing the extraction rates, adds to the possibility that mining can provide a foundation for longer-term prosperity. Alternatively, Australia's rates of net national investment and genuine savings serve to temper the lustre of the minerals boom.

In theory, the depletion of non-renewable resources needs to be offset by capital formation to maintain intergenerational wellbeing. The record of Australia's economic development highlights its success in utilising or extracting natural resources. Less clear-cut is the achievement surrounding the utilisation of the resource rents. The extended phase of low intensive growth from 1890, in the wake of the long resource boom of the previous 70 years, created lasting doubts as to whether or not the natural resource industries are a route to sustained economic development. Yet, by the 1960s, the earlier, pre-1890 trajectory of Australia's average income growth was surpassed. Higher trend growth was underpinned by an upswing in investment from

the 1930s to the early 1980s, when net domestic and net national investment rose to around 15 per cent and 10 per cent of GDP respectively (Figure 7.2). Genuine savings, supported by increases in public education investment, also rose strongly to 1980. After 1980 net investment ratios diminished and mineral depletion rose, to the extent that green investment was negative during 1991–2005, and genuine saving fell to around 1 per cent of GDP in the early 1990s (Figure 7.3).

The low rates of national savings during the 1990s have similarities with the experiences of the 1890s when green investment was negative for several years, with long-term adverse consequences for incomes growth. There are differences, however – most especially the fact that the investment in public education during the 1990s kept genuine savings positive, despite the depletion of non-renewable resources. Further, capital deepening has occurred in the Australian economy since 1992, with sustained increases in domestic and national investment ratios. The genuine saving ratio has averaged above 5 per cent of GDP since 2005, to match the long-run 1861–2010 ratio. Policymakers today are aware that the prosperity of future generations rests on the reinvestment of resource rents. The establishment of nation-building wealth funds in 2008 to support investment in infrastructure, health and education provides one illustration of that awareness. It is unlikely that enough has been done thus far to guarantee future wellbeing, given the uncertainties surrounding the markets for natural resources, and the limited size of Australia's nation-building funds, compared to the sovereign wealth funds of some oil-rich states. There are, however, grounds for believing that the natural resource industries, by judicious investment in exploration and extraction, and by the careful husbandry of the resource rents, can provide a pathway to sustained prosperity.

Labour, skills and migration

ANDREW SELTZER

Introduction

The 19th-century Australian labour market was defined more than anything else by the issue of labour scarcity. At the turn of the century, Australia had one of the largest landmasses in the world and yet one of the smallest populations. Table 8.1 shows the Australian population over the 19th century, expressed in absolute numbers and as a percentage of the population of the United Kingdom, United States and Canada. It can be seen that Australia was much more sparsely populated throughout the 19th century. This labour scarcity resulted in high wages relative to other countries and contributed to the (oft-disputed) notion of Australia as a 'workingman's paradise'. According to data compiled by Angus Maddison, Australia (along with New Zealand) was the richest country in the world in the late 19th century (Maddison 2010b).

This chapter examines the implications of scarcity for the Australian labour market from the later years of the convict period through to Federation in 1901. The chapter begins by examining free migration to the colonies. Despite relatively high wages, early 19th-century free migration remained relatively low, largely because of the cost of migration. Although migrants were increasingly attracted to Australia because of the gold rushes, the colonies nevertheless needed to implement extensive subsidies to attract suitable immigrants. There remains an ongoing debate as to the contribution of migration to 19th-century Australian economic growth and whether increased migration towards the end of the century resulted in wage convergence with the United Kingdom. Next, the chapter examines wages and skills. From the mid 19th century, Australian wages were high relative to virtually everywhere else. Although the majority of Australian workers had little employment security, a sizable minority, particularly in the tertiary sector, worked for employers with well-developed internal labour markets. Finally, this chapter examines labour market regulation and union activity. Unions were relatively small and inactive

Table 8.1 Non-Indigenous Australian population, 1811–1901

	Australian population ('000)	% of USA	% of UK	% of Canada
1811	11.9	0.16	0.06	
1821	35.4	0.37	0.17	
1831	76.0	0.59	0.31	
1841	221.0	1.29	0.82	
1851	437.7	1.89	1.59	18.24
1861	1168.1	3.72	4.02	
1871	1700.9	4.41	5.38	45.97
1881	2306.7	4.60	6.59	48.06
1891	3241.0	5.15	8.56	
1901	3824.9	5.02	9.19	

Notes: United States figures for 1810, 1820, etc. Numbers for the Aboriginal population, which outnumbered Australians of European descent prior to the 1830s, are not included because Aboriginal people were never a significant part of the formal labour market.

Sources: Australia, Vamplew (1987), p. 288; Canada, Statistics Canada; United Kingdom, Feinstein (1972), Table 55; United States, Carter et al. (2006), Table A2.

until the passage of legislation protecting their strike funds in the 1870s and 1880s. From 1890, there was a large increase in strike activity, although the major strikes of the decade ended in comprehensive defeat for the unions. For much of the 19th century, labour legislation was minimal. Although fledgling efforts at regulation began in 1873, universal binding factory legislation only came about after the defeated strikes of the 1890s motivated the colonial governments to turn to regulation as a means of keeping industrial peace.

One aspect of the coverage of this chapter deserves further comment. Virtually all of the existing economic literature on 19th-century labour markets concerns non-Aboriginal labour, and, by necessity, this chapter has followed suit. In part, the absence of Aboriginal labour in the historiography results from a lack of good data. However, in part, it also results from the marginalisation of the Aboriginal workforce and its concentration in rural areas of northern Australia (Hunter, this volume). Here, Aboriginal men played an important role in the development of the primary sector, and were widely employed in mining; marine industry, such as pearl diving; and farming, particularly pastoral work, mainly as cattle hands (Keen 2010b, pp. 2, 10; Lloyd 2010, p. 32). Aboriginal women were widely employed as domestic help (Keen 2010b, p. 3). The Aboriginal population only became an important source of labour in the settler economy from the mid 19th century, after the

end of the convict era and gold discoveries resulted in a scarcity of European labour (Lloyd 2010, p. 23). Although the importance of Aboriginal labour in the development of rural northern Australia is not disputed, there are few statistics on the Aboriginal labour market, which tended to be informal and seasonal and wages were often paid in kind (Keen 2010b, p. 2; Lloyd 2010, p. 32). Towards the end of the 19th century, there emerged a growing body of regulation concerning Aboriginal labour, and this is briefly reviewed in the penultimate section of the chapter.

Immigration

By the mid 19th century, labour supply problems had become a major bottleneck in the economic development of the colonies. In addition to the shortage in sheer numbers shown in Table 8.1, the colonies faced a lack of suitably skilled workers. Populating the colonies by transporting convicts also created an extreme gender imbalance, as convicts were overwhelmingly male (Meredith & Oxley, this volume). Table 8.2 shows the gender ratio for the entire population over the period 1828–1901 and working-age adults (ages 15–60) over the period 1861–1901. This gender imbalance impeded economic development by creating a barrier to natural population increase. The solution to these problems was populating the colonies through immigration.

Over the period 1851–1860, gross migration to Australia numbered 602 200 individuals, approximately 93 per cent of the 1851 population. Between 1861 and 1901 net migration totalled another 768 948 (Vamplew 1987, p. 6). Approximately half of all immigrants between 1831 and 1900 received some

Table 8.2 Gender ratios (men per one woman), 1828–1901

Year	Total population	Age 15–59
1828	3.20	n/a
1841	2.00	n/a
1851	1.40	n/a
1861	1.36	1.61
1871	1.20	1.34
1881	1.17	1.26
1891	1.13	1.18
1901	1.10	1.13

Sources: Alford (1984), p. 15; Vamplew (1987), p. 30.

Table 8.3 Birthplaces of Australian residents, 1861–1901

Birthplace	1861	1871	1881	1891	1901
Australia	37.23	53.49	63.22	68.24	77.22
British Isles	54.69	40.87	30.96	26.13	18.17
Other Europe	3.55	2.81	2.70	2.55	1.99
New Zealand and Americas	0.73	0.60	0.77	1.19	1.02
China	3.36	1.72	1.71	1.14	0.79
South Pacific (excl. NZ)	0.009	0.18	0.32	0.33	0.27
Other	0.42	0.31	0.32	0.42	0.54

Source: Vamplew (1987), pp. 8–9.

form of government assistance to come to Australia. Ethnically, migrants overwhelmingly were European. While precise figures on the country of origin are not easy to obtain, the census provides data on the country of birth of Australian residents. This is shown in Table 8.3. It is likely that the ethnic background of the Australian-born and New Zealand-born was fairly close to that of immigrants, implying that individuals of European ancestry comprised well over 90 per cent of non-Aboriginal Australians throughout the century.

Despite the importance of migration for Australian growth implied by the figures above, free migration was slow to redress the problems of population and skill shortage. As of 1830, a total of only 15700 free migrants had come to Australia since the first settlement (Vamplew 1987, p. 4). In the early 19th century, Australia was unattractive to many potential migrants because of its high cost. In part, this was due to the upfront costs of transport. A steerage-class ticket from England to Australia typically cost as much as £30 before about 1830, declining to about £12–£15 later in the century as a result of economies of scale brought about by the assisted migrant program (McDonald & Shlomowitz 1991, pp. 196–8). Even the lower end of these figures was about the same as a typical annual income for an unskilled British labourer and several times the cost of a ticket from England to the United States (Baines 1986, p. 86; Butlin 1994, p. 19). Part of this cost disadvantage was due to the tyranny of distance. In addition, steerage space was much more readily available in voyages to the United States than to Australia, as there was far less return freight from the United States to the United Kingdom than in the reverse direction (McDonald & Shlomowitz 1991, p. 199). Because space in the cargo decks could be used for steerage-class passenger transport at little extra cost, steerage fares to the United States were often as low as £2. A related problem

was that the lower cost of transport meant that return migration was a more viable prospect from the United States than was the case with Australia. This meant that, in addition to being more costly, migrating to Australia was more risky than migrating to the United States, as migrants had few prospects of returning.

In addition to the high upfront cost of passage, migrants to Australia faced comparatively high post-arrival costs. One of the most important costs facing migrants was the cost of adjusting to changed circumstances. The literature on migration has emphasised the importance of networks in the destination country in determining these costs (Butlin 1994, p. 19; Hatton & Williamson 1998). Put simply, new migrants often relied on friends or family who had previously emigrated to help pay for their own passage. Upon arrival, migrants typically learnt about their new environment and often acquired jobs through personal contacts developed in their country of origin. These networks created a path dependency in migration; a country with a large number of migrants would have larger social networks available to new migrants, and thus have lower adjustment costs. In this respect, the United States was a lower-cost destination than Australia, as there were large successive waves of migrations from the early 19th century.

Because relatively few free migrants came to the colonies during the early years of settlement, many of the colonial governments established programs to assist immigrants with the cost of passage, beginning with an 1831 New South Wales program that used revenues from land sales to pay for passage. Assisted migrants often paid nothing for passage, although they typically had to pay £1–£4 in associated costs (Haines 1994, p. 228). Eligibility for assistance was determined by character, health, age, occupation, and family membership (Haines 1994, p. 227). Assisted migrants were more likely than convicts or free migrants to possess skills that could be used in the primary sector. Haines (1994) estimates that about half of adult male assisted migrants to New South Wales and Victoria between 1848 and 1860 possessed agricultural skills (Haines 1994, p. 231). Assisted migration also was an important mechanism for increasing the female population. Women outnumbered men by over 15 per cent among assisted migrants to New South Wales between 1832 and 1850 (35 332 versus 30 113), but were outnumbered among unassisted migrants by a factor of more than two over the same period (7122 versus 14 428) (Butlin 1994, p. 28).

Haines and Shlomowitz (1991) estimate that about 47 per cent of all free immigrants from the United Kingdom between 1821 and 1900 received some form of assistance. However, there are two important caveats to this

figure. First, there was considerable variation across states and time. After gold discoveries in Victoria, government assistance became less necessary to attract migrants. The proportion of immigrants to Victoria receiving government assistance dropped from 73 per cent in 1846–50 to 33 per cent in 1851–5 (Haines & Shlomowitz 1991, p. 52). On the other hand, a substantial majority of immigrants still received government assistance to migrate to Western Australia until the late 1860s, to New South Wales until the mid-1870s, to South Australia until the late 1870s, and to Queensland into the 1880s. Second, as migration was often a joint decision within families and in many cases some, but not all, family members may have been eligible for subsidies, the number of migrants affected by subsidies was probably somewhat larger than the number directly receiving assistance (Haines & Shlomowitz 1991, p. 59).

While state assistance was probably the biggest factor in increased migration after 1830, two additional factors were also important contributors. First, beginning in 1848, the gold rushes attracted miners from England, Scotland, Ireland, China and elsewhere. The impact of the Victorian gold rush on immigration is evident from population statistics. The population of Victoria grew from 77 345 (approximately 18 per cent of the Australian total) in 1851 to 538 628 (approximately 47 per cent of the Australian total) in 1861 (Vamplew 1987, p. 30). The 1871 population of the 36 major gold mining cities and towns was about 145 000, almost as much as the population of Melbourne (Fahey 2010, p. 159). While some of the Victorian population boom was a result of internal migration from elsewhere in Australia, about 65 per cent of the total Australian population growth over the decade occurred in Victoria (Vamplew 1987, p. 30). The second important factor was the 'long boom' of 1860–89. Standard immigration models emphasise relative employment opportunities and wages in the country of origin and destination as being perhaps the most important factor in the migration decision (Hatton & Williamson 1998, pp. 32–52; Pope & Withers 1993, pp. 730–1). Figure 8.1 shows there existed a strong relationship between the business cycle and net immigration. Net migration reached its 19th-century peak during the 30 years of the long boom, followed by a near complete collapse in the depression of the 1890s. Pope and Withers (1993) have examined the cyclicity of late 19th-century migration using a multiple-equation econometric model, and confirm that it was strongly pro-cyclical.

As shown in Table 8.3, the overwhelming majority of 19th-century migrants to Australia were of European ancestry. However, it was the two sizable non-European migrant groups, the Chinese and Pacific Islanders, whose presence had the most impact on late 19th- and early 20th-century migration legislation.

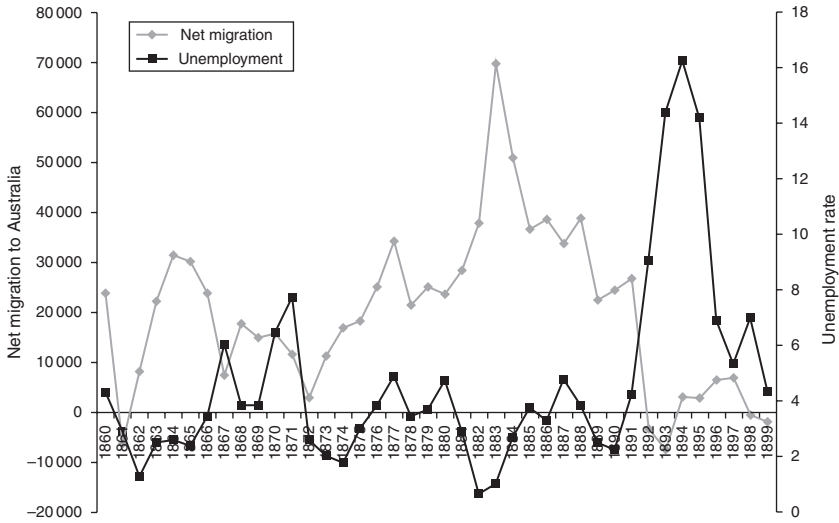


Figure 8.1 Net migration to Australia and the unemployment rate, 1860–99

Note: The unemployment rate is for members of the Amalgamated Society of Engineers.

Source: Vamplew (1987), pp. 6, 153.

The Chinese first came to Victoria in large numbers to work the goldfields from 1853 (Coghlan 1918, p. 615). By 1856, Chinese miners comprised approximately one-quarter of those working the Bendigo goldfields, and by 1857 the Chinese population of Victoria numbered 25370 (Fahey 2010, p. 153; Coghlan 1918, p. 615). In addition to working in the gold mines, Chinese workers were concentrated in a handful of industries. Census returns from 1891 show that Chinese workers comprised more than 25 per cent of the workforce in 16 trades, including launderers, cooks, ship hands, cabinet makers, storekeepers and vegetable growers (Coghlan 1918, pp. 1131, 2318).

From the 1860s, Pacific Islanders were brought to northern Queensland as indentured servants to work in the sugar industry. Between 1869 and 1890, the industry's annual output grew from 1490 tons to 68924 tons, and the region suffered from an acute shortage of labour (Graves 1993, p. 221). Pacific Islanders were far cheaper than alternative sources of labour, both because of the proximity of their homelands to northern Queensland and their relative poverty at home meant that they were willing to enter indenture contracts at lower wages than other groups. Between 1863 and 1906, over 60000 Pacific Islanders migrated to Queensland (Graves 1993, p. 1). In 1888

there were 5298 Pacific Islanders working in the Queensland sugar industry, approximately 63.7 per cent of the industry's workforce (Graves 1993, p. 40). However, Pacific Islanders never comprised a large portion of the Australian population (Table 8.3) as few women migrated, they faced high mortality rates in tropical Queensland and the majority returned home at the end of their contracts.

Non-white groups comprised a very small proportion of the Australian population throughout the 19th century. Pacific Islanders comprised less than 2 per cent of the Queensland population in 1891, and their numbers were negligible in the other colonies (Graves 1993, p. 147). The Chinese were more numerous, comprising 10 per cent of the adult male population of Australia in 1861, 6 per cent in 1871 and 2 per cent in 1891 (Coghlan 1918b, pp. 1334, 2318). Although the number of non-white immigrants remained small throughout the 19th century, their presence sparked a nativist movement. The disproportionate alarm caused by non-European migration can be ascribed to three separate factors. First, the tyranny of distance and relative proximity to Asia made it difficult to maintain a European identity without immigration restrictions. Secondly, racist attitudes towards non-Europeans were widespread throughout the colonies. For example, the Chinese were widely viewed as being prone to engaging in immoral activities, such as gambling and opium smoking (Coghlan 1918b, p. 2318). Finally, white Australians feared economic competition from non-white workers. Chinese workers were viewed as being industrious and were paid less than 40 per cent of the European rate in some industries (Coghlan 1918b, p. 2318).

The nativist movement was successful at persuading colonial parliaments and later the federal parliament to enact laws restricting immigration and opportunities in Australia for non-whites. The most important legislation covering Pacific Islanders were the 1884 and 1901 *Pacific Island Labour Acts*. The 1884 Act banned importation of Pacific Islander labour from 1885 (later overturned in 1892) and restricted Pacific Islanders to working as unskilled labour in 'tropical industrial agriculture', effectively removing them from sugar mills, maritime industries and pastoral industries (Graves 1993, pp. 57–62). The 1901 Act went further, banning importation of Pacific Islanders from 1904 and repatriating the majority of them by 1907. The first anti-Chinese legislation was passed in Victoria in 1854 at the behest of gold miners who feared competition. Numerous anti-Chinese laws were introduced from the late 1870s, including Queensland legislation that threatened to discontinue subsidies paid to shipping companies that employed Chinese labour; New South Wales and Northern Territory legislation that required

new Chinese immigrants to pay a £10 poll tax; New South Wales legislation that prevented most Chinese immigration and prohibited Chinese workers from entering certain occupations; and West Australian legislation prohibiting the indenture of Chinese labour in tropical districts (Coghlan 1918b, pp. 1331–45). The most far-reaching immigration legislation was the federal *Immigration Restriction Act 1901*. The Act contained provisions about who could enter Australia and mandated fines for ships' captains and owners for transporting illegal immigrants. However, the most important provision of the Act was the creation of the dictation test, which could be given in any European language. While the dictation test was not explicitly racial, in practice it meant that immigration officers could restrict entry to whites only. The Act remained an integral part of the 'White Australia' policy until 1973.

A final important set of questions addressed in the migration literature has concerned the impact of migration on the Australian economy. The impact of migrants on the native-born is theoretically ambiguous. Migrants may be substitutes in production for the native-born, in effect playing the same role in the Australian labour market. This effect implies that increasing migration should lower native wages or increase unemployment. On the other hand, migrants may bring with them capital and demand for goods, creating new demand for labour. This effect implies that migration would increase native wages and employment. Withers (1977) estimates the derived demand effects of migration to be large, although he does not address issues relating to the labour supply. Pope and Withers (1993) use a multiple-equation regression model to examine the causal effect of immigration on Australian wages and unemployment between 1861 and 1901. They find that the two effects described above were largely offsetting and thus immigration had almost no net effect on native unemployment or wages. Pope and Withers confirm the result that migration had little net effect on the average wage level. They also find that the skill premium varied inversely with the ratio of skilled to unskilled migrant arrivals from the United Kingdom, and thus migration played an important role in Australia's comparatively high unskilled wages (Pope & Withers 1994, p. 260).

The impact of migration on wages has also been addressed in a literature examining wage convergence between Europe and the new world. The fundamental assumption of the convergence model is that migration reallocates workers from labour-rich countries to labour-scarce countries. In so doing, it decreases the supply of labour and thus increases wages in the source countries and does the reverse for destination countries. Over time, the wage gap between the source and destination countries will decline, although the

extent of this decline will be constrained by productivity differences and the cost of migration. The evidence on convergence is mixed and depends on what is being measured. Pope and Withers (1994) argue that the mean Britain–Australia real-wage gap did not converge towards zero in the period prior to 1900. On the other hand, O’Rourke, Taylor and Williamson (1996) argue that there was strong convergence in the wage–rental ratio between New World and Old World countries over the same period.

Wages and skills

Nineteenth-century Australia was viewed by many contemporaries as a ‘workingman’s paradise’ with high wages and comparatively good working conditions (Coghlan 1918b, pp. 1239–40). Most subsequent economic historians have shared this view (e.g. Allen 1994; Macarthy 1971). The available statistics generally support their argument. Australia had among the very highest levels of per capita GDP in the world throughout the second half of the 19th century (Maddison 2010). Figure 8.2 shows that real

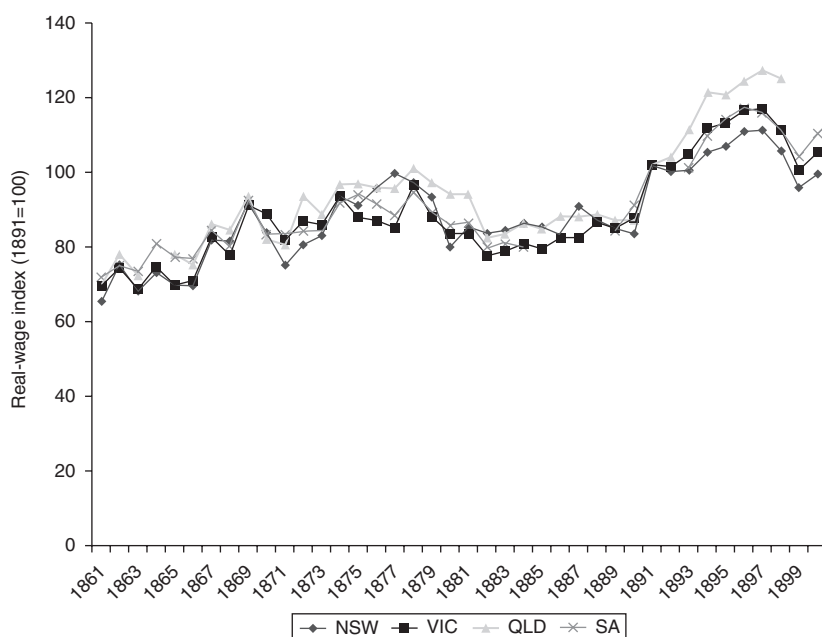


Figure 8.2 Real-wage indexes, 1861–1900

Source: Vamplew (1987), p. 154.

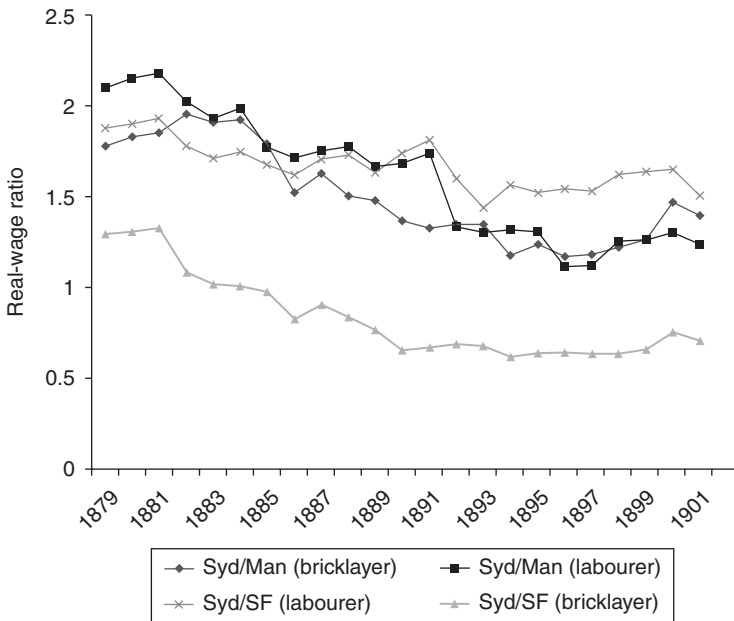


Figure 8.3 Real wages in Sydney relative to Manchester and San Francisco, 1879–1901

Note: Real wages are calculated in 1896 Manchester pounds per day.

Source: Allen (1994), pp. 129–30.

wages were generally increasing between 1861 and 1900. Robert Allen has constructed comparable real-wage series for Australia and other English-speaking counties for the period 1879–1901 (Allen 1994). Figure 8.3 shows relative wages for Sydney compared with Manchester and San Francisco, for two well-defined occupations, labourers and bricklayers. The international comparisons highlight the relatively privileged position of the Australian working class, particularly unskilled workers. Unskilled labourers were better paid in Sydney than in either Manchester or San Francisco. The picture for bricklayers is mixed, with workers in Sydney earning more than their counterparts in Manchester, but less than in San Francisco. Allen's data can also be used to estimate a skill premium, and this is shown in Figure 8.4. The skill premium in Sydney was about the same as in Manchester and far lower than in San Francisco.

Although most early commentators were of the view that the Australian working classes were among the most prosperous of the time, others noted the existence of long hours and poor working conditions in the

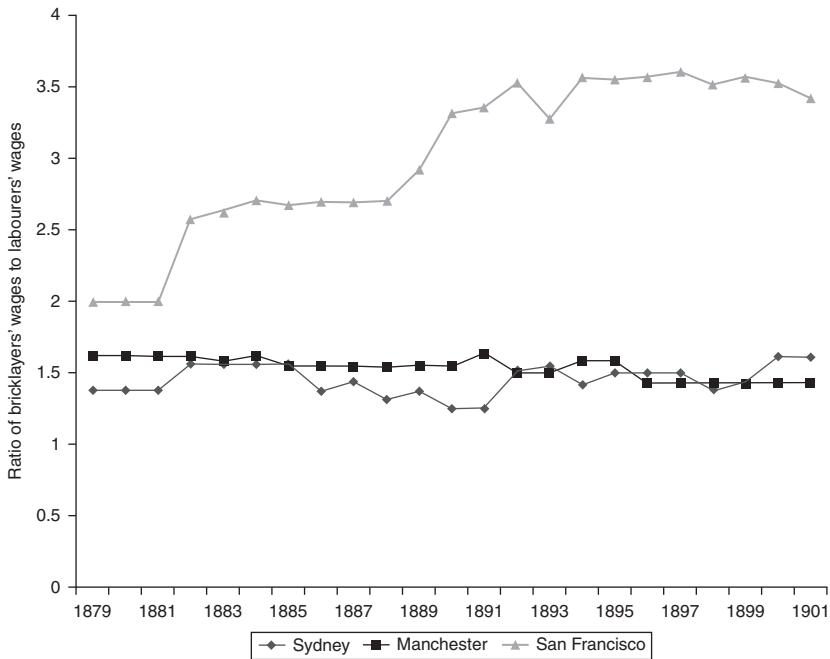


Figure 8.4 Skill premiums in Manchester, Sydney and San Francisco, 1879–1901

Source: Allen (1994), pp. 129–30.

newly emerged manufacturing industries of Sydney, Melbourne and, to a lesser extent, the other capital cities (Coghlan 1918, pp. 2087–8; Hagan 1964, pp. 3, 5; Lee & Fahey 1986, pp. 1–2). These complaints began with the rise of the manufacturing sector in the late 1850s and increased with its growth over the remainder of the century. The very term ‘workingman’s paradise’ comes from the 1892 William Lane ‘socialist novel’ based on the premise that Australia was far from being the embodiment of the title. More recently, labour historians have incorporated many of these arguments into a pessimistic view of working-class lives in 19th-century Australia. Lee and Fahey (1986) argue that throughout the long boom, workers’ attachment to their jobs remained low, casual labour was common and much employment was highly seasonal. Fitzgerald (1987) argues that the proportion of workers in unskilled jobs rose during the long boom, casual work and unemployment were commonplace, and there was a lack of social mobility. In addition, she argues that for a large proportion of Sydney’s population, economic conditions were worsening during the period 1870–90.

The claims of the pessimists are difficult to reconcile with the wage data shown in Figure 8.2. Fitzgerald has provided two responses to this observation. First, Figure 8.2 only shows average real wages. She argues that workers at the lower end of the wage distribution may well have experienced deteriorating wages while others experienced increasing wages. Second, the data shown in Figures 8.2, 8.3 and 8.4 was collected from colonial Statistical Registers. These data have been criticised as imprecise, often showing little year-to-year variation and only providing a range of wages (Macarthy 1971). Fitzgerald (1987) also claims that the official wage rates often reflected the aspirations of the union, rather than the reality of the workplace. However, all available data, including those from sources other than the Statistical Registers, point towards wage increases over the long boom and to a relatively stable and comparatively well-off position for unskilled workers. Fahour and Withers (1992) found a high correlation over time between wages reported in the Statistical Registers and in job advertisements in the *Sydney Morning Herald*. Fahey and Sammartino (2013) find that average wages at Guest Biscuit were increasing over this period. Macarthy (1971) finds that the skill premium was relatively stable after 1890. In addition, the optimists have pointed out the relatively favourable position of unskilled Australian workers compared to their counterparts elsewhere. Macarthy (1971) argues that the defining characteristic of the late 19th-century Australia labour market was that 'rewards for unskilled and semi-skilled work were extraordinarily high ... [perhaps] twice as much as was paid for similar work in Britain' (Macarthy 1971, p. 57). Similarly, Allen (1994) concedes that most employment was insecure, but argues that this was true of all advanced economies in the 19th century and that there is no evidence to suggest that this might have been worse in Australia. Other evidence shows that Australia probably had the shortest working week in the world in the late 19th century (Huberman & Minns 2007, p. 542).

Although most of the 19th century Australian labour market effectively was a spot market, by mid century a small but growing share of elite employers, such as banks, the railways, the Civil Service and some of the manufacturing sector, operated internal labour markets (Fahey & Sammartino 2013; Sammartino 2002; Seltzer 2010; Seltzer & Merrett 2000; Seltzer & Sammartino 2009, 2011; Seltzer & Simons 2001). Some of the characteristics of employment in these workplaces included the following. New appointees were typically young, often school leavers. Workplace skills were learnt through on-the-job training rather than formal education. There existed well-defined career ladders, and higher-level appointments were typically filled by promotion rather

than by external hiring. Few employees moved between employers in the same industry. There was often a long-term attachment between employers and employees, and many employees remained with a single employer over their entire careers. Tenure, as well as ability, played an important role in promotion decisions. Pay was characterised by a set of impersonal rules, emphasising the importance of tenure and promotion, rather than by managerial discretion. Finally, pay of incumbent employees, but not new entrants, was shielded from the external labour market, and there were almost no year-to-year nominal pay cuts, even during periods of severe deflation.

Analysing the nature of internal labour markets requires laborious collection of a large volume of firm-level data, and consequently the available evidence is largely based on case studies of a handful of firms. Andrew Seltzer has studied internal labour markets in banking, primarily using data from the Union Bank of Australia (Seltzer 2010; Seltzer & Merrett 2000; Seltzer & Sammartino 2011; Seltzer & Simons 2001). There is considerable evidence that the practices described were universal throughout the banking sector. There is more limited evidence available for other white-collar employers, but the available evidence suggests that these practices were also fairly widespread for the 'clerical aristocracy' in insurance and the Civil Service (Seltzer & Merrett 2000, pp. 578–9). Personnel practices at the railways were more complex, as the different divisions had their own internal labour markets (Sammartino 2002). Long-term employment occurred throughout the railways; however, departments varied considerably on the extent to which the other practices described above were implemented. It can be said, however, that virtually all railways employees had well-defined career tracks and received some returns to both tenure and promotion.

Figure 8.5 shows two of the most important aspects of internal labour markets at the Union Bank of Australia and the Traffic Branch of the Victorian Railways, namely the returns to tenure and promotion. Although it is evident that both organisations tied pay to both tenure and position, there are two striking differences between their practices. First, the returns to tenure were much higher at the Union Bank. The initial salary at the two organisations was fairly similar, but a long-serving employee of the Union Bank would typically earn over twice as much as an otherwise similar employee of the Victorian Railways. Second, the returns to promotion were potentially much higher at the Union Bank because a junior could rise further up the hierarchy. A talented junior bank clerk might be promoted five or six times during his career, whereas a talented porter could be promoted at most twice.

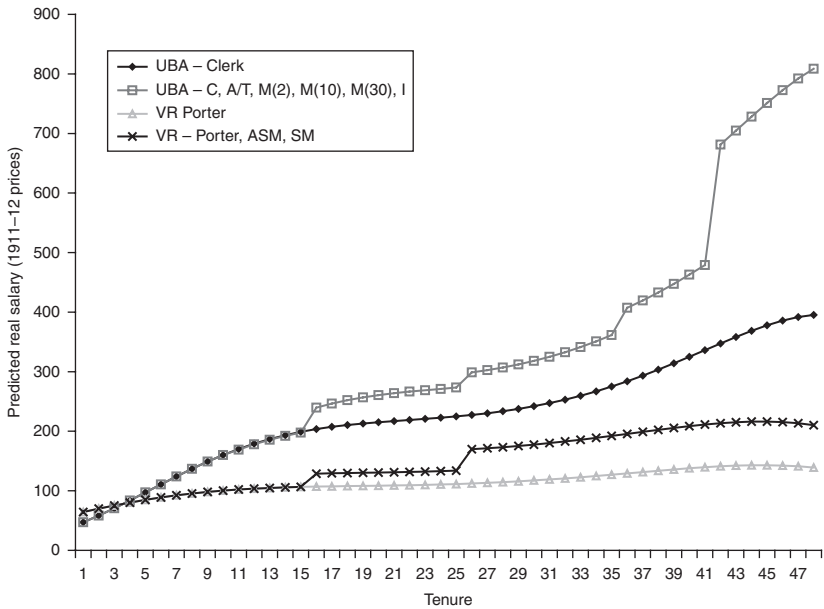


Figure 8.5 Returns to tenure and promotion at the Union Bank of Australia and Victorian Railways

Notes: The predicted salaries are based on a regression of log earnings on a vector of worker characteristics. See Seltzer and Sammartino (2009, pp. 122–3) for a description of the regressions. The series UBA – Clerk shows the profile of a career clerk at the UBA; the series UBA – C, A/T, M(2), M(10), M(30), I shows the profile of a clerk who worked their way up to accountant/teller, manager (successively of branches with 2, 10 and 30 staff) and inspector; the series VR – Porter shows the profile of a career porter at the VR; and the series VR – Porter, ASM, SM shows the profile of a porter who worked their way up to assistant station master and station master.

Source: Seltzer & Sammartino (2009), p. 124.

Unquestionably, the Union Bank and Victorian Railways were atypical employers and it remains an open question as to whether their employment practices were widespread. The available evidence on this suggests that, although by the end of the 19th century there existed a large and growing number of employers that were big enough to support internal labour markets, larger private-sector employers probably had weaker internal labour markets than either the banks or the railways. Fahey and Sammartino (2013) provide the only comprehensive account of employment practices based on employee record books at a manufacturing firm (Guest Biscuits). They find that average tenure at Guest was considerably shorter than at the Union Bank

or Victorian Railways, but nevertheless was longer than might be expected from a pure spot labour market. Similarly, there were substantial returns to tenure at Guest, although not as large as in banking.

One reason that Australia maintained comparatively high wages throughout the 19th century was its relatively high level of human capital. The Australian colonies were among the international leaders in primary education. Primary education in Australia dates back to 1792 and, during the early years of settlement, was supplied primarily by religious providers (ABS 1909a). Education became public through a series of Acts of parliament in New South Wales (1867), Victoria (1862), Queensland (1860), South Australia (1875), Western Australia (1871) and Tasmania (1863). Primary education became compulsory over the century, beginning in 1868 in Tasmania. Universities were established in Sydney (1850), Melbourne (1853), Adelaide (1874) and Hobart (1890) (ABS 1909b). Technical colleges were first established in Victoria in 1870 and New South Wales in 1883.

The early existence of educational institutions does not, by itself, demonstrate high levels of human capital. David Pope has argued that the distinguishing feature of Australian education was its near-universality (Pope 1989, p. 14). He argued that by the end of the 19th century, primary education was free and compulsory to all Australian children and that about 98 per cent of the New South Wales population could read and write. Pope also showed that between 1885 and 1901, education comprised about 5 per cent of total government spending, about the same as health and immigration combined (Pope 1989, pp. 11, 14).

Some comparative international statistics support the view that by the late 19th century, primary education was more widely available in Australia than virtually anywhere else. Figure 8.6 shows late 19th-century enrolment rates in several advanced countries for children aged 5–14. Even as early as 1860, Australian enrolment rates were well above those of Italy and only slightly below those of the European leaders (the United Kingdom and the Netherlands). By 1880, Australian enrolment rates surpassed all European countries and lagged only slightly behind the United States and Canada. Although primary enrolment rates were high in the 19th century, secondary and tertiary enrolment rates remained much lower than those of the United States or Canada well into the 20th century (Pope 1989, p. 14; MacKinnon 1989a, pp. 107–8).

A second important source of human capital was migration. Withers (1989) has constructed an index of the skill levels of migrants, and this is shown in Figure 8.7. It can be seen that in virtually every year between 1877 and 1901, a majority of immigrants fell into these categories: skilled

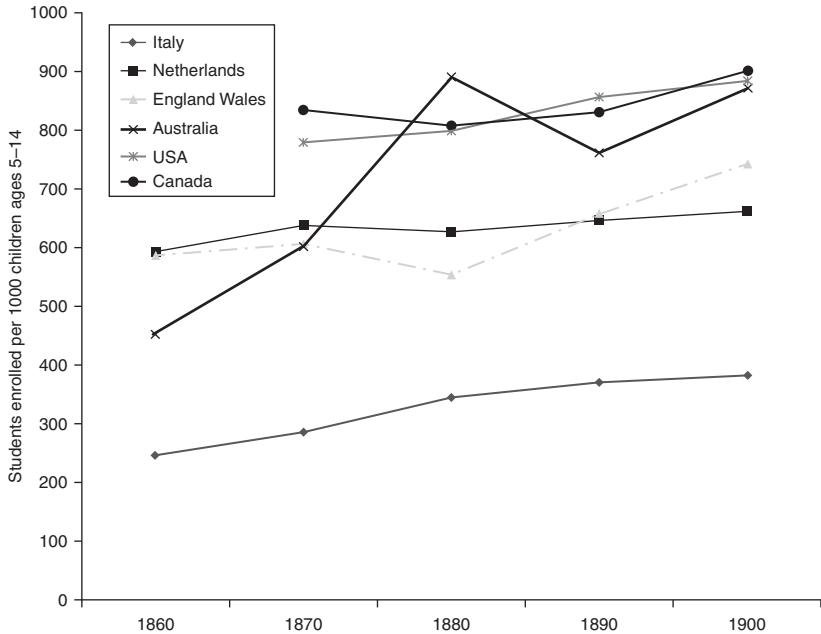


Figure 8.6 International student enrolment rates, 1860–1900

Note: Figures for USA are for public (state) schools only.

Source: Lindert (2004), pp. 91–3.

(professional, technical, and skilled trades), semi-skilled upper group (clerical, commercial, financial and administrative) or semi-skilled lower group (agricultural workers and industrial operatives). Although Withers does not provide any direct evidence about the skill distribution of the native-born, he does note that the skills of immigrants during this period were ‘relatively high’ (Withers 1989, p. 63).

Union and government intervention in labour markets

Although Australia would later become one of the first countries to depart from the laissez-faire approach to labour markets, prior to the 1870s there was little union activity or government legislation of the non-convict labour market. Apart from the immigration legislation discussed earlier in this chapter, the only government regulation covering most workers was a series of *Masters and Servants Acts*, beginning in New South Wales in 1823. These Acts

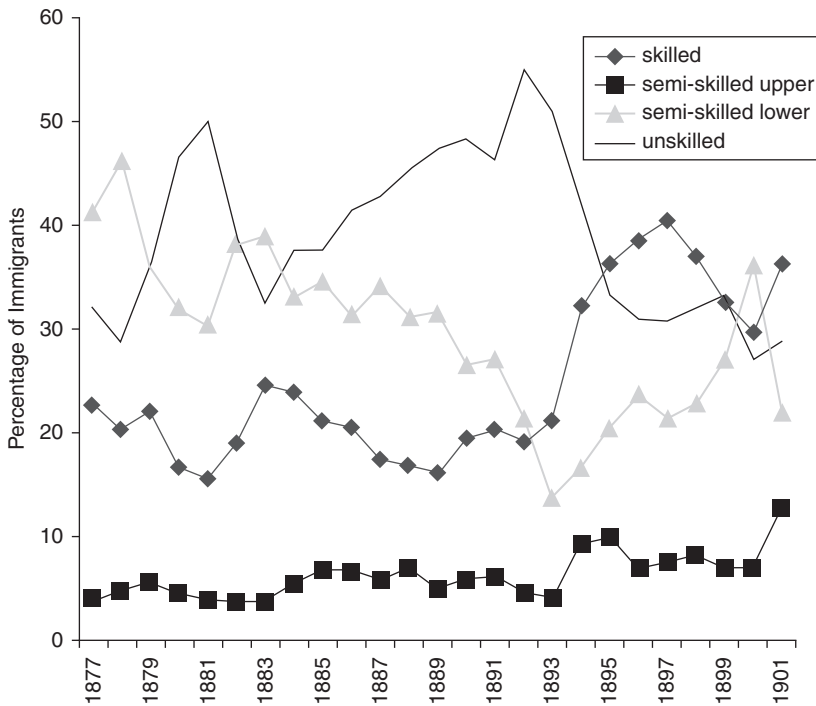


Figure 8.7 Skill level of immigrants, 1877–1901

Source: Withers (1989), pp. 59–60.

are generally viewed as having benefited employers, with the most important provisions pertaining to punishment for workers' absence (Quinlan 2004, pp. 220–30). The only other labour legislation concerned Aboriginal employment, such as an 1844 South Australian law regulating apprenticeship and work of Aboriginals; an 1873 West Australian law regulating Aboriginal employment in pearl shell fishing; and an 1886 West Australian law and an 1890 Victorian law regulating employment contracts and apprenticeships for Aboriginal people (Australasian Legal Information Institute 2013). Similarly, while trade unions date back to the 1830s, their activity was fairly limited during the first two-thirds of the 19th century (Sutcliffe 1921; Waters 1982). Full legalisation of union activity did not come until the 1870s.

The coincident timing of the expansion of both unions and government intervention in the 1870s was largely due to conditions created by economic expansion during the long boom. During this period, both productivity and output increased sharply in rural industries such as wool, wheat and meat

(Waters 1982, pp. 91–2). Manufacturing, which was very limited in 1861, grew even more rapidly. Manufacturing employment in both New South Wales and Victoria increased nearly fourfold between 1863 and 1875, and nearly doubled again between 1875 and 1889 (Vamplew 1987, p. 288). Real wages increased by a more modest 15–20 per cent over the period (Vamplew 1987, pp. 154, 160). Unemployment remained relatively low during this period (Figure 8.1).

While manufacturing workers in Australia fared reasonably well compared to their British cousins and the notion of a ‘workingman’s paradise’ undoubtedly did have an element of truth, the fruits of economic growth were not shared evenly. As factory employment grew from 1860, so too did complaints of ‘sweated’ labour, characterised by long hours of work, low pay, insufficient break time, use of home-work, and poor ventilation and lighting. Coghlan argued that in 1870 factories were often characterised by ‘a general disregard for cleanliness, a lack of sanitation, and, in many trades, an overworking of women and children’ (Coghlan 1918, p. 2087). These complaints were also taken up by contemporary newspapers such as the *Courier* in Ballarat and the *Age* in Melbourne (Hagan 1964, pp. 3, 5; Coghlan 1918, pp. 2087–8).

Organised efforts to improve working conditions began in earnest in the 1870s. Earlier trade unions were often little more than friendly societies, and their ability to call strikes was limited by the lack of legal protection for their strike funds. A series of *Trade Union Acts* passed in the colonies in the 1870s and 1880s gave unions full legal protection (Waters 1982, p. 98; Sutcliffe 1921, pp. 76–81). Union membership and strike activity increased markedly following the passage of these Acts. Waters estimates that by 1891 there were 124 colony-wide unions, with a total membership of approximately 55 000 (Waters 1982, p. 101). Many of the largest unions in 1890 only began in the 1870s or 1880s (Waters 1982, pp. 98–101). Between 1880 and 1887, there were 50 recorded industrial disputes in Sydney involving unions belonging to the Sydney Trades and Labour Council and numerous strikes by unions outside the council (Waters 1982, p. 101). The main issues surrounding these strikes were the establishment of an eight-hour day and cuts to wages.

Most strikes in the 1880s were small in size and lasted for only a short duration. Strike activity increased dramatically in both size and duration in the early 1890s. The Maritime Strike, which ran from August to November 1890, was by far the largest strike in the colonies to that date, with estimates putting the number of strikers between 25 000 and 50 000 (Waters 1982, p. 104). The primary issue of the strike was the right to a closed shop, although strikers also demanded higher wages (Coghlan 1918, pp. 1591–607; Sutcliffe 1921, pp. 92–7; Waters 1982, pp. 102–4). The strike was not limited to maritime workers, as

large numbers of miners and shearers were also called out by their unions. Although the strikers succeeded in slowing the shipyards, raising the price of coal and temporarily stopping the shearing, in the end the strike was comprehensively defeated. As a result of the depression, there were large numbers of non-union workers willing to take the place of the strikers. While these workers could not replace the most skilled union members, they were sufficient to prevent significant financial losses for the employers. A second important reason that the strike was defeated was government support for the employers, in particular the deployment of police to protect non-union workers and the prosecution of shearers under the *Masters and Servants Act* (Sutcliffe 1921, p. 96). By early November, the unions' strike funds were exhausted and the strikers returned on the employers' terms (Coghlan 1918, p. 1606; Sutcliffe 1921, p. 97; Waters 1982, pp. 104–5).

Over the next few years, large strikes were called by the shearers (1891 and 1894) and the miners (1892). As with the Maritime Strike, the main issues of these strikes were, first, the right to a closed shop, and second, opposition to wage cuts imposed by employers during the depression. The bargaining power of the unions would have been low during the depression in any case, but further intervention by the police made defeat inevitable. Each of these strikes failed to achieve their stated aims; and the employers were able to reduce wages and increase their employment of non-union labour. As a result, from the mid-1890s union membership dropped considerably (Sutcliffe 1921, p. 97; Waters 1982, pp. 104–6).

Beginning in the 1870s, Australia increasingly turned to legislation as a way of controlling labour markets. While the old industrial powers of Europe, such as the United Kingdom and Germany, enacted factory legislation much earlier, Australia would become (along with New Zealand) one of the first two countries to pass minimum wage legislation (Huberman & Meissner 2010, p. 660). Perhaps even more revealing is the comparison between Australia and other New World countries that began to industrialise at about the same time. Australia passed legislation permitting the inspection of factories, prohibiting child labour, banning women from working at night, setting a maximum workday of 11 hours, and establishing minimum wages prior to Argentina, Canada or the United States (Huberman & Meissner 2010, p. 660).

Legislative attempts to improve working conditions began with the Victorian *Factory Act* of 1873. The Act, which covered only factories employing at least 10 staff, prohibited employment of women for more than eight hours per day under most circumstances; banned employment of young

children; allowed inspectors to enter the workplace; and created a board that could regulate factories' warmth, cleanliness, and sanitary arrangements based on the recommendations of the inspectors (Hagan 1964, p. 4). It has been generally agreed that this Act had little effect, as there were relatively few inspectors and evasion (by reducing the establishment size or increasing the amount of work done at home) was widespread (Coghlan 1918, p. 2088; Reeves 1923, pp. 5–6). An 1885 amendment to the *Factory Act* required regular sanitary inspection and reduced the minimum establishment size to six employees (Reeves 1923, p. 18; Coghlan 1918, p. 2089). The 1885 Act also for the first time regulated work in shops. However, observers felt that this Act also failed to eliminate all aspects of sweating (Reeves 1923, p. 7).

As of 1890, only Victoria had a comprehensive law on the books, although from 1884 Tasmania had the more limited *Employment of Women and Children in Workrooms and Factories Act* (CBCS 1925). However, after the failure of the strikes of the 1890s, workers increasingly turned to legislation to advance their goals. Factory legislation and compulsory arbitration was seen as a means to gain the advances in working conditions, pay, and hours of work that the strikes had failed to achieve.

In 1894 South Australia passed the *Conciliation Act*, which covered all establishments with at least four employees. The Act prohibited almost all employment of children under 13, established a 48-hour week for women and children, created a range of health and safety rules, and established a system of inspection (Coghlan 1918, pp. 2090–1). The *Conciliation Act* also introduced the principle of compulsory arbitration, which later was incorporated into federal legislation. A similar Act followed two years later in New South Wales. The New South Wales Act also created time-and-a-half provisions for overtime work and covered all establishments, regardless of size, which employed any Chinese workers (Reeves 1923, pp. 43–4). The first inspector's report a year later highlighted that larger factories were generally clean, well ventilated and well lit; however, smaller factories frequently were not (Reeves 1923, p. 18). Queensland passed a similar law in 1896, but with weaker overtime restrictions (Coghlan 1918, p. 2090; Reeves 1923, p. 46). Western Australia and Tasmania also passed similar laws in 1897 and 1900 respectively (CBCS 1925).

However, Victoria, which had the largest manufacturing base, passed the most comprehensive labour laws in the late 19th century. An 1894 amendment to the existing *Factory Act* reduced the number of employees for an establishment to be considered a factory to four, prohibited employment of children under age 13, restricted employment of children aged 13–16, limited women

and children to working a maximum of 48 hours, and contained further health and safety provisions (Coghlan 1918, pp. 2090–1). However, it was the subsequent *Factories and Shops Act* of 1896 that brought about a major departure from previous legislation, and thus was perhaps the most important piece of labour legislation passed in the century. The law tightened the definition of a factory, but, more importantly, provided that ‘special boards’ could be appointed to set minimum wages and piece rates as well as regulating other conditions already covered under the *Factory Acts* (Coghlan 1918, pp. 2010–1; Reeves 1923, p. 53). The boards were initially limited to factories making clothing, shirts, underclothing, boots, furniture and baked goods, but a 1900 amendment essentially permitted regulation of any industry. The boards were to consist of between four and 10 members, half of whom were to be elected by the employers and half by employees (apart from the chairman, who would be neutral). Both the regulation of minimum wages and the creation of boards, which effectively had the power of compulsory arbitration, were marked departures from previous legislation, and provided the initial model for future federal legislation, such as the *Conciliation and Arbitration Act 1904*. An unintended consequence of the 1896 Act was to strengthen the unions, as their place at the bargaining table as the representative of the employees was effectively guaranteed by law (Coghlan 1918, p. 2113).

Table 8.4 reports summary statistics of employment and wages in 1900 for the six industries originally covered by the 1896 Act. The industries covered under the law were selected because they had a high number of female employees (boot, clothing, shirt and underclothing), they had a high number of Chinese workers (furniture) or they were closely linked to public health (bakery and bread making). Table 8.4 shows that the Act likely had important consequences for Victoria’s labour markets. In each industry, the majority of the workforce was covered by the minimum wage; although the use of apprentices and piece-rate workers, who could be paid sub-minimum rates as low as 2 shillings and 10 pence per week, was widespread, except in the bread and furniture industries. Contemporary observers from Australia and overseas generally believed that the 1896 Act successfully increased wages in covered industries (CBCS 1925; Coghlan 1918, pp. 2110–14; Reeves 1923, pp. 50–69). However, there remain a number of unanswered questions about whether the Act had adverse consequences for labour, such as the extent to which increases in the minimum wage reduced the scale of production or encouraged the substitution of apprentices or piece-rate workers for time-rate workers.

Table 8.4 Coverage under Victoria's *Factories and Shops Act*, 1900

	Minimum		Number		Apprentices		Piece	
	Males	Females	Males	Females	Males	Females	Males	Females
Boot	44/9	27/11	1564	588	731	704	275	12
Bread	51/11	44/0	435	—	187	0	—	—
Clothing	53/6	22/8	455	1701	195	1003	215	1231
Furniture (European)	50/1	39/0	511	32	222	15	4	—
Furniture (Chinese)	48/7	45/2	234	—	37	0	—	—
Shirt	43/4	15/6	22	103	8	133	2	461
Underclothing	40/3	12/10	13	278	4	575	—	295

Notes: 'Minimum' denotes the minimum rate in shillings and pence per 48-hour week. 'Number' denotes the number of employees working at the minimum rate or higher. 'Apprentices' denotes the number of employees allowed to work for less than the adult minimum rate. 'Piece' denotes the number of staff paid piece rates (generally slightly less than the minimum).

Source: Reeves (1923), p. 67.

Conclusion

In the 1840s, labour scarcity was a serious bottleneck for the colonies' economic growth. By the end of the century, Australia had become the richest country in the world on a per capita basis. The labour-supply bottlenecks were addressed in several ways. Immigration resulted in substantial population increases over the 19th century and brought in relevant skills for the expanding primary sector. The growth of primary education increased human capital and produced one of the most literate workforces in the world. Colonial governments and large companies developed sophisticated internal labour markets in order to ensure that they had an adequate supply of suitably skilled workers. McLean has argued that another factor contributing to growth was a very high labour input per capita (McLean 2007). Compared to the United States, Australia had a much higher labour-force participation rate for women. In addition, a higher proportion of the Australian population was male, and thus more likely to be participating in the labour force.

By the late 19th century Australia had among the highest wages in the world, particularly for unskilled workers. However, the fruits of growth were not shared equally. Wages lagged behind GDP growth during the long boom. Work for much of the population was intermittent. The growth of the manufacturing sector brought about problems of 'sweating' – long hours of work, poor lighting and ventilation, unsafe working conditions, low wages, and child labour. The response to sweating was increased union activity and labour legislation. Although in the mid 19th century Australia lagged behind the old industrial powers of Europe in terms of protective legislation, by the end of the century it had perhaps the most progressive legislation in the world.

Colonial enterprise

SIMON VILLE

Introduction

We have observed in other chapters the rapid economic growth and sectoral shifts in activity that characterised 19th-century Australia (Madsen, this volume). Enterprise made an important contribution to this story, particularly by responding to extreme economic uncertainty in the early period, meeting the opportunities presented by expansion in the middle years of the century and adjusting to the cyclical vicissitudes of the latter years prior to Federation. At the same time, business enterprise played an increasingly important role in shaping that environment and the economic evolution of the Australian colonies.

This chapter develops in new directions the author's earlier survey of Australian colonial business (Ville 1998). While the original framework of three key periods remains valid and will be revisited briefly, in the interim important works have extended our knowledge and understanding of Australian business. In particular, we have begun to appreciate clearly the sustaining role of business cooperation in a small, remote economy, and the rich sources of social capital that underpin it. Foreign multinational enterprise, central to post-Federation Australia (Merrett, this volume), was already gaining importance, particularly in the finance sector. The nature of the business institutions that have supported the broadening resources sector and the development of local commodity markets, especially in wool, is also clearer.

The chapter is also an opportunity to provide a more nuanced account of business in several important respects that were not possible in the first, broad survey. It will compare the differing pattern of business across the colonies and between city and bush, examine the growth of firms in manufacturing, look at plant size as well as the nature of the firm, interrogate major public forms of enterprise, and address briefly the question of Aboriginal enterprise. These are all key themes especially for an economy that has

relied heavily upon government enterprise and has been characterised by geographically distinctive forms of economic activity. Finally, we have the opportunity to investigate an important comparative question – the degree to which Australian enterprise shared in the movement towards a more scientific and generalisable approach to the practice of management that was starting to take hold in several nations towards the end of the 19th century, particularly the United States, Britain and Japan.

Entrepreneurs and their firms rely heavily upon accurate and timely information to plan their strategies. Australia's 'tyranny of distance', sitting on the geographical periphery of the world economy in the 19th century, with infrequent external contact, meant vital commercial information was sparse, belated and often inaccurate. The situation improved in the course of the century with greater regularity and rapidity of communication, especially after the arrival of the oceanic cable in 1872, but making decisions while grappling with highly imperfect information was a key feature shaping the nature of colonial business.

The contours of colonial business

Coping with uncertainty: entrepreneurship and strategy in the early colonial economy

Uncertainty is a valuable organising principle from which to analyse early colonial business in Australia. As Knight (1921) indicated nearly a century ago, subjective *uncertainty*, where there is no clear basis for predicting the outcome, can be distinguished from objective calculable *risks*. Poor information was a major source of uncertainty together with severe labour and capital shortages, limited technology, small shallow markets, illiquidity combined with a multiplicity of mediums of exchange, few overseas commercial contacts, and the ambiguous political arrangements within the new colony and in its relationship to the British government (White 1992, ch. 4). A low-trust environment might distinguish a convict colony and deepen the problems of information acquisition. Uncertainty thus impacted critically on most aspects of decision making. Some Australian entrepreneurs drew on previous experience, largely in Britain or India, but still encountered many new challenges. Most had limited resources to fall back on. When a prolonged drought, a financial crisis in England and the ending of the French Wars boom created a 'perfect storm' in the middle of the Macquarie era, many firms were ruined. Uncertainty, particularly through imperfect information or 'gaps' in the market, also provided entrepreneurial opportunities for arbitrage and

speculation (Leibenstein 1966; Kirzner 1979). Judgmental decisions, those taken under conditions of uncertainty, are often regarded as the hallmark of entrepreneurship (Casson 1982). Wide price fluctuations and spreads in the purchase and sale of goods generated opportunities for general merchants with broad stocks of goods, while supply irregularity encouraged the growth of secondary markets (White 1992, pp. 73, 112).

The strategies of most firms were thus shaped by a desire to mitigate or exploit uncertainty. Mercantile trading was common particularly where it drew on a supply of imported goods. The irregularity of shipping arrivals emphasised the competitive benefit of securing supply chains for scarce goods. Trading could be conducted on a small scale with minimal capital and skilled labour. Backward vertical integration into shipping mitigated delays on irregular coastal routes and avoided contractual hold-up by the few ship-owners. Successful firms expanded by diversification of function and product, which eased the constraints imposed by small markets and volatile trading conditions. Sydney trader Robert Campbell dealt in a breadth of commodities imported from his family firm in India and developed his own whaling, shipping, banking and farming interests. The emancipist Simeon Lord combined trading and shipping with auctioneering and manufacturing. John Macarthur, a former officer of the New South Wales Corps, mixed whaling, shipping, commodity dealing, farming and the breeding of merino sheep. The emancipist Samuel Terry had extensive interests covering retailing, inn keeping, real estate, shipping, banking, flour milling, carriage services and livestock grazing. Thus, diversification was sometimes pure risk spreading into unrelated activities but also leveraged economies of scope by using the same assets across multiple activities. Campbell owned warehouses and vessels for diverse importing and trading. However, the most valuable 'transferable assets' were entrepreneurial skills. Merchants built business empires through a flexible entrepreneurial perspective that enabled them to manage diverse information across products and functions.

The convict colonies were a source of capable entrepreneurs. The need for legitimacy, esteem and recognition among reformed convicts, combined with the denial of more conventional routes to achievement, spurred entrepreneurial activity. Government officials enjoyed strategic political and financial connections and probably higher levels of education. Locally domiciled merchants brought prior experience, overseas contacts, and access to market and technical information. Campbell's personal attributes included acumen, determination, integrity, independence and self-confidence, to which he added experience working for his father's firm in Calcutta. Samuel

Terry's entrepreneurial attributes included shrewdness, frugality, and skills in identifying gaps in the market and anticipating market fluctuations. He was also accused of unscrupulousness, exploiting unpaid debts to acquire blocks of land, conforming, perhaps, to a 'larrikin' image. Like many early entrepreneurs, Terry conformed closely to Kirzner's arbitraging entrepreneur, exploiting situations of uncertainty or market gaps. In other words, their entrepreneurial skills were flexible and expansive in perspective, probing the environment for new markets and commodities, in strong contrast to those of the expert or specialist who focused on industry-specific skills and expertise.

Economic expansion and business specialisation

The rapid mid-century expansion in the Australian colonies provided opportunities and challenges for business. The pastoral boom that began in the 1830s and the gold rush of the 1850s motivated rapid increases in exports, immigration, per capita incomes, and transportation. Increased population and its urban focus meant larger, denser markets, while transport improvements widened markets within and between colonies and overseas to New Zealand and the Pacific Islands. These macroeconomic developments produced a larger, more skilled and mobile workforce, an improved supply of good quality entrepreneurs and managers, and an expanded provision of investment and credit. Larger, more specialised firms emerged as strategies shifted from scope to scale economies in response to expanded markets. New industries came into being and others subdivided into specialisations, while the manufacturing sector emerged more fully as domestic demand rose to the minimum scale often required (Hutchinson, this volume). Entrepreneurship favoured greater focus and expertise in place of the broad purview of the pioneers. Tackling uncertainty gave way to grappling with complexity in handling growing volumes of information. As firms grew in size and reach, owner managers faced new control challenges and had to make decisions about delegating responsibility to salaried managers who were sometimes distantly located.

The production and trade in raw wool provided a key backdrop to economic and business development in colonial Australia (Greasley, this volume). Directly, it spawned a long supply chain of specialist firms in transport, marketing, finance and equipment. Central to this supply chain were the stock and station agents who conducted livestock and property auctions, consigned wool to London markets and facilitated rural finance. They were the conduit between the farmer and the national and international commodity and

financial markets (Ville 2000). As the wool market relocated from London to Australia from the late 19th century, the larger agents reinvented themselves as selling brokers conducting auctions. By the Federation decade they dominated big business (Fleming, Merrett & Ville 2004, pp. 55–6). The structure of pastoral producers, by contrast, became less concentrated and specialised due to land distribution policies introduced in the 1860s and the coming of refrigeration by the 1890s. Land policy, by reducing the size of the production unit, raised productivity by transferring land from large squatter holdings to more intensive cultivation in smaller units. Refrigeration encouraged mixed farming, such as wool with meat or dairy production, which helped to spread risks in volatile commodity markets.

The gold rush spurred corporate growth and specialisation, initially through small individual prospectors and partnerships. However, their capital raising limitations soon became evident as shafts deepened and more equipment such as batteries were needed. Clunes Quartz Gold Mining Company (1857) was a cooperative of 100 miners who each owned a share and worked for the enterprise. While broadening ownership, it experienced problems of differential effort among the member workers. Mining dominated the incorporated enterprises that flowed from the new company legislation of the 1860s and 1870s. Benefiting from Victoria's pioneering 'no liability' mining company reform of 1871, mining spawned 1000 companies in Bendigo alone by the end of the year (Blainey 1963, pp. 75–6). Most remained small and many were speculative ventures, until the Broken Hill boom of 1887–88 that attracted significant inter-colonial investment (Blainey 1968, p. 30).

The 1830s witnessed the formation of British banks in Australia under the impact of the wool trade, notably the Bank of Australasia, the Union Bank and the Bank of South Australia (Maddock, this volume). Further expansion occurred in the 1850s, particularly of colonial banks such as the Bank of Victoria, the Bank of Tasmania, and the Australian Joint Stock Bank, each commencing business in 1853. In the wake of the mining boom, banks handled and bought gold, issued bills of exchange and offered advances on them. Their numbers rose in the 1850s from eight to 15 and their branches from 24 to 197 as they established themselves across the goldfields but also in ports and at regional centres that supported both mining and pastoral enterprise (S. J. Butlin 1986, pp. 7–11). Specialist financiers emerged – savings banks, building societies, friendly societies, and insurance, investment and land companies – tailored to serve a widening range of funding needs. Retailing, stockbroking and shipowning were among other service industries affected

by the growth of scale and specialisation in business (Ville 1998, pp. 28–9; Keneley, this volume).

Manufacturers were among the main beneficiaries of economic expansion. The sector's share of GDP more than doubled to 12 per cent by the time of Federation. The demand for food, drink, tobacco, clothing and textiles expanded with the rising population, building materials with increased urbanisation, and metals and machinery with the growing need to service and repair engineering equipment in transport, mining and pastoralism (Hutchinson, this volume). Factory production began to replace workshops and the amount of capital equipment deployed rose. During 1871–91, the number of factories in Victoria nearly doubled to 3296, and their employment tripled. However, this is a gradual story. Most industries remained atomistic in structure, and firms were located at just one or several sites. The average factory employed only 17 people by 1891 and capital–labour ratios only increased marginally (Butlin 1964, p. 207). Even among the larger firms, factory production often relied on minimal technology and resembled an agglomeration of individual workshops. A picture of the Sargoods Melbourne clothing factory in the *Illustrated Australian News* (3 November 1874) boasted a large multi-storied building arranged into departments. However, the picture reveals individuals working at their own spinning or sewing machines, with no evidence of larger powered machinery. Exceptionally, capital–labour ratios rose more in metals and machinery to service power-driven agricultural equipment (Butlin 1964, p. 209). Although brewing was a specialist occupation from the early years of colonisation, the size and concentration of the industry was transformed in the second half of the century by urbanisation, transport services, technical improvements and greater product flexibility. The expansion of brewing in turn fostered specialist local suppliers, such as Joe White Maltings.

In some industries specialisation was limited. This might result from an insufficient increase in demand in that sector or geographic area, such as shipping and agency services in northern Queensland. An innovative entrepreneur, such as Thomas Mort or the Bright brothers, might wish to build a diverse business empire. Finally, the production needs of several industries influenced the pattern of growth. The sugar producer CSR integrated growing and milling on a single site to ensure continuity of output, to provide effective supervision of imported labour from pre-capitalist societies, and to foster closer control of accounting, planning, and strategic decision making. Graves concluded that this sophisticated organisation was 'quite exceptional for the period' (1993, p. 132). In spite of these organisational achievements,

the plantation was replaced by the central milling system in the 1890s, which decoupled cultivation and overcame the problem of rising labour costs by substituting machinery.

The largest business enterprises that emerged from mid-century were owned by governments as part of the colonial socialism movement (Ergas and Pincus, this volume) and were mostly found in network industries where they operated as natural monopolies, particularly the railways and postal services. The New South Wales Government Railways (1855) and Victorian Railways (1859) assumed control of railway building and operation in their respective colonies over the following decades, with similar experiences in other colonies. In terms of capitalisation and labour force, they towered over private enterprise. By 1900 the New South Wales Government Railways employed more than 14 000 workers at a time when most large enterprises would have counted their workforce in hundreds (Railways Commissioners 1900, p. 24). By 1910 the asset value of Victorian Railways was nearly six times that of the largest private non-financial firm, Dalgety (Fleming, Merrett & Ville 2004, p. 14). Colonial postal and telegraph departments were similarly huge enterprises that stretched over vast areas and counted many hundreds of branch offices. By 1891 Victoria counted 1729 post offices in its network and New South Wales 1384 (*Year Book* 1912, p. 755). When the state offices merged in 1901, the new federal Postmaster-General employed nearly 16 000 workers across some 7400 offices (Moyal 1984, p. 88).

Aboriginal business

We have limited information about the nature of Aboriginal enterprise in 19th-century Australia. While traditional Aboriginal economy was based largely on subsistency, there is evidence of a greater diversity of enterprise. Organised large-scale production, such as kangaroo hunts and eeling, used capital and labour to obtain food and make household goods and tools. Specialisation included the production of specific tools by different groups and formed the basis for a limited amount of trading (Butlin 1993). Cooperation among participants and having regard to the management of resources have also been noted by recent authors (Gammage 2011).

While these forms of Aboriginal production were quite different from the settler market economy, the arrival of large numbers of migrants led in places to hybrid forms of production. This combined settler-based markets with Aboriginal customary production. In some cases, when the two groups worked together the Aboriginal contribution was limited to providing resources and labour (Lloyd 2010, pp. 29–31). In others, though, there

was evidence of forms of Aboriginal enterprise. Boyce (2008) variously describes the joint enterprise of Aboriginal people, convicts and emancipists in Tasmania in the early 19th century. In the cattle industry of northern Australia from the mid to the late 19th century, the Aboriginal community sometimes played a role beyond supplying labour that was based on a form of stewardship of the land (Lloyd 2010, p. 33; McGrath 1987). In the Cape York tin industry after 1885 some Aboriginal people served in self-employed roles (Anderson 1983). Over time this joint enterprise evolved or declined. In Tasmania the colonial government seized much of the relevant land for sheep stations to be developed by settlers, while Aboriginal agency increased in the northern cattle industry in the 20th century.

A geographic anatomy of enterprise

The spatial story is multilayered – the intra-colonial pattern of business between city and country, the relationships among the colonies, and the international connections. The essential picture is the growth of large services and manufacturing firms in the capital cities, particularly Sydney and Melbourne, with strong synergies to rural and regional areas. These economic imperatives largely explain the pattern of urban development (Frost, this volume), with Sydney and Melbourne emerging as the dominant centres of population by the late 19th century. In the other states, there was greater geographic dissipation of enterprise and less industrial concentration. Some major resource firms and processors flourished beyond the cities close to the sources of raw materials.

The early convict settlement in New South Wales at Botany Bay, and the attempts to limit the area of occupation, meant that most of the pioneering mixed-business entrepreneurs discussed earlier worked around Sydney. The extension of physical infrastructure in the early decades of the 19th century, especially under Macquarie, and the activities of the earliest squatters, facilitated the spread of enterprise outwards, particularly in the form of large pastoral units. Small-scale enterprise supported pastoral settlements, given the initially high cost of inland transport, such as bakeries, flourmills, blacksmiths, breweries and a range of retail outlets. The gold rush of the 1850s spurred a major business boom in the new colony of Victoria. Banks followed the miners into Victoria: the colony's bank branches rose in number from just six in 1851 to 105 by 1860, or from a fifth to more than a half the national figure. The stimulus motivated larger and more specialised enterprise, particularly engineering firms serving the increasingly capital-intensive

mining boom. By 1864 three large foundries at Ballarat (the Victoria Railway Foundry, the Phoenix Foundry Company and the Soho Foundry) produced pumping, puddling, winding and stamping gear together with stationary engines. When the mining boom subsided, the stronger firms diversified into related products, such as railway equipment (Linge 1979, pp. 189–90, 350–1). Melbourne, as the export port, attracted banking, shipping, importing and other supporting services and powered ahead of Sydney by the 1860s as the leading business centre. Victoria was first to introduce company legislation in 1860, first covering mining and then all sectors four years later. New South Wales followed with legislation in 1861 and 1874 respectively. The stockbrokers J. B. Were based themselves in Melbourne to exploit the growth of share transactions. By 1860 there were 10 specialist brokerage houses in Melbourne. Sydney with just three had to await the mining boom of the early 1870s in New South Wales for a major expansion in stockbroking; by 1874 it had 14 firms (Salsbury & Sweeney 1988, pp. 24–7, 86–92). By 1891, on the eve of the economic and financial crisis, Victoria led the way on industrial employment – 96 000 compared with 75 000 in New South Wales (Butlin 1964, p. 201).

In 1841, five years after settlement, South Australia's first copper discoveries occurred at Glen Osmond. Further finds, especially at Kapunda (1844), Burra (1845), Wallaroo (1859) and Moonta (1861), made the colony one of the world's leading producers. Manufacturing was the product of processing its local resources – copper smelting, flour milling, and agricultural implement making and repair – attracting firms to regional centres such as Gawler and Quorn. Queensland enterprise was more broadly distributed because pastoral production, sugar and mining were widely spread through a massive hinterland and exported via Townsville, Mackay, Rockhampton and Maryborough. The Mount Morgan Mining Company (1882) exported large amounts of gold, copper and silver through Rockhampton, connecting to the port initially by wagons and in 1898 by a rack and pinion railway to cross the Razorback Ranges. In the final decade of the century, new gold rushes in Western Australia, particularly at Kalgoorlie and Coolgardie, spurred new companies, settlements and investment in major infrastructure in that colony, particularly when alluvial mining was replaced by deep gold reefs by the end of the decade, requiring substantial capital investments. Companies were floated in Perth, leading to the formation of its Stock Exchange, and from 1894 West Australian gold mining companies were regularly floated in London (Blainey 1963, pp. 171–89). Several made spectacular profits, including Great Boulder, Ivanhoe, Golden Horseshoe, Great Fingall and Sons

Table 9.1 Registration location of top 100 non-financial firms, 1910

Location	No. of companies	Average assets (£ m)	Main sectors (ASIC)
England	31	1.499	A1, F46–7
Victoria	28	0.743	B11, C21–2
New South Wales	20	0.72	F46–7, D36, C21–2
Queensland	10	0.601	C21–2
South Australia	8	0.789	F46–7
Tasmania	2	0.38	–

Notes:

£ = Australian pounds.

One company was registered as 'Australia'.

1969 Australian Standard Industrial Classification (ASIC) sector codes:

A1 Agriculture

B 11 Mining, Metallic Minerals

C 21–2 Manufacturing, Food, Beverages and Tobacco

D 36 Electricity and Gas

F 46–7 Wholesale Trade

Source: Fleming, Merrett & Ville (2004), Appendix 3.

of Gwalia. About 90 companies returned a dividend but the rest, several thousand, made no money for their shareholders (Blainey 1963, p. 207). The search for copper at Mount Lyell led to the flotation of 44 companies in Tasmania in 1887–88 (Blainey 1963, pp. 225–6). Tin, silver and gold were also extensively mined. In their wake, the miners generated enterprise in ancillary industries, such as engineering, railways and smelting, and fostered the economic development of towns and regions, as the Mount Lyell Mining Company did for western Tasmania (Blainey 1954).

Table 9.1 shows where the leading 100 Australian corporations were registered shortly after Federation. It confirms that Victoria and then New South Wales had emerged as the main local centres of large-scale enterprise and that mining and manufacturing were more dominant in Victoria than New South Wales.

As firms grew in size in the wake of the mid-century economic expansion, some crossed inter-colonial borders, thus moderating the distinctiveness of business in each colony. This occurred mostly in service industries where firms followed the spreading population. The local branch was a key competitive device among banks, insurance companies and pastoral agents, which they replicated in a fairly modest form across the major pastoral and mining districts. Thus, by 1892 six banks had branches across four or more colonies. In a

similar fashion, Colonial Mutual Life had branches in all states from its establishment and AMP (formed 1849) had completed a national network by 1884 (Fleming, Merrett & Ville 2004, p. 66). Some of the stock and station agents, particularly Dalgety, crossed over colonies; it had a national network across five states before 1914 but the typical agent remained small-scale and local. Some network industries were naturally suited to inter-colonial operations. The road haulier Cobb and Company began operating between Melbourne and the goldfields in the 1850s, before expanding into Queensland and New South Wales. By the 1870s it was a virtual monopolist in Victoria and controlled most of the trunk services. In shipping, Adelaide Steamship and Huddart Parker operated around much of the Australian coastline, with offices or agencies in the major ports (Fleming, Merrett & Ville 2004, p. 67).

However, for the most part national businesses did not eventuate until after Federation. Even most of the larger service firms had their roots anchored in a single colony from which they were tentatively expanding. Most major manufacturers served a single colony in the 19th century; they spread out from their urban production location from mid-century, helped by the developing railway network of each colony, to capture rural markets and drive out smaller local factories. Butlin's data on factories, employment and capital for Victoria suggests, though, that this was not a continuous process (Butlin 1964, pp. 201–2). The colony-specific pattern of consolidation in brewing illustrates the regional distinctiveness of business development. The number of breweries in Victoria expanded from 35 in 1856 to 126 by 1871. Thereafter, improved transportation, technological leadership and the acquisition of tied houses resulted in a small number of Melbourne-based breweries dominating the colonial market. A series of mergers, takeovers and closures in the 1880s meant that by the 1890s there were only 60 to 70 breweries, nine of which were dominant (Dunston 1987, pp. 7–33). A similar pattern of concentration occurred in Sydney and Adelaide at the end of the 1880s (Linge 1979, pp. 520–2, 593). In Perth, Swan was the dominant producer by the 1880s, supplying three-quarters of licensed outlets in the city. However, there remained 38 breweries in Western Australia at the time of confederation and here, as in other states, consolidation at the state level continued into the new century (Welborn 1987, p. 46, 97).

The distinctive intra-colonial pattern of expansion has several explanations. For much of manufacturing, the potential for plant economies of scale encouraged localisation of production. 'Exporting' this output to the other colonies, perhaps through sales centres, still faced obstacles so that distribution networks tended to be intra-colonial. Technological constraints on the

transportation of goods limited the distances they could be moved, as was the case for brewing until techniques were developed in the 1880s to mitigate beer's rapid deterioration under transport in a hot climate (Parsons 1971, pp. 142–5). The cost challenges of carrying bulky goods and their trans-shipment added to these challenges. Each colony built its own government rail system that promised more efficient long-haul conveyance. However, unlike the other transport modes, railways contained design and operational features that were intended to maximise intra-colonial trade to boost the local 'multiplier' effect. Substantial contracts were awarded to local engineering firms in the main construction periods of the 1870s and 1880s, providing them with sufficient long-term work to invest in capital equipment (Linge 1979, pp. 2–3). Variations in rail gauges between colonies and the construction of networks linking with that colony's leading ports rather than crossing over, or connecting with, inland borders fostered intra-colonial trade. New South Wales (1876) and Victoria (1885) introduced tapered freight-rate schedules – offering lower rates on longer hauls, they were designed to ensure inland wool clips were shipped to ports within that colony. Finally, the establishment of inter-colonial 'import' tariffs might be expected to discourage cross-border trade. Whether they actually increased local production and trade is more questionable (Wilson & Shanahan 2012). Regional differences also provided some useful complementarities and interdependencies. Seasonal labour from New South Wales helped man Queensland's sugar plantations and Victoria's coal-fuelled factories. South Australian copper ores supplied Newcastle smelters (Linge 1979, p. 13).

British multinationals established themselves in the Australian colonies in the 19th century. They were primarily based in land ownership, mining and commodity trading, and service industries such as banking, stock and station agency, utilities and transport. Many took the form of 'freestanding companies', whose operations were largely based outside Britain. They drew finance, business connections and entrepreneurial expertise from a physical presence in the City of London. British multinationals accounted for 31 of the top 100 non-financial firms in Australia (Table 9.1), including six of the top 10. On average they were twice as large as firms in the top 100 list registered in the Australian colonies.

Some British firms leveraged these competitive devices across several settler economies, such as New Zealand, South Africa and Argentina. Managing an enterprise at such long distances in an era of slow communications created problems of agency and required an understanding of rapidly changing business environments. Some firms addressed this problem by appointing

British-based senior managers who were from Australia and by sending out inspectors on a regular basis. Nonetheless, there appears to have been a shift in the locus of control of many firms by the end of the 19th century so that management was exercised in Australia (Ville 1998, p. 33). By contrast, the outward transmission of international businesses from Australia was largely a phenomenon of the second half of the 20th century (Merrett 2002a).

American multinationals entered Australia in the several decades leading up to World War I. This was on a more modest scale, and Australia ranked much lower in the priorities of American investors than of British ones (Wilkins 1970, p. 110). They followed the classic line of development, with Australian operations forming a branch of the main domestic company, rarely in the form of a local subsidiary. American firms were mostly found in manufacturing and petroleum. Singer arrived in Australia in the 1880s and General Electric in 1898, and like most American firms before 1914 they restricted their activities to sales. An exception was American Tobacco: it began manufacturing in Australia in 1894 and by 1901 was producing 200 million cigarettes here, far greater than its output in Canada, Japan or Germany (Wilkins 1970, p. 186).

The cooperative foundations of colonial business

In his classic comparative study of the growth of modern business in three nations, Alfred D. Chandler (1990) contrasted *competitive* managerial capitalism in the United States with *cooperative* managerial capitalism in Germany as alternative paths to a modern corporate economy. In a more nuanced study of Japanese enterprise, Fruin (1992) analysed firms' competitive strategies but cooperative structures. Of course, in most firms cooperative and competitive elements are blended in varying proportions. Typical competitive strategies, such as cost leadership or product differentiation, encourage firms to prosper by driving others from their market. A range of cooperative strategies are available to firms such as networks, alliances and joint ventures (Boyce & Ville 2002, ch. 9). The benefits of cooperation include sharing tangible and intangible assets, such as commercial information, complementary expertise, physical property, and equipment. They are ways of lowering transaction costs and of establishing professional and procedural rules in an industry or market. Less commendably, cooperation can be driven by rent-seeking motives to limit competition and raise prices.

Enterprise in the Australian colonies was replete with cooperation. It offered a partial antidote to uncertainty in the early settlement by sharing

knowledge, providing trade credit and offering access to markets. Robert Campbell, Simeon Lord and other pioneer entrepreneurs recognised the value of building cooperative networks. We often think of networks as bound by social, religious or kinship ties that enhance trust and the ability to monitor for opportunism. Several business alliances were organised according to groupings of officers, emancipists or free merchants. However, Johns' research, based on the transactions ledgers of the Bank of New South Wales, suggests that networks also crossed social groups who rarely mixed in their private lives. This provided cross-fertilisation of knowledge, skills, trust and connections (Johns & van der Eng 2010; Johns & Ville 2012). Robert Campbell junior (nephew of Robert Campbell) and M. Robinson, an emancipist, conducted plenty of business with each other and with many other entrepreneurs, big and small and from different backgrounds, across Sydney. What Granovetter (1973) once referred to as the strengths of weak ties and Burt (2001) the 'boundary spanners' who fill structural holes between networks are in evidence here.

In the middle decades of the century many firms concentrated on internal growth in response to the opportunities offered by economic expansion. Where cooperation continued it took a more systematic and regular form as firms were now larger, better organised, closely located in the major capital cities and more accustomed to the game-playing strategies of their competitors. These conditions spawned local Chambers of Commerce to manage the development of common-interest issues, such as professional standards, market procedures and the building of infrastructure. Sydney had established a Chamber of Commerce as early as 1826 and Adelaide in 1838 but these proved initially unstable and intermittent organisations. The establishment of legislative councils, though, motivated a rush of new or revived Chambers in 1850–01, at Melbourne, Hobart, Launceston, Sydney and Adelaide, to lobby government, particularly on tariffs policy. Chambers of Manufacturers followed with the expansion of that sector, including the Victorian Chamber of Manufacturers, temporarily from 1865 and permanently by 1877; and the Chamber of Manufactures of New South Wales in 1885 (Anon 1979; Hall 1971). The rise of large-scale trades unions in the 1870s and 1880s (Seltzer, this volume) prompted the formation of employers unions to address industrial relations issues in Victoria (1885), South Australia (1887) and New South Wales (1888) (Matthews 1983, pp. 116–20).

The economic uncertainty of the 1890s and industrial unrest and strikes of shearers, maritime workers, and miners encouraged greater cooperation among regional employers associations, which led to the creation of national

bodies in that decade – the Australian Chamber of Commerce, the Associated Chambers of Manufactures (1908) and the Australian Council of Employers' Federations. These could more effectively negotiate with the emerging trade unions and lobby governments.

Many firms also reverted to cooperative behaviour with each other. By the end of the century, inter-firm agreements had spread widely, including in the brick, confectionery, sugar, tobacco, dried fruit, fresh produce, mineral oil, coal and shipping industries (Wilkinson 1914). The scope and formality of the agreements, and entry barriers varied, between industries and over time. Many of these industries produced staple homogeneous goods or services for whom product differentiation and output reductions were not promising strategies in times of reduced demand, and thus agreements mitigated the risk of price wars.

The prevalence of price fixing led to community concern as to whether cooperation was contrary to the public interest. In contrast to the 1890 Sherman Act in America, Australia lacked antitrust legislation before Federation. Prosecution as a restraint of trade that was contrary to the public interest under common law was necessary. Effective testing of the public interest was difficult, and in some cases collective action was in the public good. For example, some agreements occurred as a defensive response to predatory action by a powerful up- or downstream firm or group of firms; farmers' cooperatives were sometimes a reaction to powerful flour millers or dairy factories. The Western Australian Shipping Association of colonial merchants was a defensive response to the high freight rates charged by a small group of powerful British shipowners (Broeze 1992). Suspicion also centred around the leadership role of powerful foreign enterprises that might threaten the evolving Australian manufacturing base. Collusion between the International Harvester Company from America and a local firm in 1905, together with subsequent predatory price behaviour, led to the introduction of legislation. The *Australian Industries Preservation Act 1906* outlawed many collusive practices. As Wilson (this volume) shows, contemporary opinion increasingly opposed the risk of cut-throat competition and it became a dead letter.

Cooperation also had constructive motives in building markets and strengthening supply chains. The repatriation of the wool market from London to Australia provided strong economic stimuli for the export ports of Sydney, Melbourne, Adelaide and Brisbane, specifically the arrival of overseas buyers, and the establishment of auction rooms and display warehouses. To compete with London, a new cooperative business model among formerly

competing consignors, now turned brokers, enabled them to establish joint facilities, share overhead costs, coordinate sales and marketing, mediate disagreements and develop standard procedures. Associations of wool brokers were established at each of the regional centres in the 1890s to coordinate cooperation. The regional associations gradually cooperated with each other – for example, over national sales rosters – which lead to a permanent national association in 1920, the National Council of Wool-Selling Brokers. The new market spawned a web of cooperative associations along the supply chain, including among wool growers and buyers. It is a moot point how far these associations colluded for their members' own benefits or operated in a broader public interest. While attempts were made to agree on selling charges, much of their time was spent developing market routines. In addition, self-interest was moderated by the countervailing influence of multiple associations along the supply chain (Merrett & Ville 2012).

While there were powerful motives for business cooperation, the rich vein of social capital running through Australian society moderated the natural competitive corporate instincts and made such strategies achievable. This underlying willingness to cooperate lay behind the broad span of business transactions identified by Johns in early Sydney. Australian rural communities similarly appear to have contained large stocks of social capital that were reinforced by a plethora of inclusive community organisations, such as sporting clubs, charity groups, religious gatherings, agricultural and horticultural societies, farmers' clubs and the Country Women's Association (Ville 2005a). Rural businesspeople, such as local stock and station agents, exploited this spirit to build their customer base through social interaction – this goodwill, or 'making connections', was their prime asset. The relationship between social capital and cooperation is also an interactive one. The 'enforced' cooperation later in the century enhanced an underlying sense of trust, further reducing transaction costs.

Business routines or individual practices?

Modern business management draws heavily on the diffusion of scientific research into best practices, contingent on the nature of the environment and sometimes the needs of specific industries. In a classic study of British business at the beginning of the 19th century, Sidney Pollard noted: 'each firm ... was a law unto itself ... in a period dominated largely by pioneers and founder managers apt to stress the differences in individual character ... such questions as the structuring and management of firms must have seemed

too individual, too unclassifiable, to repay further generalized study' (Pollard 1965, p. 255). There were certainly pioneers of good practice in Britain, such as Wedgewood (marketing) and Boulton & Watt (labour management), but their ideas rarely found their way to other firms, which were mostly small-scale and owner-managed by the individualist 'gifted amateur'. By the mid 19th century, American railroads, faced with large labour forces, heavy capital usage and wide geographic spread, began to think about efficient ways of managing large enterprises and became innovative in relation to financial and organisational practices (Chandler 1965). The railroads were exceptional in their scale and specific in many of their operational needs, thereby limiting the spread of these practices to other industries.

The development and diffusion of more general systems of management and organisation began towards the end of the 19th century. 'Scientific' and 'systematic' approaches to management sought effective ways to coordinate the firm's activities in a rational and unified manner. Frederick W. Taylor, Alexander Hamilton Church and J. S. Lewis proved influential in the growth of business practices by the early 20th century (Jelinek 1980). Business schools such as Wharton at the University of Pennsylvania (1881) pioneered the training of professional managers into a common language and set of skills. Larger firms gradually restructured their activities to accommodate managerial specialisations, such as finance, marketing and personnel (Chandler 1969). While more than 10 000 business students attended American educational institutions annually by 1914, some doubt exists about the value of these courses for general management training (Boyce & Ville 2002, p. 40).

We are interested in how far general systems of management and organisation, or routines, had permeated Australian enterprise by Federation. Generally, there were very few Australian businesses that faced comparable challenges of labour and capital size to those of American, or indeed British or German, businesses. Firms remained largely owner-managed, with simple organisational structures and governance techniques. Direct personal supervision by owner-managers and through their foremen was common (Wright 1995, pp. 18–19). However, recent research suggests that towards the end of the 19th century, a few behemoths in railways, banking, insurance and the public service developed similar labour management practices with a view to fostering the skills of their workforce (Seltzer, this volume). Further research might reveal how common this was among industries such as shipping, stock and station agency, communications or brewing.

If size was generally not an issue, challenges of distance did matter. Delegation of operational authority was necessary to distantly located

branch managers of banks, post offices, and stock and station agencies. Ville (1998, p. 35) explains some of the piecemeal strategies used by Dalgety, the National Bank of Australasia, and Burns Philp, to exercise control over long distances with poor communication. These included regular inspections, careful branch auditing, appointing remote branch managers from among trusted head-office staff, and offering additional financial incentives, such as company shares.

In contrast to the United States or Japan, there appears to have been no rush to management degrees. Management publications were thin on the ground until the 1930s. Moreover, most were operational manuals dealing with office procedures, financial processing, relevant legislation, and freight movements rather than broader strategic questions (Braddon 1909; Collins et al. 1924). There were several manuals dealing with the operation of firms in a particular industry and describing the challenges of their processes and products. Some larger firms had their own operating manuals. Highly regarded specialists tended to be those with technical industry-specific knowledge, such as metallurgists and engineers. BHP paid high salaries to American metallurgists and mining engineers such as William Patton, which enabled the firm to dominate the building and operation of concentrating mills and smelting plants.

Accounting as a management tool was in its earliest stages before Federation. The basic techniques of bookkeeping were known among the earliest firms; thus the Bank of New South Wales practised double-entry through the offices of its accountant, John Croaker, who had been transported to New South Wales following a conviction for embezzlement (Booker & Craig 2000). Chou and Paollao (1998, p. 183) conclude 'tentatively ... there was no obvious core of accountancy technique or knowledge'. Accountants were listed in trade directories starting in the mid 19th century but with no agreed set of services. Professional associations were established in the 1880s to accredit accountants and establish a syllabus of knowledge. Publications took the form of basic descriptions of bookkeeping from about the 1870s and then more advanced guides for specific industries, including mining and pastoralism, around the turn of the century (Carnegie 2009, pp. 284, 287–8). Much of the corporate accounting focus was on the development of auditing practices in the service of long-distance British investors. In light of regular evidence of malfeasance, firms would have instructed their accountants to scrutinise accounts for accuracy and maybe cost management.

The economic and financial crisis of the 1890s subjected company-accounting methods, and indeed the profession of accounting, to close and critical scrutiny. It was instrumental in the passage of the 1896 *Companies Act*

in Victoria requiring public companies to publish an audited balance sheet. There remained little evidence, however, of management accounting by the end of the century. Where financial data was used for purposes of strategy, it was mostly the actions of individual entrepreneurs. Thomas Elder kept a close control over the performance of different parts of his diverse wool, wheat and copper business by analysing comparative data. It was thus 'a very personal tool used at the discretion of individuals' (Linn 1996, pp. 36–7, 41). Carnegie's (1997) study of pastoral accounting confirms the individualised nature of company practices. These conclusions are consistent with Wilson and Thomson's (2006, pp. 234–52) view of British accounting practices, although they also identify growth in financial accounting from mid-century resulting from a greater number of more capital-intensive, publicly listed enterprises than was to be found in pre-Federation Australia.

Firms of varying sizes and from different industries drew on the services of lawyers. The Melbourne law firm Mallesons worked for large and small clients, including many leading banks and stock and station agencies. Besides day-to-day duties such as pursuing debtors and court representation, it had plenty of work suggestive of the growing contribution of law to business practice, such as facilitating company flotations, amalgamations and reconstructions. In 1893, for example, Mallesons led the reconstruction of the Commercial Bank of Australia, a large complex task. It seems unlikely that many companies had their own legal teams, although Mallesons was the sole legal representative of several major banks (Campbell 1989, ch. 5). Regular interaction created the learning environment for law firms to advise broadly on processes and procedures with a view to the limits of the law and a knowledge of the practices of other firms. This cross-fertilisation role of law firms in an evolving business community has similarly been observed for 19th-century New Zealand (Stone 1988).

The marketing and branding of consumer goods was in its infancy by the late 19th century in Britain and America, pioneered by companies such as Heinz, Lever and Rowntree (Turner 1952; Laird 1998). Consumer-goods production in colonial Australia was mostly on a scale insufficient to justify investment in brand building. Notable exceptions included Henry Jones' 'I Excel' brand, Bushells' 'Billy Tea' and Arnotts' rosella logo. Crawford (2008) dates the beginning of the advertising industry in Australia from the early 20th century.

This very brief analysis suggests that the practices of colonial firms were heavily individualised around the 'entrepreneur', tempered by exchanging ideas and approaches among the cooperating firms discussed earlier.

Although some common practices may have developed among firms in a particular industry, the evidence of the offices of the colonial Postmaster-General, for example, suggests differences in training facilities and the range of responsibilities of senior officials (Moyal 1984, p. 87). If there is evidence of an evolutionary isomorphism in colonial business practices across the 19th century, its unearthing awaits future research.

Conclusion

Most enterprise in 19th-century Australia remained small-scale and owner-managed. However, some leviathans had begun to emerge that would cast a shadow over the corporate sector in the 20th century: BHP, CSR, Dalgety, the major banks and brewers, and the colonial railways. Each increasingly developed its own internal management systems as they grew but with limited evidence of generally agreed best practices. For all firms, there was a common struggle against multiple sources of uncertainty in a series of tiny colonies distantly located and that often began as convict jails. The challenges were met through a range of growth strategies that drew heavily upon macroeconomic expansion, inter-firm cooperation, and the support of British capital and know-how. The pattern of development diverged between and within colonies, with the larger manufacturers settling in Melbourne and Sydney at the expense of smaller settlements, although the manufacturing sector never provided the locus of growth that it did in several other high-income nations around this time. Mining and pastoralism, the export drivers, naturally spread across broader geographic areas, with the former concentrating ownership under the pressure of capital-intensive production and the latter becoming more broadly owned under policy and technology influences. The service providers to pastoralists – banks and stock and station agents – however, did grow large and began to spread their influence across the continent by the time of Federation.

Infrastructure and colonial socialism

HENRY ERGAS AND JONATHAN PINCUS

Introduction

What is to be done, then, to rescue this country from the sterility to which it is condemned? What means have we of opening it out, and giving to the land a value which will ensure its becoming saleable? Roads, say some; – rail-roads, say I.

Sir William Denison, governor of New South Wales, in 1855 (quoted in Goodwin 1966, p. 282)

Living standards as high as anywhere in the contemporary world – this is the characteristic of the Australian economy in the 19th century most remarked upon. High and rising living standards reflected a number of factors: the discovery and productive use of abundant natural resources seized from the Aboriginal population; a favourable demography; and generally ‘good seasons’. And the growth was prodigious: comparing 1930 with 1850, real GDP was 26 times larger, the population 15 times larger, and real GDP per head had risen 60 per cent or by an average of about 0.7 per cent per year (Butlin, Dixon and Lloyd, this volume). This combination of extensive and intensive growth was facilitated by investment averaging around one sixth of GDP, with the three largest categories being residential, pastoral/agricultural and railways (Butlin 1962, Tables 5 and 8).

Australia was remote from Britain, the initial source of settlers, funds and markets (as well as imported law and culture). The continent was huge, the interior mostly semi-desert. There were relatively few good sites for ports, very limited internal waterways and no sizeable permanent lakes. Blainey’s *The Tyranny of Distance* (1966) was a landmark in setting out the importance, in Australian economic and social history, of investment in reducing costs of transport and communications, both privately (such as clipper ships) and publicly (infrastructure).

Unusually for lands of recent European settlement, and contrary to British practice then, Australian colonial railways were financed, constructed and operated by the state. Moreover, other utilities came into public hands, in telecommunications, water and sewerage, urban transit, and power supply, earning the colonies the epithet ‘state socialism’ or ‘colonial socialism’ (Butlin 1959).

This chapter surveys existing interpretations and explanations of the role government played in infrastructure development in the Australian colonies, especially rural rail, providing explanations that blend efficiency, path dependence and, ultimately, vulnerability to rent seeking. In doing so, we address W. K. Hancock’s claim that Australians came to view the state as a ‘vast public utility, whose duty it is to provide the greatest happiness to the greatest number’ (Hancock 1930, p. 72).

The rest of this section relates ‘hard’ infrastructure to land values. Relevant forms of ‘soft’ infrastructure are covered elsewhere in this volume, including natural resources (Greasley, Harris), worker health and education (Hatton and Withers, Seltzer), the financial system (Maddock) and government policy (Wilson, Borland, Keating). Following this Introduction is a section that summarises what was built by way of infrastructure, from the establishment of responsible government until the onset of the Great Depression. The meat of the chapter, ‘Explaining the primacy of government intervention’, examines and refines previous explanations of the dominant role of the state. The consequences are discussed in the penultimate section of the chapter.

Infrastructure and land values

When the colonies were primarily convict settlements, the authorities were responsible for security and law, and for the maintenance of convicts and their keepers. However, authorities also assisted economic development with land grants, convict labour and infrastructure – water supply; roads, bridges and ports; and public buildings, including courts, prisons, hospices and schools. (Housing and urban services are covered in Frost, this volume.) After responsible government, many colonists continued to look to government to assist the private sector; governments responded by engaging in a wider range of activities than was common in Britain; and wider, too, than in some other lands of ‘recent settlement’ (Boot 1998, p. 74.)

With self-government came a real endowment, Crown land. With few settlers, the land was worth not much. To escape this unappealing equilibrium, without relying on transported convicts, Edward Gibbon Wakefield advocated the disposal of land at high prices (as had Bigge, in 1822–23), with

the proceeds hypothecated to subsidise an immigrant workforce whose presence would justify the high initial land prices. Many free immigrants and ex-convicts, however, preferred to work in towns or on their own farms, and not as rural employees. Moreover, by 1851 no system of farming had been developed, profitable enough to justify high land prices, except close to the main colonial markets. And squatters, without legal access to land initially, had already created the pastoral industry, with high capital requirements (Davidson 1981, pp. 73–80).

There was another way to boost the value of land – infrastructure, especially transport infrastructure. Roads were expensive to build and maintain, and road carriage slow at the best of times. River transport was cheap where and when available, but required the periodic clearance of waterways; and canals were mostly infeasible. That left rail: as promoters put it in 1848, ‘the cost of constructing and maintaining economical railways would not, in this country, equal that of macadamized roads’ (Abbott 1966, p. 38).

The pattern of infrastructure development

Ports

The state capitals are major ports, situated at or close to the sites of the first permanent British settlements (Bird 1968). Initially, the flows of goods and people were predominately inwards, and so the progress of colonial ports depended on the development of their hinterlands. Sydney, Brisbane, Adelaide and, to a lesser extent, Melbourne prospered in that regard. The four capitals also benefited from their early proclamation as ‘official ports’ with customs houses; and from their merchant communities’ skills in capturing maritime and railway traffic (Lewis 1973; Broeze 1998). As other hinterlands and regional export activities (like mining) developed, outputs were established; however, there were few suitable sites in New South Wales.

Except for Western Australia and Brisbane, the main harbours were natural. Where physical works were required – removing sand or rock barriers, building breakwaters and dredging channels – these fell to government. For Melbourne, the work was extensive. After agitation from the Chamber of Commerce, in 1876 the responsibility passed to the Melbourne Harbour Trust (Bach 1976, p. 267). The Trust implemented recommendations of Sir John Coode, a leading British harbour engineer. These included creating the Coode Canal, which considerably shortened the distance ships negotiated the Yarra, while harnessing its scouring power (Brown-May & Swain 2005). Coode advised other colonies on improvements to port access and

protection, and location of wharves. His 'usual remedies' were expensive; however, Western Australia's own engineer, Charles Yelverton O'Connor, rejected Coode's proposals for Fremantle in favour of his own, more expensive ones, which were implemented (Bach 1976, p. 250). O'Connor is best known for his successful scheme to pipe water to the goldfields at Coolgardie and Kalgoorlie.

In Sydney, Robert Campbell built the first commercial wharf in 1803; and for some decades most wharves were privately owned. However, following the Bigge Report, the Legislative Council funded the construction of Circular Quay, completed in 1850. From 1876, government took over all wharves. In Melbourne, two private wharves were constructed in the 1830s, but Victoria acquired them after it separated from New South Wales.

The Hobson's Bay Railway Co. opened the first successful steam railway, linking port to city in 1854. Generally, railways were complementary to sea transport, but sometimes in competition with river carriage; coastal shipping could substitute for rail if distances were too great, as in the northern part of Western Australia. However, landside access to ports was mostly unsatisfactory, due to weak or divided authority (Buchanan 1927), and continues to be so.

In contrast with Britain, there seem to have been no private lighthouses. The first lighthouses were opened in 1848, to render passage of Bass Strait safer (Bach 1976, p. 130). The first pilot's licence in Sydney was issued in 1839. Pilotage was initially often provided privately but with public assistance, as was the case in Port Phillip, where the Pilot Board, which had raised its own revenue since 1853, purchased a steamer with a government loan in 1898. In Sydney in 1871 the Marine Board took over responsibility from the Superintendent of Lighthouses, Harbours and Pilots; three of seven board members represented shipowners (Bach 1976, pp. 263–8). Its judicial and administrative functions were separated in 1899, and its powers and duties conferred on the Superintendent of the Navigation Department. There were similar developments in other colonies.

Land transport

No comprehensive history of Australian roads exists: not too surprising, given their variety and the many agencies involved (ABS 1974, pp. 385–93; Lee 2010, pp. 72–113). Initially, most inland carriage was by road. However, the road system was rudimentary by British standards, due to its cost, its experimental technology, and the ineffectual efforts to reduce (through differential tolls) the damage caused by heavy drays, especially when forced, by new

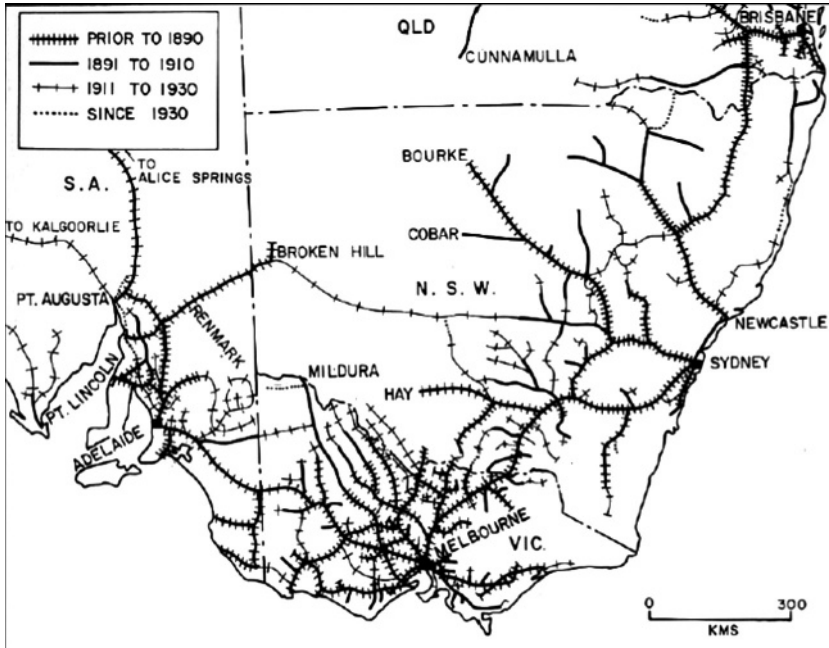
pastoral fencing, onto a narrow track (Butlin 1964, pp. 318–9). Roads proved of minor importance for heavy transport, except as feeders to rail, which was faster, cheaper and increasingly available. Unlike rail, roads never directly generated much revenue; and tolls were abolished in the 1870s. Butlin (1962, Table 8) estimated that capital expenditure on roads rarely reached one-third of rail before the late 1920s. For New South Wales, nonetheless, the length of roads increased from 3200 km in 1861 to around 65 000 km in 1891; but a third were rough bush tracks and private lanes (Butlin 1964, p. 314). Meanwhile, the standard of roads declined, reinforcing the dominance of the railways until the advent of the motor truck.

Both New South Wales and Victoria initially favoured private rail ventures, albeit with land grants and government guarantees. However, most struggled or failed, especially when the gold rushes decimated their workforces. Governments then stepped in, using their superior borrowing and debt-servicing abilities, and broadened the objective to include trunk systems (Lee 2010, pp. 117–29).

Would the traffic revenue be sufficient to justify construction and operating costs? Not from wool or gold. Would the boost to land values bridge the gap, considering how little was suited to closer settlement? The calculations were all very speculative (Goodwin 1966). These same questions reappeared whenever specific projects were proposed, together with those about cost, route, gauge and durability. The colonies more or less systematised their assessments through parliamentary committees, developed a novel ‘commission’ system and reviewed the results through royal commissions. A vigorous press took a close interest. Undoubtedly, there were inefficiencies, waste and corruption. Nonetheless, the railways brought more benefits than costs.

The trunk-line systems of the two largest colonies were mostly fan-shaped, from the capital and port, and eventually extended to the Murray, to compete for the Riverina trade (Map 10.1). South Australia had a similar pattern, except its earlier push to the Murray was from Port Elliott, not Adelaide, and ended at Broken Hill in New South Wales. The striking variation was in Queensland, well endowed with suitable ports, where lines west connected their hinterlands to Brisbane, Rockhampton, Townsville and other ports.

Initially, rail linked well-settled areas – which involved two remarkable ‘zigzags’ in the Blue Mountains (Lee 1988). Subsequently, trunk lines were extended and branches built to encourage grazing and dairying in the Victorian Western district; and into the New South Wales Central Division, for wheat growers and sheep graziers. South Australia joined the Mallee regions to its system, while New South Wales and, later, Western Australia,



Map 10.1 Non-urban rail lines of south-eastern Australia, showing when constructed

Source: Wadham & Wood (1964), p. 16.

spent heavily on construction in wheat-growing areas. Progress was made on coastal linkages.

By 1901 more than 20 000 km of track were open (Table 10.1).¹ In the next three decades, track length doubled; the Trans-Australian line was opened in 1917, crossing the Nullarbor from Port Augusta in South Australia to Kalgoorlie in Western Australia, 1711 km away; urban lines proliferated; and rail services grew rapidly (Butlin, Barnard & Pincus 1982, pp. 268–9).

Table 10.1 shows the rail system initially ‘building before demand’, and thence roughly in keeping with ‘demand’. As the system grew, so did the costs of replacement, so that by 1900 it exceeded the investment in new lines.

Railways absorbed about 40 per cent of public investment during 1860–1900, and 60 per cent of public borrowing – rising to one-half of total British net overseas investment during 1883–90 (Table 10.2; Davis & Gallman 2001, p. 472).

¹ Canada had more than 55 000 km by 1915 (see <http://www.sciencetech.technomuses.ca/english/collection/rail4.cfm>).

Table 10.1 Australian rail network and freight, selected years, 1855–1931

Rail network		Rail freight		
Year	Kilometres open	Year	Tonnes carried ('000)	Relative decadal growth
1855	37			
1861	390	1865	1200	
1871	1657	1870	1631	
1881	6456	1880	3903	1.6
1891	15 290	1890	10 577	0.9
1901	20 240	1900	13 703	1.0
1911	25 876	1910	21 191	0.8
1921	37 492	1920	31 293	1.0
1931	42 867	1930	31 599	1.1

Notes: Entries in the final column show the ratio of growth in network to the growth in freight, for each 'decade': e.g. 1.6 = (network 1881/1871) ÷ (freight 1880/1870).

Source: Vamplew (1987), p. 168.

Table 10.2 Investment, 1861–1900: some ratios

Public plus private investment/GDP	16%
Public investment/GDP	7.6%
Public rail investment/Total public investment	43%

Source: Butlin (1964), Tables 9 and 10 (includes local authorities and defence).

Post, telegraph and telephone

Telecommunications illustrate several features of our story: rapid adoption and expansion; early government initiative or takeover; inter-colonial cooperation and rivalry; creation of vested interests; preference for one mode over another.

As with transport, the economic and social case for investment in communications sprang from the 'tyranny of distance'. Following the British model, each colony established a postal service (New South Wales first, in 1809), initially utilising existing buildings for sorting, but later often-splendid edifices in cities and towns. New South Wales set its own postal rates from 1825; uniform inter-colonial rates were agreed in 1849; all colonies joined the

Universal Postal Union in 1891. At Federation, the Commonwealth assumed power over all forms of telecommunications; however, it took decades to negate the effects of previous separate ownerships.

The telegraph was quickly adopted by business, including the press, to bridge the great distances within Australia and to the outside world. Although the first line – Melbourne to Williamstown in 1854 – was private but with a public subsidy (this was also the case in Queensland and Western Australia), telegraphy soon became government owned and run. Railway easements were useful for the siting of lines, which led to a struggle for control in New South Wales. Inter-colonial cooperation meant that by 1858 Sydney, Melbourne and Adelaide were connected, Tasmania by 1869, New Zealand by 1876 and Western Australia in 1877. However, the cynosure was telegraphic communications with London; and here the South Australian government made a pre-emptive strike to Port Darwin, with the overland telegraph opened in 1872, and connected via Java. By Federation, Australia had become ‘one of the largest national users of telegraph in the world’ (Moyal 1984, p. 33).

For telephony, the rapid adoption was in the cities. The early initiatives were private, but – at least in Melbourne – frequent complaints from the Chamber of Commerce about high charges and inefficiency induced government to take over in 1886, and cut charges (Davison 1978, p. 26). By 1893, telegraph and telephone were combined in one department in all colonies. Both modes were ceded to the Commonwealth in 1901, which formed the PMG department (dismembered in 1975). In the 1920s telephony boomed and, with telegraph, accounted for more than one-tenth of public capital spending (Butlin 1962, p. 27).

Letters and telegraph were vital modes of communication before 1900; subsequently, they faced competition in a growing ‘market’ from the telephone and, to a lesser extent, from wireless telegraphy. After an initial period of ‘suicidal parsimony’, from the 1920s the PMG enthusiastically embraced new technology, to reduce labour costs (such as automatic telephone exchanges) and increase speeds and coverage, especially long distance. The Melbourne to Sydney line, opened in 1907, was reconstructed after 1925, using carrier wave transmission. By 1930, telephone calls were possible from Cairns in northern Queensland to Geraldton in Western Australia; Tasmania was connected to the ‘Big Island’ in 1936 by telephone cable. Indeed, the PMG reacted to technological changes by delivery of services that were too extensive, too quickly supplied, too high in quality and too cheap, especially for country customers (Butlin, Barnard & Pincus 1982, p. 294).

When the Commonwealth took control of wireless telegraphy in 1905, there ensued two decades of coexistence of private and government providers of services and equipment. The Commonwealth's initial interest was chiefly in ships-to-shore communication (commercial and naval); private stations also provided this service around Sydney. In 1922 the Commonwealth purchased the dominant private company, AWA, which owned patents and wireless telegraph stations. Using the new 'beam' method of transmission, AWA established high-power wireless links to England (1930) and North America (1938), of value mainly to businesses, and in competition with cable.

To compensate broadcasters and to pay patent fees, in 1923 the Commonwealth licensed sealed radio receivers, tuned to one frequency per licence. The system was soon liberalised to a 'zonal' system, with fees paid to 'A' class, non-commercial broadcasters, the others relying on advertising. The 'A' class broadcasters became the National Broadcasting Service in 1928 and the Australian Broadcasting Commission in 1932. Radio encroached on some established business, especially newspapers and racecourses, but helped other activities (including illegal betting 'shops'). The PMG, solely responsible for transmission, developed a superior transmission mast in the 1930s.

Urban amenities

The siting of the capital cities was largely governed by access to potable water and water transport. Although governments took the major responsibility for water supply and sewerage, they were generally slow to respond to demand and to the negative externalities that accompanied rapid growth: governments had weak planning powers and skills, and experienced difficulty in creating effective administrative controls, and in overcoming vested interests and tax resisters.

The Tank Stream and bore water from the Lachlan Swamp soon proved inadequate for Sydney. However, the colonial government, instead of taking direct responsibility, created the Sydney Corporation in 1842, when the city's population was more than 30 000 inhabitants. The Corporation was prohibited from borrowing, and leading citizens threatened to refuse to pay its rates. Mains were laid where net revenue was readily obtained, serving wealthier inner-city residents, and commercial and industrial users. The vast majority of residents continued to rely on fountains, private water carters or (sometimes contaminated) wells; moreover, various industries were hampered by inadequate water supply, as was fire fighting. With temporary replacement of the Corporation by commissioners in 1853, work started on tapping the Botany swamps, using loan monies. The rapid turnover of mayors left

Table 10.3 Population served with water and sewerage services, 1891–1931 ('000)

	Sydney		Melbourne		Brisbane		Perth	
	Water	Sewerage	Water	Sewerage	Water	Sewerage	Water	Sewerage
1891	365	129	487	—	n/a	—	n/a	—
1901	491	370	495	183	78	—	40	—
1911	696	540	588	516	121	—	73	n/a
1921	1110	745	789	717	207	—	171	n/a
1931	1307	1019	1024	949	327	71	221	99

Source: Neutze (1977), Table 2.5.

control to the long-serving British engineer-in-charge, Francis Bell. After many inquiries, water was finally sourced from the Nepean in the 1880s, and some outer urban areas were connected. Much of Sydney was sewered in the 1850s and 1860s, albeit with discharge into the harbour (Hector 2011; for a less favourable view, see Clark 1978). Public outcry over a typhoid outbreak, and a Royal Commission, led to the building of ocean outfalls in the 1880s; the Metropolitan Board of Water Supply and Sewerage was established in 1888.

Early Melbourne had a plentiful supply of water from the Yarra, but a pollution problem, so that it soon sourced from Yan Yean Reservoir (1857), then the world's largest artificial reservoir. However, Melbourne was decades slower than Sydney in dealing with effluent: only in 1891 was the Melbourne and Metropolitan Board of Works established to take over water supply and to sewer the city; a major investment program was begun, including the treatment farm at Werribee (1897) and discharge into Port Phillip Bay. Adelaide operated the first large-scale system of water-borne sewerage in Australia, in 1881. Brisbane established a sewerage rate in 1923, 14 years after the establishment of the (elected) Water and Sewerage Board; indeed, both Brisbane and Perth residences relied on 'night soil' collectors (colloquially, 'the dunny man') or on septic tanks until well into the 20th century (Neutze 1977, p. 37).

Urban transit

With Melbourne's favourable topology, by 1890 most of the Victorian government's suburban rail system was in place, with the inner city well served by private trams, contracted to the inner-city councils. Although the earliest New South Wales rail lines were urban, for some decades what was built in Sydney were elements of the radial system to the rural regions; the first purely suburban line was built in 1890s (Neutze 1977, p. 21) and far more passengers

were carried on trams and ferries than on suburban rail. Australian cities had extremely high levels of usage of public transport by international standards, with half a billion passenger trips per annum on metropolitan trams by World War I (Cosgrove 2011, p. 3).

As with rural rail, the commercial and economic cases for improvements in urban transit (and amenities generally) depended greatly on the size of induced increases in land values. John Job Crew Bradfield supported his integrated plan for a bridge across Sydney Harbour and associated rail works, with estimates of the increase in the value of north shore land. But 'betterment' levies were not imposed and hundreds of families were displaced without compensation. The loans for the bridge (opened in 1932) were serviced from tolls.

Explaining the primacy of government intervention

The explanation combines chance, ideology, interests and the relative economic advantages of public- and private-sector involvement.

In the background, however, is the nature of the political institutions, and their evolution. After 1856, political choices were made within parliaments whose lower houses were elected by effectively universal male suffrage; and, although the upper houses disproportionately represented propertied interests, the tenor was that of popular democracy. McLean (2013) attributes much of the economic success of the Australian colonies to what Acemoglu and Robinson (2012) call 'inclusive political institutions', not dominated by narrow, entrenched economic interests. There was also an unusually vigorous press.

What of ideology? There may be something in the notion that convict origins, distance from Britain, and the exigencies of Australian life had habituated the colonists to look to government more keenly than elsewhere; but, regarding rail, Butlin remarked that 'except in South Australia ... opinion was originally strongly opposed to government entry into railway building' (Butlin 1959, pp. 39–40). Thus, initially both New South Wales and Victoria favoured private rail ventures, albeit with land grants and government guarantees. However, the early private construction efforts were derailed by gold rushes – 'the failure of private enterprise was, in a sense, accidental' (Butlin 1959, p. 40); the government of Victoria was forced into ownership 'somewhat against its will' (Coghlan 1918, p. 840; also see Lee 2010, pp. 117–21).

The history of rail in the 19th century shows considerable vacillation between government and private roles; thus, some explanation is needed of why the public ownership model, even if initially contingent and accidental, 'stuck' and spread in the Australian colonies. That explanation rests on the initial efficiency advantages being improved upon – combined with subsequent benefits from delivering rents to politically powerful regional constituencies and, eventually, to the systems' employees and their unions.

We now discuss three aspects of rail services: cost recovery, including by the capture of the increase in land values made possible by the provision of rail service; the initial financing of the costs that provision involves; and the actual building, maintenance and operation of the service.

Value capture

Railways were easily justified if their operational revenues matched their costs. But this criterion is too stringent. Indeed, the notion was widespread in the Australian colonies, and elsewhere, that the primary justification for investment in infrastructure – especially rail – was to 'unlock' the value of abundant land resources (Goodwin 1966, pp. 264–98; Clark 1980; Else-Mitchell 1975.) In the 20th century, this notion was formalised as the 'Henry George Theorem' (Arnott & Stiglitz 1979): an extension of a transport network, considered as investment in a local public good, was justified if it boosted land values by more than it cost. In the right hands and circumstances, this idea could enhance economic efficiency; otherwise, it could lead to waste.

In the United States, federal land grants were important to private railways, because the land to be opened up was extremely attractive to homesteaders and ranchers, allowing close and rapid settlement. Moreover, the relevant land was largely unoccupied, except by Native Americans. As a result, railway enterprises could readily monetise the land grants, complementing their operational revenue stream. Land grants had lower value in Canada, where the building of the transcontinental lines was a political decision to link eastern Canada with the west, consequent on the ending of free trade with the United States; hence, the lines were laid well ahead of demand, and over much difficult and infertile territory. Canadian land grants were part of a wider package of assistance, which included a large cash subsidy, loan guarantees and protection from competition, as was also the case in Argentina.

The initial New South Wales Legislative Council resolution in support of railway development, passed on 15 June 1848, provided for land grants to any company undertaking the construction of railways; the Legislative Council noted similar encouragement in British North America. However, conditions

in colonial Australia not only limited the boost that rail would give to land values, but also squeezed operational revenues.

In per capita terms, Australia was better endowed than Europe and the United States with well-watered cropping land, and highly productive pastures (Davidson 1982, p. 4); however, much of the remainder was sparsely settled land of poor fertility and low and uncertain rainfall, with limited scope for 'homesteading'. This was reflected in the greater dependence of the colonial economies on pastoral and mining activities, than on agriculture, compared with the United States and, to a lesser extent, Canada. Thus, Australian rural railways would struggle to generate operating surpluses sufficient to service capital cost, except for lines connecting well-settled areas and towns, where traffic could be attracted from other modes; also, long-distance Australian rural rail could be expected to generate relatively low increases in land values. Moreover, the conditions for their private capture were especially poor, relative to the government sector, for three reasons.

First, the more valuable property had already been alienated or occupied. Second, in much of the remainder, the land value externalities were likely to be relatively small, diffuse, and slow to accumulate. Third, and decisively, the state, in addition to selling or renting land, could also capture land values through export taxes and import tariffs, whose ultimate incidence would fall – however inefficiently – on the relatively abundant factor, land. The state could also spread the risk by developing a diversified portfolio of trunk lines.

An attempt to force adjacent landowners to contribute to railway costs was aborted by near riots in Tasmania (Coghlan 1918, pp. 1223–7). Later efforts at betterment taxes were no more successful (Clark 1980; Archer 1976), with the exception that rents in the Western District of New South Wales automatically increased with the provision of rail service.

Financing

Regardless of how and by whom value was eventually captured, savings needed to be mobilised to underwrite the initial investment. It was more efficient for the colonial governments to access the London capital markets, than for private entrepreneurs to do so. It was also more efficient for governments to invest directly than to underwrite private entrepreneurs. The first notable public loan was in 1858, when Victoria floated £8 million of debentures on the London market. Was success an indication of a systemic superiority to borrow, or merely a temporary one, in the circumstances of the gold rushes? The Australian colonies possessed a number of advantages, and these grew. Although viewed as somewhat wild-eyed by the London markets (note the

frequently acerbic commentary in *The Economist*), they were seen as part of the 'family': claims against them could be pursued through to the Privy Council, and they were under the watchful eye of British governors. Moreover, they had a vigorous press, with an obsessive interest in uncovering evidence of government extravagance and maladministration (La Nauze 2011, p. 159). Although the public accounts were quite deficient initially, governments themselves invested in systematic information gathering and publication (Forster 1986), facilitating monitoring by markets of local conditions; frequent Royal Commissions examined aspects of infrastructure provision (Hughes 1980). Reviewing those myriad forms of scrutiny, Frederic Eggleston, an astute observer and former railway minister, thought that an important factor making for efficiency was that the colonial systems were 'never altogether outside the range of controversy', so 'its protagonists constantly had to prove their case and as difficult problems arose they were compelled to devise methods of solving them' (Eggleston 1932, p. 2). Importantly, all these helped as credentials in the London capital markets.

Further cost reductions came from economies of scale and scope. By bundling claims against a broad range of public assets, the colonies underpinned an especially thick market, so that Australian securities 'absorbed almost three-quarters of the portfolio investment that passed through the formal British capital markets' and gained de facto 'trustee' status (Davis & Gallman 2001, pp. 524, 759–60).

At 56 basis points, the sovereign risk premium on Australian loans during 1870–1913 was low absolutely and relative to South Africa's 83, Argentina's 173 and Japan's 194 basis points (Obstfeld & Taylor 2004, pp. 210–13). However, before the private defaults of the 1890s, Australian spreads were even lower: a mere 25 basis points for New South Wales in the 1880s, when that colony was a heavy borrower – and the risk premiums would have been higher for private sector borrowers, both before and after the 1890s.

To that extent, it would have been efficient for government to undertake the capital raising; but it could simply have channelled the funding to the private sector through cash subsidies and profit guarantees, as in Canada and Argentina. Typically, these latter involved guaranteeing dividend payments of 6–10 per cent; the initial New South Wales scheme promised 6 per cent. Argentina's experience highlights the significance of these exposures. It borrowed in London at a substantial premium, while the Argentine rail companies – despite paying relatively high dividends – traded at a discount. The cost of financing rail guarantees accentuated the pro-cyclical nature of fiscal policy, and was a factor in the Argentine default of 1890–91 (Davis & Gallman

2001, pp. 713, 720). With the Australian colonies' per capita exposure to rail investment being greater than Argentina's (Davis & Gallman 2001, p. 525), such guarantees could have proved costly. Although no Australian government defaulted, Boot (2000) argues that the burden of servicing the public loans damaged the economy.

Managerial and political efficiency

If private ownership brought substantial efficiencies, would it have been preferable for colonial governments to borrow to finance private rail operators?² Possibly not; but judgment is difficult because, in constructing a counterfactual world of private rail, one needs to specify how government would then have acted. In order to proceed, however, we temporarily set politics aside.

For rail, there were no obvious private sector advantages in access to know-how, to high-level engineering and management skills, or to construction labour. The technology of constructing and operating railways was readily transferable, facilitated by the rapid development of an integrated international market in British railway engineering skills and experienced personnel. For example, in 1852, Thomas Brassey was appointed principal contractor for the Canadian Grand Trunk Railway (Buchanan 1983, p. 511); in 1851, South Australia commissioned Benjamin Babbage, Isambard Kingdom Brunel's former assistant, to build its first railway; the legendary Captain Ben Hay Martindale, RE, spearheaded New South Wales' railway development; and eminent London-based engineers, including James Mansergh, provided advice and review. The development of engineering education in Australia later supplied 'great men' who rose to dominate infrastructure construction, including William Thwaites in Victoria and John Job Crew Bradfield in New South Wales. Additionally, the British engineering industry supplied rolling stock and other systems on contract worldwide, later replaced by import-substituting industrialisation (as with brakes in Victoria, at a cost in terms of rail accidents and fatalities).

During the construction phase, governments contracted out most of the work, using day labour; presumably a private venture would have done likewise. There would seem to be more incentives for private managerial efficiencies in the operational stage (as Damus 2008 argues for Argentina), including reaping economies from being the single operator of a network. It is likely,

² For private ventures, experience elsewhere and at other times suggests that dividend guarantees and protection from competition weaken the incentive to achieve maximal efficiency: see Crafts, Leunig and Mulatu (2008) on British railways.

however, that government would have informally influenced or formally regulated a single private operator, possibly weakening those incentives.

This brings us to politics and the counterfactual. Historically, there was constant political pressure; as, no doubt, there would have been with rail under private ownership, especially over the choice of extensions and over fare levels and structures. In the event, the systems were driven into large deficits. As we will relate, in response colonial governments made various efforts to insulate railways and their management from ministerial and other political 'interference' (Butlin 1964, pp. 352–7). It would be gilding the lily to claim the Australian colonies dealt with the challenge of managing government rail systems especially easily or successfully. Nonetheless, the experience with 'independent' commissions was transferred to other utilities. It is, unfortunately, hazardous to speculate on whether the outcomes for rail would have been much better under private ownership.

Whether rail was public or private, political involvement was inevitable. The colonies came early to universal manhood suffrage, and for some decades colonial governments were based on short-lived coalitions, in which members had little to offer constituents, other than private favours at government expense. Thus, the colonial systems were vulnerable to cost-inflating distortions, initially arising from patronage appointments. It took many years before anything approaching a well-defined party system developed (Loveday, Martin & Parker 1977) and for the public service to be reformed. However, because the railways were run in an integrated fashion, they gave rise to permanent government jobs, internal labour markets and unionisation (Seltzer, Ville, this volume); and because railway employees were so many and because of their electoral distribution, they had significant political influence.

Meanwhile, the colonies experimented with various regulatory techniques, including insulating railway and other commissioners from political interference; and establishing parliamentary committees on public works. Initial efforts to insulate railway management – associated with Martindale's recruitment in New South Wales – collapsed, and in both New South Wales and Victoria the systems were run under ministers whose primary resource was patronage, albeit shared with department heads (see Wettenhall 1961, 1987).

Reaction to the extent and nature of political interference came first in Victoria, reflecting the size of the deficits, the excesses of sometime railway minister (and later premier) Thomas Bent, and the decreasing political pay-off from patronage. Franchising of the rail service to the private sector

was considered but rejected – it had failed in Italy and elsewhere. Instead, in 1883 Victoria created an independent commission to run the railways, with Richard Speight as chairman, imported from the United Kingdom to oversee 59 new lines. He was not a success. However, the model was soon adopted by the other colonies or states – South Australia in 1887, New South Wales and Queensland in 1888, Western Australia in 1902 and Tasmania in 1910 – and bolstered by recoupment clauses for losses incurred as a result of ministerial directions, and by the requirement to table ministerial directions. In practice, the commission's independence was clawed back in 1891, 1896 and 1903, making the Victorian commission more subject to direction and daily interference than its New South Wales counterpart (Golder 2005). It is not obvious that private operators would have been assured of much more autonomy.

By international standards, the Victorian commission model was an important innovation, giving rise to Andre Metin's famous descriptor, 'socialism without doctrine'. The commission model was consistent with the spirit of the age, which stressed ministerial accountability to parliament but also sought enhanced professionalisation of the public service, along the lines of Northcote–Trevelyan and of the public service reforms of the 1880s in Victoria and New South Wales. This was the era of the celebrated British administrative 'revolution in government' (Finer 1952, MacDonagh 1977). That revolution reverberated in the Australian colonies, both through the 'generation of the 1850s' (Serle 1977, pp. 316–17) and through the efforts of governors such as the enormously energetic Sir Hercules Robinson, the epitome of Victorian reforming zeal among the emerging caste of imperial administrators (Schreuder 1994).

Moreover, reining in patronage was a response to the changing political context (see Cox 1987; Davison 1978, p. 117 also emphasises the role in New South Wales of the 1872 *Education Act*; see also Golder 2005). By the time James Service attained office in Victoria in 1883, and with the coming of the Parkes government in New South Wales later in the decade, the conditions seemed set for a shift to new forms of political rivalry, more oriented to competition in the supply of collective goods than to the distribution of individualised favours and hence more amenable, than was patronage and clientelism, to efficient service provision. Closely associated was the notion of placing public decisions and public administration more generally on a 'scientific' basis – from eugenics to town and country planning – through its delegation to 'independent' experts and by successive refinement of the administrative machinery.

Whatever its weaknesses, the commission model reduced the pressure to seek efficiencies through the installation of private management, and the model, once well established, provided a template for structuring the provision of a wider range of services, from sewerage to electricity. In that sense, the Australian story seems consistent with models of institutional development that emphasise the role of self-reinforcing processes, in which organisations achieving early success (by accident or design) secure internal and external economies that make their eventual displacement costly, not least by coming to form part of the ‘standard operating procedure’ of social actors (Pierson 2004; Rueschemeyer 2006).

An evaluation of infrastructure investment

A plausible account might confer some initial efficiency benefits to the form of provision that emerged, benefits that were by no means completely dissipated over the next six decades. To what extent does that story accord with evaluations of outcomes?

There has been a lively if limited debate on the contribution of public railways to the Australian economy (Frost 2000; Boot 2000). Coghlan, while regretting that for too long governments sought a commercial rate of return, concluded that railways contributed positively (1918, pp. 836, 1219). For Noel Butlin (1964, Part C), governments beneficially stepped into the breach left by private entrepreneurs, but later crowded out private economic activity, and wasted resources through inter-colonial rivalry and premature or excessive branch lines.

Broadening and updating Coghlan’s ‘social savings’ calculations, Davidson (1982) estimated that the rate of return on rail in New South Wales, for the period 1852–53 to 1919–20, was between 13 and 15 per cent, more than justifying the cost. We note, however, that a favourable result from such a retrospective calculation does not mean that the decisions were justified prospectively.

The bulk of Davidson’s ‘social savings’ are attributable to freight and, in particular, to lower freight rates on rail than on road. Boot (2000) argues that Davidson overstated road rates and understated those for rail; however, Boot did not report the consequences for the rate of return. In his calculations, Davidson (1982, p. 133) assumes wagon freight rates for general merchandise (not wool) were constant between 1855 and 1879, whereas the examples in Table 10.4 suggest otherwise.

Since Davidson’s, there has been little quantitative historical work specifically on Australian railways; but Bogart (2010) included Australia in his

Table 10.4 Road and rail freight rates and times, New South Wales, 1857–71

Journey	Road freight				Rail freight	
	1857		1864		1871	
	<i>Av. days</i>	<i>Av. per tonne (\$)</i>	<i>Av. days</i>	<i>Av. per tonne (\$)</i>	<i>Av. hours</i>	<i>Av. per tonne (\$)</i>
Sydney–Goulburn	17.5	24.5	7.5	7.5	14	4.86
Sydney–Bathurst	23.5	32	11	13	16	5.24
Newcastle–Murrurundi	21	18	8	13	10	4.36

Source: Lee (1988), p. 155.

sample. Using a stochastic cost frontier, he estimated cost-inefficiencies of the railway systems of 18 countries for the period 1880–1912, with a comparison of private and public rail. Australian rail ranked sixth or seventh most cost-efficient, trailing the United States, Belgium, France and the Netherlands; Canada scored badly. Bogart found that the cost-inefficiency of Australian rail would have doubled if only 25 per cent of the construction had been public. It should be reiterated that Bogart estimated cost-inefficiency, not economic inefficiency. A system may be cost-efficient, in that its tonne miles or passenger miles are produced at close to the lowest cost; but those services may not be worth their cost. In particular, economically unjustified branch lines may be built and operated cost-efficiently. Moreover, a cost-efficient railway may be providing economically inefficient cross-subsidies to selected types of traffic or regions.

All other scholarly assessments of Australian rail have been qualitative; all implicitly pose a version of ‘did the actual investment, pricing and operational activities maximize the net economic advantages from rail?’³ The viewpoint is that of a benevolent central planner. For example, the rivalry between New South Wales, South Australia and Victoria for traffic has been widely and reasonably regarded as excessive and wasteful. However, without an explicit counterfactual, it is hard to know what to make of this: would a government monopoly, across the three colonies, have produced a better outcome?

3 Evaluations of non-rail investments have also mainly been non-quantitative; exceptions include Davidson (1969) on irrigation and McColl (1976) on electricity supply.

Butlin (1964) focused on technical and economic decision making, with its initial domination by imported engineers: in New South Wales and Victoria, their emphasis was on building durable lines. (Different gauges were used, for no good reason: see Pratt (1912). In Queensland, the engineers plumped for narrow gauges; in South Australia, for three different gauges.) Although the decision about the routes and timing of the trunk-line construction was taken at the political level, it was initially against relatively strict financial criteria (see also Boot 1998). However, Butlin strongly criticised the ‘fan’ shapes of the trunk systems, especially in New South Wales. Later, investment criteria were often ignored – for instance, in the extensions proposed by the Dibbs government in New South Wales in 1884 – though the reaction against that led to Parkes’ railway legislation of 1888. This required the railways to be operated on ‘principles of commercial probity and intelligence’, and subjected all railway investments above £20 000 to referral to a new Parliamentary Standing Committee on Public Works. Moves along similar lines had already been made in Victoria in 1883, but even then there was competition for rents from traffic from their borderlands. Butlin (1964) suggested that the branch lines paid off, economically, in the 1920s, and this was supported by Davidson’s (1982) estimate.

The two judgments – of lax criteria for creation or extension of branch lines, and a good economic pay-off from the very same lines – can be reconciled by arguing that the projections of benefits were optimistic when made, but turned out to be pessimistic. For some decades, ‘social savings’ on rural lines mostly comprised the reduction in cost of freight from established districts; with branch lines, however, more benefit came by way of the geographical spread of economic activity, albeit some onto marginal land – but without rail, New South Wales would not have become a major wheat exporter when it did. Historical judgment about the adequacy of decision making is further complicated by the fact that, in the 1920s, when most of the country branch lines had been completed, road transport was looming as a major threat – ironically, roads were provided by state governments, and this shaped their reaction, which was to protect their rail enterprises, an effect neglected in Davidson’s calculation (Butlin, Barnard & Pincus 1982, ch. 10).

There are three issues worthy of more attention, concerning city *versus* country.

Did merchant interests in the capital cities, particularly the ‘Sydney Interest’, distort the pattern of rail development into a fan-shape out of those cities, preventing regional decentralisation (Butlin 1964, p. 368)? Frost (1986, pp. 40–55) rejects this criticism for Victoria. Wotherspoon

(1978) convincingly argues that the New South Wales pattern of trunk-line development was cost-minimising, in avoiding the need to duplicate costly crossings of the Great Dividing Range to unsuitable ports; and in allowing Sydney to achieve economies of scale and scope in freight handling. Moreover, Frost (1986) has detailed the complementarity between 'urban' developments in villages, towns and cities, and those in their hinterlands; and a strong theme in the literature is 'land hunger,' not only of immigrants but also of settled urbanites. Complementarities and land hunger could help explain the apparent 'neglect' of investment in 'amenities' in Sydney and in some other areas of concentrated population, with the exception of 'marvellous Melbourne'.

A related question is whether the political pressures led to excessive investment in country lines at the expense of urban infrastructure that offered higher net social benefits. For Victoria, Eggleston (1932, p. 204) argued that country members had sensibly required that urban investments cover their own costs, as they reasonably could. Moreover, in the most frequently cited transport case – Sydney urban rail and the long delay in the construction of the rail link to the eastern suburbs – it is arguable the required transport capability was more efficiently provided by tram, at least until road congestion made the trams' use of scarce road space prohibitively costly (Roberts 1978; Lennon & Wotherspoon 1983; Gibbons 1983).

Third, there are the freight rates themselves, their levels and their relationship to distance. Butlin (1964, p. 365) quoted Henry Cohen, Colonial Treasurer of New South Wales in 1878, to the effect that, to stimulate metropolitan business, not only had rural freight rates been lowered generally, but also the reductions had been biased to capture the Riverina trade: the rates were 'tapered' with distance. For example, in 1876 New South Wales Railways discounted the rate by 10 per cent for freight carried between 100 and 149 miles, 20 per cent for 150 to 199 miles, and 40 per cent if more than 400 miles. At least in theory, some degree of tapering can be conducive to economic efficiency, depending on how costs and demand elasticities vary with distance. Plausibly, average costs per tonne mile declines with distance because it includes a fixed terminal cost of transshipment; and the price elasticity of demand for carriage probably falls with distance (and proximity to river-based transport). However, it seems reasonable to suggest that the taper was excessive, for economic efficiency.

Finally, we offer a hypothesis: whatever the initial balance between its costs and benefits, the system that evolved from 'colonial socialism' became

ever less efficient as it collided with the formation of strong labour and country parties. It offered those forces ample grounds for institutionalised rent seeking – indeed, the risks were already apparent in the 1890s. It is telling, for example, that Edmund Gerald FitzGibbon, the able first chairman of the Melbourne Metropolitan Board of Works, reversed his support for the expansion of the Board's own labour force in 1891 (rather than day labour or contracting out) due to fear it would make the Board unduly vulnerable to industrial disputes and union pressure. Equally striking, though largely forgotten, is the Irvine government's 1903 *Constitution Act* that created a separate roll and parliamentary representation for public servants and especially railway employees in an effort to dilute their political influence.

Conclusion

The Australian colonies evolved a government-centred model of infrastructure provision that was novel and – by the standards of the times – reasonably effective in supplying a broad range of infrastructure services. We have argued that while the state's initial predominance may have been fortuitous – reflecting the crowding out of private infrastructure efforts by the gold rushes – there was nonetheless a logic to the model's development and eventual survival.

The model met four requirements: economic viability, administrative feasibility, political value and intellectual respectability. While hardly capable of yielding an economic optimum, the model secured real efficiencies – in value capture and access to world capital markets – both in absolute terms and compared to alternatives: it was to that extent economically viable. At the same time, it proved administratively feasible, especially once the statutory authority form of provision was understood and consolidated. Additionally and importantly, it adapted to changing modes of political competition – competition based on patronage and clientele initially, and then, as constituencies became larger and better educated and as the party system formed, based on rivalrous programs for the supply of local public goods. Last but not least, it had a measure of intellectual respectability – indeed, increasingly so as the new liberalism and Fabianism emerged.

Overall, the system embodied a viable political bargain, and could serve as a ready solution to be applied in new areas. But as North has put it, 'political markets are far more prone [than economic markets] to inefficiency. The reason is straightforward. It is extraordinarily difficult to measure what is being

exchanged in political markets and in consequence to enforce agreements' (North 1990, p. 362). It is our contention that as the political context changed, particularly after Federation, the initial bargain evolved in ways that created and entrenched inefficiencies. Examining those changes and their consequences is an agenda for future research.

Urbanisation

LIONEL FROST

Introduction

Hannah Binks was aged 24 when she married a signwriter named Albert Collier in 1898. They rented a semi-detached, single-storey brick cottage at 13 Turner Street, Abbotsford, owned by a Mary Tod, who leased it through a local agent, J. J. Casey. Built in 1886 at the height of the Melbourne land boom, on land subdivided in lots that were 33 feet wide and 132 feet deep, the house had a frontage of 17 feet (City of Collingwood 1907–10). A 1901 map, used to plan the building of sewers, shows the area to be mostly residential, with a couple of small boot and shirt factories nearby. Cable trams ran along nearby Johnstone Street, where there were open drainage channels and crossing points for pedestrians. Less than half of the north side of Johnstone Street was built on and there were several vacant lots in Turner Street (Melbourne and Metropolitan Board of Works 1901). The Colliers' house was of two main rooms, with a kitchen at the rear. It is likely that the house had no inside tap and almost certainly would have had no hot water. A lean-to washhouse doubled as a bathroom. There was a pan toilet near a back laneway. The area under the roofline was less than 93 m² (10 squares). By the time the family moved to a bigger house in 1909, Hannah had given birth to seven children. The three babies probably slept in the same room as their mother, while four older children – all boys – slept with their father.

Hannah's was a story that was played out, in differing circumstances, by millions of people who have been born, migrated to, lived and died in Australian cities. Hannah was born in Castlemaine; Albert's father was brought to Australia by his mother during the gold rush in 1852 and his mother was an immigrant from Ireland. The Colliers made a home in Abbotsford and were a respectable working-class family (Frost 2005). Their housing was adequate, even aspirational by the standards of the late 19th century. Thirty years later, housing reformers would have judged the same house to be overcrowded,



Figure 11.1 13 Turner Street, Abbotsford

Source: Lionel Frost.

possibly unfit for habitation, and its occupants vulnerable to moral decay (Darian-Smith 2009). Most of the original houses in Turner Street stand today, including Number 13, modernised with a rear extension that was built in the 2000s. Abbotsford's local manufacturing firms have gone, but the suburb thrives in a post-industrial era, offering housing in former worker cottages and converted buildings close to the centre of Melbourne. While the land and capital of such places passes through different hands and has been

used in ways that are shaped by economic, social and technological change, the ability of cities to create wealth through productivity-raising activities endures. Economies of scale reduce production costs, while the generation of agglomeration economies, derived from bringing workers with valuable and diverse skills together, allows knowledge to be created and spread through random formal and informal contacts (Marshall & Marshall 1881).

‘One way or another’, observe Alison Bashford and Stuart Macintyre in their introduction to *The Cambridge History of Australia*, ‘almost everything about the history of the Australian colonies was about land’ (Bashford & Macintyre 2013, p. 3). As in other regions of recent white settlement, Australia offered opportunities for landownership that were not available in Europe, and access to, and alienation of, Crown land was an important political issue. Land abundance was seen by politicians and philosophers as a precondition for the emergence of a self-sufficient yeoman society. The colonists, however, saw land as a resource that would allow them to participate in global markets, through the sale of primary products and the purchase of newly available consumer goods. This market-oriented attitude was part of an ‘industrious revolution’, a set of changes that unfolded from 1650 to 1850 in the ways in which households in Northwestern Europe and British North America allocated time (De Vries 2008). As households chose to increase the share of their production that was sold to others, through specialised agricultural and proto-industrial production, and participation in labour and service markets, the share of household consumption that was purchased from others also increased. Market activity takes place most efficiently in an urban setting, where more complete information, with institutions that reduce transactions costs, is available than would be the case if buyers and sellers meet on a one-to-one basis. The exploitation of Australia’s rural land as a source of wealth by primary producers, and the building of towns where markets and services were located, and production inputs and consumer goods were manufactured, occurred simultaneously as part of the same process. The city and its hinterland were ‘intimately linked’ and ‘neither was possible without the other’ (Cronon 1991, p. 264).

Public and private choices about urban land use may be sensitive to initial conditions that exert a lasting impact in a path-dependent way. Street layouts, public spaces and lot sizes specified in town plans will have continuing effects on the supply of land for urban use. The availability of fresh water, waterways for the disposal of waste, flat building land, and the depth of harbours and waterfronts will affect the costs of doing business in a particular urban location. Town sites with advantages for trade are likely to attract ongoing

investment in commerce and infrastructure as the volume of trade increases. At the same time, such advantages may also give rise to problems of drainage and waste disposal that are difficult to solve. When resources become scarce, efficient markets send signals to buyers and sellers in the form of rising prices, which are likely to encourage conservation of the resource and the development of substitutes. Thus, if a city's population grows faster than its stock of housing and social overhead, rising rents will encourage a reduction in per capita housing space and a deterioration in the quality of the urban environment. Rising costs provide natural limits on rates of urbanisation that prevent cities from growing 'too fast' (Williamson 1990), but markets may not work effectively if migrants act on imperfect information about job opportunities, flooding the urban labour market and forcing wages down. If the legacy of past urban development constrains the work of planners and policymakers, underinvestment in urban infrastructure may create unhealthy environments that reduce labour productivity and quality of life. The concept of market failure is implicit in several case studies of Australian urban poverty, slum housing and pollution.

This chapter is divided into three sections. The first provides a sketch of the key features of Australian urbanisation. The second and third examine key issues that have been explored in the literature – the relationship between the growth of cities and their hinterlands, and the use of planning to improve the condition of cities.

The contours of Australian urbanisation

After Captain James Cook completed his exploration of the Pacific Ocean in the 1770s, independent British and American merchants and hunters ranged over a free-trade, borderless waterscape in pursuit of commercial opportunities (Igler 2013). Sealers and whalers called at Sydney and Hobart for repairs and provisions, and to hire crews. Until Governor Macquarie ordered the building of a road over the Blue Mountains, which resulted in the founding of Bathurst in 1815, the convict settlement at Sydney was home to more than half of the total Australian population (Table 11.1). A highly profitable wool industry, based on low production costs and high export demand from Britain, developed from 1820 onwards when pastoralists moved stock to the grasslands west of the Blue Mountains. The arrival in Hobart of increasing numbers of ships carrying free settlers triggered Australasia's first economic boom in 1828, but the best farming and pastoral country in Van Diemen's Land (present-day Tasmania) was occupied quickly (Belich 2009). In 1833 Lieutenant-Governor

Table 11.1 Population of Australia's five largest cities and the cities' share of Australian population (%), 1810–2011

	Sydney	Melbourne	Adelaide	Brisbane	Perth	Share of Australian population
1810	6	n/a	n/a	n/a	n/a	52
1828	11	n/a	n/a	n/a	n/a	19
1841	30	4	8	n/a	n/a	23
1851	54	29	18	3	n/a	16
1871	138	191	51	15	n/a	24
1891	400	473	117	94	16	35
1911	648	593	169	141	107	36
1921	899	767	255	210	155	42
1947	1484	1226	382	402	273	50
1971	2725	2408	809	870	731	58
1991	3538	3022	1024	1334	1143	58
2011	4606	4169	1263	2147	1832	63

Sources: ABS census data (various years); Butlin (1994), p. 153.

George Arthur attempted to persuade the British government to extend the colony to the Port Phillip District, on the southern coast of the mainland. When rival syndicates headed by businessmen from Launceston established a camp on the banks of the Yarra River, where Melbourne would be sited, it signified that 'the continent was fully opened to conquest' (Boyce 2011, p. xi). Because Tasmania's richest land and mineral deposits were located to the north of the island, Hobart's population stagnated while Launceston became the colony's commercial capital (Davison 2006). A third convict outpost was established, at Brisbane in 1825, while private companies settled the Swan River colony (and its capital city, Perth) in 1829 and the South Australian Company (and its capital city, Adelaide) in 1835. In the early 1850s, Melbourne, the entry port to the Victorian goldfields, was the fastest-growing city in the world (Davison 2001, p. 52). Although Sydney lost its position as Australia's largest city during the 1850s, its population continued to grow strongly, as did that of Adelaide, the capital of Australia's major wheat-growing colony.

From the 1860s onwards, land legislation in each of the colonies made Crown lands that had hitherto been used as large pastoral estates available on credit for small family farms (Greasley, this volume). Railway networks supported mining, wheat growing and dairy manufacturing by improving access to markets and reducing production costs, and gave metropolitan merchants and manufacturers cost advantages over small-town competitors. With the

exception of Perth, which was stimulated by the gold rushes at Kalgoorlie–Boulder, the capital cities grew more slowly during the depression of the 1890s. A growing export trade in dairy products and frozen meat assisted the economic recovery. In the 10 years before World War 1, rising international prices and improved technology encouraged further clearing of land for wheat farming. The expansion of primary production was to the advantage of the capital cities, but also created jobs in small towns that met the service needs of nearby farmers. By 1911 almost two out of every three Australians lived outside the nation's five largest cities.

The coincidence of the 'industrious revolution' with white settlement influenced Australian patterns of production and consumption throughout the 19th century. To meet expectations that the penal settlements at Sydney and Hobart would become self-sufficient, colonial governors established free markets for land and labour. Archaeological sites in Sydney reveal that convict workers embraced consumer culture, buying cotton fabrics, fashionable clothing, ceramics, glassware, buttons, shoe buckles, hats and books (Karskens 1999). 'Store-bought food was replacing homemade and they drank tea, once the preserve of the rich, with great gusto' (Karskens 2009, p. 65). Australia's per capita GDP was higher than that of Britain by 1860, and would remain so until the depression of the 1890s (McLean 2013, p. 12). Efficient farming reduced food prices in the cities – the wholesale price index for groceries in Melbourne (1911 = 100) fell from 196 in 1861 to 103 in 1891 (Vamplew 1987, p. 215) – which shifted consumers' budget lines, allowing them to consume at higher levels of utility. Daily per capita meat consumption in Australia averaged 318 grams in 1900, compared to 136 grams in Britain (Frost 1991, pp. 72–3). Australians consumed a third to a half less beer than their British counterparts, preferring tea as a thirst quencher (Dingle 1980, p. 243). Food was the largest item by far in European working-class budgets, and a British unskilled worker earning around 20 shillings in a full week of work would have only 8 shillings available for non-food expenditure. In Australian cities food accounted for around 33 per cent of working-class household budgets, and the average wage for unskilled work (42 shillings) provided a disposable income of 28 shillings (Frost 1991, pp. 73–4). Insolvency records suggest that the retention of household items such as a dining table, laundry tubs, flat irons, bed linen and sets of 'Sunday best' clothing reflected contemporary values about what constituted 'decencies of living' (Young 1992).

A revealed preference for comfortable housing space, and a flexible supply response from the building industry, is evident in the growth of the urban housing stock, in terms of both the number of rooms and housing units per

capita (Butlin 1964; Brown 2000). In Melbourne and Adelaide, people bought or rented new houses and supported public investment in modern sewerage infrastructure, even though cheaper housing and labour-intensive methods of waste disposal were available (Frost 1991; Mein Smith & Frost 1995; Merrett 1977). Galvanised iron roofing, prefabricated joinery, machine cutting and dressing of timber, and mechanised brick production reduced construction costs. Cottages in working-class suburbs reproduced, in cheaper materials and reduced dimensions, the villas found in middle-class suburbs. Builders who emigrated to Perth in the 1890s took knowledge of these styles and techniques with them.

The low-density suburbia that characterised Melbourne, Adelaide and Perth did not develop to the same extent in Sydney and Brisbane until after World War I, due to planning and institutional obstacles (Frost 1991). Located on a cramped site at Sydney Cove, where fresh water was close by, Sydney began as a rough camp and grew anarchically. Governor Phillip drew up a plan with 200 feet wide main streets, but this was never implemented. Streets were formed between cottages and other buildings following Aboriginal tracks (Karskens 2009; Freestone 2010). Subsequent governors attempted to impose regularity to the town – the grand street named after Lachlan Macquarie, linking the harbour to Hyde Park was a notable success – but hilly terrain made it difficult to plan thoroughfares. When Sydney's first railway was built in 1855, the town was so built up that the terminus was located at Redfern, 15–30 minutes' walk from city workplaces. A network of steam-powered trams was built, but these were slow and unpopular, and ill suited to crooked streets. Brisbane's main streets were half the width of Adelaide's and its grid was hemmed in to the south and east by the Brisbane River (Freestone 2010, p. 111). Roma Street station, opened in 1874, was within walking distance and this encouraged the development of middle-class suburbs along trunk lines in the 1880s (Lawson 1973). Melbourne, Adelaide and Perth's inland freshwater sites made early rail links with their port towns a necessity, while open ground at the edge of their city grids provided space for terminuses. Private tramways – horse-drawn at first and later, in Melbourne, cable-driven – operated efficiently on wide, generally flat streets. While the Victorian and South Australian parliaments were dominated by metropolitan interests that supported the construction of railways to encourage the sale of suburban land, country-based members who preferred to invest in rural railways held sway in New South Wales.

The Australian economy was reshaped in the interwar period by a series of supply- and demand-side changes that shifted resources from rural and

mining activity to manufacturing. The tertiary sector maintained its position, providing just over half of jobs and GDP. Merrett and Ville (2011) conclude that changes in the relative profitability of industries, rather than tariffs and subsidies, accounted for this structural change. The Broken Hill Proprietary Company Limited (BHP) opened its steelworks at Newcastle in 1912 and in 1935 acquired Australian Iron and Steel to move to Port Kembla, near Wollongong, providing raw materials for construction and steel-using heavy industries (Cushing 2009). Large-scale public investment in electricity generation and transmission expanded production possibilities in manufacturing, offices and retail trade. Firms responded to price signals and changing cost functions by increasing the supply of cars, washing machines and other products that saved time, and products and venues such as radios and cinemas that created new uses for leisure time. These were normal goods, the demand for which was increased by rising incomes. Demonstration effects and advertising also increased demand. Department stores, operating from lavish buildings in the capital cities, drew trade from country and suburban competitors through personal or mail order shopping (Wolfers 1980). Manufacturing firms benefited from metropolitan locations, which offered economies of scale and proximity to customers and labour supplies. Public capital formation, in urban roads, bridges and sewerage systems, was also to the advantage of large cities (Sinclair 1970). During World War 2 the capitals activated latent resources by directing labour and capital to the manufacture of weapons and supplies (Darian-Smith 2009). Commodity prices declined after 1914 as more land was brought into production worldwide, but in Australia the supply of farm land was inelastic, as most of the land that was capable of supporting a rural population was already being used (Frost 2008). The total population of the five largest capital cities grew by almost 1.4 million between 1921 and 1947 (Table 11.1), mostly as a result of natural increase and intra-state migration (Merrett 1978).

During the post-World War 2 economic boom, the capital cities continued to act as magnets for jobs and people. A program of assisted immigration and a postwar rise in marriage and birth rates provided both consumers and a labour supply for the manufacturing sector. Australia's population rose by almost 3 million between 1947 and 1961, with the capital cities providing two-thirds of the increase. Overseas migration accounted for 40 per cent of the capital city's population growth; the figure was 47 per cent for Melbourne and Adelaide (where state government policies stimulated the expansion of industry and public housing) (Merrett 1978; Marsden 1986). Postwar housing shortages were overcome by the mid-1950s, despite rising costs and shortages

of building materials. Austere building styles, the reduced dimensions of houses, self-building by owners and government subsidies increased the rate of home ownership (Boyd 1978; Frost & Dingle 1995b; Dingle 2000; Stapledon 2012). Firms moved to 'greenfield' sites with space for large, single-storey factories and warehouses. Vacant land in between railway lines was filled in with factories and suburbs, as trucks and car ownerships gave firms and people more flexibility in distribution and commuting. Provincial cities and country towns also prospered in the 1950s, as wool and wheat prices boomed and cheap land attracted new industries.

In the last quarter of the 20th century, exogenous forces of deindustrialisation and globalisation influenced the spatial and economic structure of Australian cities. Old inner-city industrial and dockside areas that were built to handle the processing and distribution of products were transformed by the development of new industries whose core business was the processing and distribution of information. They were also gentrified by the conversion of factories and warehouses into apartments and the refurbishing of old housing, in locations of mixed land use that are conducive to face-to-face interaction (Gregory 2008; Dingle & O'Hanlon 2009; O'Hanlon & Sharpe 2009). New retailing and office jobs were created close to main roads and suburban housing, many of them on sites that were largely rural in character during the 1970s. Freeway-led suburbanisation of housing and jobs resulted in the merging of coastal towns with metropolitan Brisbane to form a megalopolis stretching 200 km from the Sunshine Coast to the Gold Coast (Spearritt 2009).

Industrial towns and districts, mining towns and towns serving farming regions were vulnerable to these changes due to their dependence on resource-based or manufacturing activity, low incomes and a lack of transferable skills. But not all such towns declined – the total population of Newcastle, Wollongong, Geelong, Townsville, Cairns, Launceston and Mildura grew by 42 per cent between the censuses of 1976 and 2001 (ABS 2004). In a post-industrial economy locations are advantaged by accessibility to shopping, educational and health-care services, parks, beaches and other amenities, which create jobs. Remote places are generally disadvantaged. Ninety per cent of Australia's total population growth between 2001 and 2011 took place in, or within convenient driving distance of, capital cities, high-amenity coastal regions and inland provincial towns (ABS 2012a; Hugo 2005). Almost 20 per cent of Australia's population now lives in urban areas outside capital cities (Daley & Lancey 2011). Outside these growth regions, population declined in New South Wales, Victoria and South Australia due to continuing

job losses in the wheat–sheep belt in those states. Most population growth in remote regions was the result of the mining boom in Western Australia and Queensland.

The cities and their hinterlands

The issue of whether cities have been ‘too large’, with their growth diverting scarce resources from potentially more productive uses, has been a major theme in the literature on Australian urbanisation. The perception that cities exerted a negative influence on the economy, by consuming rather than producing wealth and diverting resources from rural development, was widely held by contemporaries in the 19th and 20th centuries. Reports of poverty, disease and crowded housing implied that city populations had grown faster than the number of jobs or the level of social overhead capital. This theme has been developed in several modern studies, most of them relating to Sydney’s built environment (Fitzgerald 1987; Wotherspoon 1978). The argument that Australia’s major cities dominated their hinterlands to an unusual degree, however, is difficult to sustain. As commercial cities, created for the identical purpose of serving the needs of the capitalist world economy, Australia’s capital cities resembled closely the commercial cities of other settler societies. The Australian economy was highly urbanised from the outset, and by 1891 the share of the population living in towns of at least 2500 inhabitants was 49 per cent – larger than the United States figure of 36 per cent (Table 11.2). In California – the region most similar to Australia in terms of initial conditions and record of subsequent growth – the urban share of the total population in 1890 was 48 per cent. San Francisco dominated the Californian economy to a similar extent as Sydney did New South Wales and Melbourne did Victoria (McCarty 1970). As the home of the monopolistic Southern Pacific railroad and a class of large rural landholders, San Francisco, like Sydney and Melbourne, was seen by contemporaries as ‘a gigantic parasite fattening upon the life-blood of an entire commonwealth’ (quoted in Frost 2010). In regions with narrow hinterlands, such as California and Victoria, small to medium-sized cities were less likely to contribute to urban growth than in regions with larger and deeper hinterlands, such as Buenos Aires province (Argentina), New South Wales and Queensland (Table 11.3). As McCarty (1970) observed, in terms of the distribution of population between urban and rural sectors, and in the relative size of primate cities, Australia’s experience was far from exceptional.

Table 11.2 Urban (towns of 2500 or more inhabitants)
percentage of total population, 1851–1911

	Australia	Argentina	Canada	New Zealand	USA
1851	40	n/a	12	n/a	14 ⁴
1871	37	26 ¹	n/a	28 ³	26 ⁵
1891	49	n/a	n/a	38	36 ⁶
1911	56	51 ²	37	49	46 ⁷

Notes: 1869¹ 1914² 1874³ 1850⁴ 1870⁵ 1890⁶ 1910⁷.

Sources: ABS census data (various years).

Commercial cities were points of interaction between trading nations and grew by integrating the smaller inland cities and primary producing regions of their 'inland empires' (Meinig 2005). In Australia, pastoralists who were time-poor and working from isolated homesteads relied on stock and station agents to get the best prices for wool and livestock and to arrange shipping and insurance (Ville 2000). Successful wheat growers developed a broad-acre farming system based on quick clearing and cultivation of land that had been selected on credit (Fahey 2011). At harvest time, merchants and millers were waiting at railway stations and sidings, offering to buy grain at the current price. Throughout the wheat belt, half a dozen large firms employed agents who canvassed farmers to arrange sales while crops were ripening, providing cash advances with the balance to be paid after the wheat was sold (Whitwell & Sydenham 1991, pp. 36–9). After visiting Shepparton in 1884, the journalist John Stanley James ('The Vagabond') wrote that in the harvest season the town 'is said to resemble a fair. The streets are thronged with people, the roads crowded with drays loaded with grain en route to the railway depot' ('The Vagabond' 1884, p. 4). As Glaeser (2011) observes, in the 19th century big clipper and steamships docked at major ports, as big passenger jets land at international airports today. From there, cargoes and passengers were transferred to coastal shipping or railways for transport to a final destination. This hub-and-spoke pattern of distribution was established by the geography of natural harbours and locations of political power. In doing so, they created jobs in shipping, service industries and the commercial and manufacturing industries located near the harbours, waterways and railways. The profits from trade and resource extraction financed the construction of public works and private buildings (Martland 2008).

In each of the commercial cities, flat land close to harbours and waterways was at a premium. If needed, cities increased the supply of it by infilling

shorelines to deepen harbours, levelling hills and digging cuttings. River banks were magnets for industries that needed water for steam engines and processing and a ready means of disposing of wastes, such as foundries, lumber yards, flour and saw mills, breweries, meatpackers, tanneries, fertiliser plants, gas works, and shipbuilding and repair firms. Housing in low-lying districts was vulnerable to flooding from open drains and inadequate sewers, but offered low rents and was within walking distance of large markets for unskilled labour (Barrett 1971; Fitzgerald 1987; Rosenthal 1995; Pineo 1998; Davison 1978). At the end of the 19th century, 80 per cent of San Francisco's labourers lived no more than half a mile from where they worked, while 86 per cent of Sydney's population lived within walking distance of Sydney Cove (Frost 1991, 2010). More desirable residential areas for commuting skilled blue-collar workers, clerks and professionals were separated from the city centres and dockside and industrial districts by ferries, railways, horse-drawn streetcars and later cable and electric streetcars (Scobie 1974). This spatial organisation allowed people to benefit from agglomeration economies and the external effects of the accumulation of human capital (Frost 2010).

Commercial cities differed fundamentally in two ways. First, while high demand for unskilled labour was a generic feature of these cities, average incomes varied between cities due to differences in the elasticity of labour supply. High travel costs to frontier cities in Australasia and North America had a negative impact on rates of migration, but these were partially offset by the wealth of those who could afford the fares and were able to live off their savings while the journey was made. Relatively skilled workers with expectations of holding good-quality jobs were the most likely group to migrate, and while frontier cities yielded little upward occupational mobility they provided high wages. These conditions reflected the labour force growing more slowly than the capital stock, and the impact of immigration on the demand for labour, as migrants spent their savings and wages on housing and other products (Withers 1977). The supply of immigrants to Argentina, with its cultural links to low-wage Spain and Italy, was more elastic. During the economic booms associated with the development of refrigerated shipping and increased wheat acreage, wages in Argentina were two to three times greater than those in Spain and Italy. The net inflow of overseas migrants to Argentina was 1.5 million in the 10 years prior to World War I (Taylor 1992a). Buenos Aires grew from 180 000 to 1.5 million inhabitants during the Belle Époque, while Rosario, the port close to the best wheat land, grew from 23 000 to 220 000 (Scobie 1964, pp. 106, 133). In four of the 20 years after 1890, the average Argentine real wage exceeded that of Britain (Williamson 1995).

However, Taylor (1997, p. 125) calculates that between 1870 and 1914 the overall effect of immigration was to dampen the growth of real wages. Australian real wages were on average 29 per cent higher than those of Argentina in the five years before World War I (Williamson 1995, pp. 165–6).

Second, the quality of the built environment varied between commercial cities, as people maximised utility from housing markets within their budget constraints. Australia faced a housing shortage at the end of the gold rush, with one-fifth of the population living in tents and other impermanent structures in 1861 (Butlin 1964, pp. 215–17). In rural and goldfields areas, simple and easy to build miners' cottages eased housing shortages (Dingle 2010). In the cities, a housing stock of vastly improved quality expanded to meet population growth and people opted for roominess and amenities rather than cheaper houses. In 1905 a skilled worker in Adelaide could rent a three- or four-room cottage in the industrial suburb of Thebarton that would have been constructed during the building boom of 1875–82. Instead, such workers were more likely to buy a new five- or six-room, double-fronted house at Unley, Malvern or Goodwood, pleasant commuter suburbs that were linked to the city by railways and trams at the suburban edge (Mein Smith & Frost 1995). Older housing was more likely to be tenanted, occupied and in many cases shared by lone women, such as widows and unmarried mothers (Mein Smith & Frost 1994). By contrast, skilled workers who moved to new suburbs in Buenos Aires after the horse-drawn streetcar network was electrified in 1900 could generally only afford to buy a block of land, often on a flood-prone area. After making a down payment, using credit from a building society or loan companies, a family could occupy the site, and on Sundays and holidays provide sweat equity by self-building a one-room house, of perhaps 180 square feet. Extra rooms were added later. A family with a husband, wife and teenaged children in work could expect to own a home within 10 years (Scobie 1974). As in Montevideo and Valparaíso, the Buenos Aires professional and upper-middle class elite chose to live in grand houses close to the city centre, but for humbler folk a central location meant living in a *conventillo*, a dark, multifamily tenement building (Rosenthal 1995; Pineo 1998).

In *Argentina: A City and a Nation* (1964), James Scobie wrote that the evolution of Buenos Aires explains much about the economic development of Argentina. Demand for agricultural labour declined due to mechanisation and the consolidation of larger farms. The transiency of the lives of tenant farmers and seasonal migrant workers, and the absence of strong communities in small towns drained most immigrants to Buenos Aires, where jobs, educational facilities and social contacts were greater. In fact, Buenos Aires

Table 11.3 Selected regions of recent white settlement: share of urban population growth provided by cities of 2500 to 40 000 inhabitants (%)

Argentina (1869–1914)	42
New South Wales, Queensland (1851–1911)	36
British Columbia (1881–1911)	33
New Zealand (1874–1911)	33
California, Oregon, Washington (1860–1910)	22
Victoria, South Australia, Western Australia (1851–1911)	18

Sources: ABS census data (various years).

was a relatively less dominant capital city than its Australian counterparts. In 1914 Buenos Aires had more inhabitants than Sydney and Melbourne put together, but Argentina's population was almost double that of Australia. Buenos Aires accounted for 22 per cent of Argentina's population growth since 1870; Sydney and Melbourne accounted for 32 per cent of Australia's population growth. Cities of less than 40 000 inhabitants provided 42 per cent of Argentina's population growth (Table 11.3); in Australia the figure was 27 per cent (Frost 1991, p. 46).

The distribution of land in Australia was more egalitarian. A dense network of towns, most of no more than around a thousand inhabitants, placed urban amenities within a short drive (by horse and cart) of most farmers, rural labourers and miners. These towns offered a wide range of stores, commercial and professional services, prosperous local manufacturers and vigorous civic, sporting, social and cultural institutions. Storekeepers made credit available to farmers. Mechanics Institutes or Schools of Arts – more than a thousand were founded throughout Victoria during the 19th century – provided technical education for crafts and trades and meeting places for community groups (Myers 1999). Farmers discussed common problems in towns, informally in social situations and through forums such as agricultural societies, with new information being disseminated by local newspapers throughout Australia (Frost 2001). Successful businesspeople from provincial towns, such as Sidney Myer, a former commercial traveller who ran a store in Bendigo, and H. V. McKay, a harvester manufacturer from Ballarat, moved to the capital cities to widen the scale of their operations (Pratt 1978; Lack 1991). While surplus rural labour in Argentina was drawn to Buenos Aires, in Australia unskilled labourers who took seasonal farm and shearing work tended to live in country towns (Buxton 1967). The persistence of wage

gaps in favour of urban over rural unskilled workers, even after allowance is made for higher urban housing costs, indicates that Australian capital cities were not flooded with low-income immigrants or surplus rural labour (Frost 1998). This is consistent with the British experience during the Industrial Revolution, where high urban wages were a premium to encourage workers to migrate to and remain in towns where living costs were high and conditions were unhealthy (Williamson 1990). Research into urban and rural disposable incomes may reveal that Buenos Aires, like other commercial cities, in fact grew too slowly to reduce wage costs and encourage investment in manufacturing.

Improving cities

Jack Fitzgerald, a barrister and trade union official and one of the founders of the Australian Labor Party, served as an alderman of the Sydney City Council from 1900 to 1904 (Nairn 1981). In 1907, Fitzgerald wrote of the ‘tangle of competing and incompetent civic, governmental and private authorities’ that had left Sydney as ‘a city flung down in a crazy mass, formless, inorganic, a maze of slums’. In calling it ‘The Cinderella of Cities’, ‘covered with soot and grime, slovenly and out-at-heels, bedraggled and neglected’, Fitzgerald sought ‘to preach civic reform for all Australia’, with Sydney used as ‘the shocking example’ (Fitzgerald 1992, pp. 205–6). Sydney was not the only Australian capital city to enter the 20th century with a legacy of weak, fragmented municipal government and unregulated inner-city development (Dunstan 1984; Barrett 1971), but in a broad survey a case study of the links between governance and improvement in the urban environment is appropriate.

The incorporation of the City of Sydney in 1842 was a product of the British government’s desire to cut its expenditure in maintaining the town, rather than any local desire for civic improvement (Coward 1988; Fitzgerald 1992). The colonial government allocated administrative tasks to the Corporation but was reluctant to transfer legal powers and resources. The Corporation was allowed to levy direct rates on property. Thus, when water was reticulated from a bore built by convicts in the 1830s to standpipes throughout the city, the Corporation was cautious about connecting houses to the mains because it did not have the funds to develop new water sources. Until the opening of the Upper Nepean Scheme in 1886, piped water flowed intermittently and was of variable quality (Clark 1978). Under the *Sewerage Act* of 1850, Council was required to build sewers but could borrow a negligible

sum to do so and could only levy sewerage rates on households that chose to connect to them. There was a general resistance from tenants to pay for urban services that they could provide themselves. Rubbish removal was a Council responsibility but in The Rocks people preferred to sweep waste under their floorboards or dump it in cesspits rather than pay collection fees (Karskens 1999, pp. 86–90). Building regulations, modeled on the London Building Act, required construction in non-flammable materials, but these applied only to the central city and timber remained the most common building material in outlying areas such as Surry Hills and near Darling Harbour (Fitzgerald 1992, pp. 25–41). New suburbs that were within commuting distance by ferry, tram or railway were developed successfully, but public transport was too expensive and inconvenient for most workers (Kelly 1978; Prescott 1983). In response to rising land values in the City of Sydney, landlords built cheap shelter in the backyards of original houses, linked by narrow lanes to the main streets. The Council demolished some of the City's worst housing in the 1880s, but the process was halted during the depression of the 1890s. By 1900 the City's residential districts were blighted by old, poor-quality housing, regular flooding and problems associated with nearby sewer outlets (Fitzgerald 1992, pp. 208–15).

In 1894 an epidemic of bubonic plague broke out in Hong Kong and Canton (Guangzhou) and within a few years steamships had taken it to virtually every major port in the world (Mohr 2005). The plague killed hundreds of thousands of people in China, Southeast Asia and India, but in most developed world cities it was contained quickly with small loss of life. Where the death toll ran into the hundreds, as it did in the Chinatowns of San Francisco and Honolulu and the *conventillos* of Buenos Aires, the event was an indicator of crowded and insanitary living conditions. In Sydney, 303 people contracted the disease, most of them working men living close to the docks, and 103 were killed by it (Fitzgerald 1992, p. 215). The crisis highlighted the issues that had prevented effective responses to 'the problem of the inner city' (Fitzgerald 1992, p. 207). The Council gained the power to resume property for street widening and drainage improvement, but the demolition of housing judged to be insanitary reduced the stock of working-class housing and increased rents (Freestone 2010). Parliament acquired all municipal and private wharves from Circular Quay to Darling Harbour in 1902 and began considering plans for a bridge spanning Sydney Harbour. Central Station, approved in 1900, was completed in 1906. A 1908–09 Royal Commission for the Improvement of the City of Sydney and its Suburbs, Australia's first town planning inquiry, recommended the electrification of trams and suburban

trains, the construction of an underground rail loop, and the Harbour Bridge to clear inner-city congestion and open up new suburbs (Gibbons 1980).

In early 20th-century Australia, support for more regulated control of urban development was widespread (Troy 2012, p. 28). This coincided with the emergence of a school of reformers and town planners in Britain, France, Germany and the United States, which was inspired by Ebenezer Howard's view that the solution to the problem of urban slums lay in rehousing the poor in 'garden cities' – new, planned residential suburbs built on areas of open countryside. For proponents of the garden city, the size and configuration of lots (with no back lanes, front fences, and space for tree planting, set on curvilinear streets of varying widths and rounded street corners) created healthful 'breathing spaces' for residents. The competition to design Canberra allowed a wide range of ideas for planned development to be considered. Walter Burley Griffin's winning design incorporated elements of the garden-city ideal (Reps 1997). Daceyville Garden Suburb was planned to provide a model for future development. Built by the New South Wales Housing Board from 1912 to 1920, it offered detached housing for workers flanked by a 32-acre park (Spearritt 2000, pp. 19–20).

Sydney was already decentralising, however. The population of the City and its surrounding suburbs had virtually peaked by 1911 and in the subsequent decade outer suburbs linked by improved public transport increased their share of the metropolitan population from 28 to 58 per cent. Half of this suburban growth took place between 1911 and 1914 (Frost 1998, p. 68). World War I disrupted migration flows and diverted resources from residential construction, while federal rent controls made housing a less attractive field of investment (Stapledon 2012). The suburban boom of the 1920s, fed by postwar housing shortages, presented profit-making opportunities for developers and real estate agents. As in the other capital cities, suburban builders embraced the informal Californian Bungalow, which became the predominant housing style of the interwar suburb (Boyd 1978). Set on quarter-acre lots – approximately 1000 m² – that were large enough for a driveway and garage, houses were set back to allow trees and shrubs to be planted in front gardens. Road reservations were wide enough for councils to plant shade trees on 'nature strips' between lot boundaries and roads. At suburban railway stations, tram junctions and terminuses, shopping strips developed. People could get around them on foot or by taking public transport, and there was a marked absence of pollution and overcrowding. Beyond easy walking distance of public transport, the land generally remained undeveloped. Some suburban councils used their powers under the *Local Government Act 1919* to

regulate subdivision and building. For example, in middle-class Randwick the local council excluded industries and hotels (Kelly 1980). Such suburbs were largely a product of market-based decisions, but conformed as strongly to the ideal of the 'garden city' as any planned community did.

Hugh Stretton (1970) and more recently Andrew May (2009) have written of suburbia as the revealed preference of millions of 'ordinary' people for the comfort and privacy that owner-occupied house and garden could bring. For planners and policymakers, the growth of such suburbs entailed the consumption of space at inefficiently high levels for cost-effective infrastructure provision, and population densities that were inefficiently low for social interaction. In Canberra, the only Australian city to have all of its land vested in public ownership, the National Capital Development Commission, established in 1955, had a free hand to design and construct the urban area (Freestone 2010). The Commission's strategy for directing growth to planned neighbourhoods along urban corridors was an extension of Griffin's 1912 plan, rather than a sweeping realignment of public and private spaces, as was the case in the 1902 plan for Washington, DC (Peterson 2003). In the post-World War 2 era, when shortages of housing, deficiencies in infrastructure and a growing volume of motor vehicle traffic throughout metropolitan areas became pressing issues, state governments used planning strategies to achieve economic, social and environmental objectives by influencing the spatial structure of metropolitan regions (Freestone 2010). Through metropolitan plans, regulatory provisions about land use and investment decisions about social and physical infrastructure are used to address congestion costs and the ability of households and firms to access the resources and opportunities they need. Institutional support for suburban development and the demand for high housing standards are enduring features of Australian urban history. However, planners have not engaged with this history, nor appreciated the power of the obstacles it has created.

Australia's first statutory 'blueprint' metropolitan planning scheme was the 1948 County of Cumberland Plan for Sydney (Freestone 2010). A new authority sitting between local councils and the state government, the Cumberland County Council established green belts to control urban sprawl and plans to improve public and private transport. Implementation of the Cumberland Plan was delayed until 1951, by which time the metropolitan population was growing at twice its predicted rate. Coordination between the Council and state and local authorities was not effective. The Department of Main Roads, which favoured expressway building throughout the metropolitan area, remained at odds with the Council until the latter was abolished

in 1963. Plans to clear The Rocks for redevelopment were halted by 'green bans' imposed by the Secretary of the New South Wales Builders Labourers Federation, Jack Munday. Plans for further inner-city expressways were abandoned by the state government in the 1970s (Spearritt 2000, pp. 152–3, 240).

In the early 1980s, Australian state governments, in keeping with neoliberal policy agendas, pursued policies aimed at efficient urban infrastructure provision by increasing population densities close to public transport and reducing the size of new housing lots. Troy (1996) argues that the rationale for consolidation policies lack empirical support and underestimates the environmental, economic and social advantages of traditional low-density forms. The average floor area of a new Australian house is 243 m² (26 squares), 10 per cent more than its American counterpart and an increase of 40 per cent since 1990 (Johanson 2011). The narrow 'green streets' approved by councils in many new estates have little room for parking or service vehicle access. Shrinking the size of lots reduces space for gardens. In the early 21st century, planning authorities have sought to direct jobs and population growth within metropolitan Sydney to established areas within an urban growth boundary that is well served by road and rail. The transformation of urban environments remains a contested process, with the ability of state governments to address housing shortages and congestion costs dependent on governance arrangements that engage and link citizens, community organisations and local governments.

PART 4



A NATIONAL ECONOMY

Capital markets

RODNEY MADDOCK

Introduction

Capital markets describe the set of arrangements that match borrowers to lenders. Sometimes the arrangement is direct, sometimes it takes place through an intermediary like a bank, and sometimes it takes place through a market like the stock market. This chapter deals with such external financing of expenditure in Australian history while noting that governments, households and businesses also finance much of their expenditure internally.

Australia has seen major swings in borrowings over 200 years. Government debt grew from nothing in the 1850s to 100 per cent of GDP within 50 years, and then to more than 200 per cent of GDP within the next half-century. Following World War 2, governments cut their debt to virtually zero over the subsequent 40 years. Households borrowed massively at the end of the 19th century, as part of a property bubble that collapsed and caused a deep recession. For most of the subsequent century, relative to GDP, household debt was low, but rose to exceed all previous heights following financial liberalisation in the 1980s. Corporate borrowing's most notable swing was an effective doubling soon after financial liberalisation, and it too was followed by a crash and the write-down of much debt. Companies have increasingly used stock markets to raise capital.

Why have we seen these patterns? Borrowing reflects a choice by economic agents and implies that they can better use the funds immediately, for investment or consumption, rather than by waiting. This explains borrowing to build a house, construct a railway or finance a war. Lending also reflects important choices, most particularly that better profit can be had by waiting rather than spending. Savings by Australians have financed much of the fluctuating demand; however, they have also borrowed heavily from global markets. Sometimes, as in the 1880s or mid-2000s, Australia has been a preferred recipient of a surplus of savings for global markets looking for a place

to invest; there have been other periods, as in the 1920s and in recent years, when Australians have been keen to borrow but have found borrowing more difficult.

This chapter proceeds chronologically. It breaks Australia's financial history into periods that have a distinctive and dominating theme.

Historiography

Most of the major financial intermediaries have received extensive treatment in the literature. S. J. Butlin (1953, 1986) provides a magisterial survey of the period to 1914. This is complemented by histories of the four major banking entities: Australia and New Zealand Bank (S. J. Butlin 1961; Merrett 1985), National Australia Bank (Blainey & Hutton 1983), Westpac (Holder 1970; Carew 1997) and the Commonwealth Bank of Australia (Giblin 1951), and for the largest insurer, the AMP (Blainey 1999). Central-banking histories include Giblin (1951), Schedvin (1992) and Cornish (2010). A key source of data is Butlin, Hall and White (1971), Pope (1986) extends and deepens the series, while Vamplew (1987) conveniently collects many of the basic statistics.

Of the more specialist institutions, the pastoral finance houses are analysed in Barnard (1958) and Ville (2000); building societies in Thompson and Abbott (2010); insurers in Keneley (2001, 2006); and stock exchanges in Hall (1968), Loughheed (1984), Salsbury and Sweeney (1988), Were (1954) and Carew (2007). Appleyard and Schedvin (1988) provide biographies of major personalities.

Australia's linkages to global capital markets in the period to 1914 are surveyed in Davis and Gallman (2001). Chabot and Kurz (2010) and Jordà, Schularick and Taylor (2011) provide international historical studies that encompass Australia, and S. J. Butlin (1987) provides an overview of 20th-century finance. Schedvin's (1970) survey of the Great Depression is very helpful. The Reserve Bank of Australia has provided a number of decade-long views, such as Gruen and Shrestha (2000), Davis (2011) and Kearns and Lowe (2011); comparative studies of the depressions (Fisher & Kent 1999); and surveys, such as Fitz-Gibbon and Gizycki (2001) and Black et al. (2012).

Building an appropriate financial system

Over the period 1788–1860 Australia developed a financial system well adapted to its economic structure. Literally starting with nothing, colonial governors bent rules and investors adapted, as the command economy was gradually replaced by one that depended on land sales and wool exports, and then

accommodated the massive shock of the gold discoveries, with relatively few problems.

While founded as a command economy, the settlement quickly developed a parallel market economy. This caused difficulties since there was no formal means of payment. Both government and private notes quickly filled the gap and a diverse range of coins was used. Barter was also used extensively, as S. J. Butlin (1953, p. 93) relates: 'the road from Launceston to Norfolk Plains cost the government one cow'. Governor Macquarie from the beginning of his tenure (in 1810) appreciated the advantage of having banks to facilitate the flow of payments. He was frustrated by the British government but proceeded anyway, allowing the Bank of New South Wales (precursor to Westpac) to form as a private bank in 1817, ostensibly with limited liability. By a series of bureaucratic subterfuges he kept the bank in operation until colonial policy changed and this and other banks were re-established on firmer legal ground in the mid-1820s (Holder 1970, p. 70). Other parties issued their own notes for general circulation, took deposits, paid interest, provided trade credit and lent against mortgages – acting as bankers in practice. Sterling was only formally adopted as the sole currency, and the colony formally linked to the gold standard, in 1825. Nevertheless by 1830 there was an effective banking system.

The financing needed to run the colony and subsidise migration came from the sale of land, from various customs duties and by direct transfers from the British Treasury. The balance gradually changed as the private economy developed, and commodity trade expanded, although the subsidy still amounted to 16 per cent of GDP in the 1830s (Butlin 1994, p. 86: including proceeds of Crown land sales). As the productive potential of the land and adjacent seas was realised, private individuals also wished to invest, individually or through companies. Most of the early investment was funded by direct capital inflow, almost exclusively from Britain, although some was funded by bank loans (S. J. Butlin 1953).

The legal framework was slow to adapt. British legislation in 1826 allowed banks to operate effectively as partnerships with unlimited liability, each formed as a joint stock company by a separate Act. High lending rates were made possible by the decision in 1834 that British limits on lending rates did not apply in New South Wales. Operating with unlimited liability, banks were conservative: bank lending was typically very short, heavily secured, and at high rates (10–20 per cent per annum was common), conservative (with liquidity levels above 30 per cent) and extractive (dividends ranged between 15 and 33 per cent per annum).

Domestic and foreign entrepreneurs found the terms attractive, and new banks proliferated. British entrepreneurs founded the 'Anglo banks' – the Bank of Australasia (1835) and the Union Bank (1837), both precursors to ANZ – to facilitate the expanding trade and capital flows. They brought with them important changes, mobilising local capital through deposits, establishing branch banking networks (the Bank of New South Wales operated from a single location until the 1850s) and facilitating capital inflow by selling bills of exchange drawn against their British offices (S. J. Butlin 1961). Despite this, banks struggled and there were lots of false starts.

A sudden stop in capital inflows in the 1840s provoked an extreme shake-up and many banks failed in the resulting recession. S. J. Butlin (1953, p. 320) cites a banker 'who found the causes in the slump in export prices, loss of convict labour, and a "wild spirit of speculation ... which unhappily was fostered and encouraged by the banks and by the government" ... [and] declared that the banks had "participated in the general delusion"'. The banks in that era typically had a form of contingent capital, with shares being only partly paid and subject to call. Many shareholders injected the additional capital necessary to continue operations but owners of deeply troubled banks, facing unlimited calls on their partly paid shares, quickly closed down their banks to realise the assets and repay liabilities. For example, shareholders lost twice their capital investment when the Bank of Australia failed, although some of this was recouped in the final wind-up (Sykes 1988, pp. 38–40). Runs occurred but did not spread (Fitz-Gibbon & Gizycki 2001).

Colonial bank regulations were formularised in 1840 and revised in 1846. The underlying principles had been clarified in debate around the 1844–45 charter for the Bank of Australasia, which imposed various conditions in return: a maximum leverage ratio, public provisions of information, restrictions on related party lending, and a restriction on lending against property and moveable assets (S. J. Butlin 1961, pp. 503–20). Banking quickly adapted to the peculiar local needs in partial violation of the regulations. First, governors and banks conspired to circumvent the restriction on mortgages, and land sales became central to government finances and mortgages to the banking business. This stands in sharp contrast to Canada where the regulations were applied and mortgage lending shifted to the insurance industry (Davis & Gallman 2001, p. 411). And second, banking practices also adapted quickly to the peculiarities of the wool industry, where the opportunity lay both in bridging the time delay between production and sale in its distant market, and in accommodating swings in selling prices. Variable overdrafts and liens on wool (on the sheep's back – i.e. moveable property) served the needs of

squatters but transferred all of the funding risks to the banks. With evolving sophistication the financiers learnt to solve this problem by using fixed rather than variable deposits as their main funding source, by accepting big swings in their seasonal liquidity and by maintaining a pool of funds in London. The banks and specialist pastoral finance houses came to dominate this market. The pastoral finance houses played a key role by providing specialist skills and intermediating between banks and farmers, with banks still providing core financing for wool consignment to London.

Savings banks emerged from the mid-1820s with public support and were designed to husband the savings of the poor. The earliest proposal found it necessary to advise that 'the money of wives or other women will be received from and repaid to them and not to their husbands' (S. J. Butlin 1953, p. 397). The issue of government support for the savings bank was only clarified after a run on the New South Wales savings bank in 1843. Other institutions were minor. From the 1830s insurance companies competed with banks for lending for mortgages, as did solicitors using trust funds. Merchants remained important intermediaries and some mortgage companies appeared. Capital for the banks was raised through private offerings, and in the late 1830s specialist brokers began trading stock, with some published stock lists appearing by the mid-1840s.

The discoveries of copper and then gold added minerals to the export bundle from the 1840s. More wealth accumulated within Australia and was more widely dispersed. Banks adapted their business models rapidly, constructing branch networks to raise local deposits, and the link to the gold standard became more rigid. Bank deposits rose 500 per cent in the four years after gold was discovered, and lending ratios fell as banks searched for outlets for funds (Butlin, Hall & White 1971, p. 112). Interest rates fell sharply. After the initial phase, mining moved underground and justified increasing capital investment, providing a fillip to the nascent stock markets – a natural specialisation, as even today miners depend on stock markets rather than banks to fund much of their investments. As late as 1884, dividends from mining companies provided half the returns on the Melbourne Stock Exchange (Hall 1968, p. 244).

Boom and crash

The period 1860–1900 was dominated by an asset-price bubble that developed in the 1880s and led to the major depression of the 1890s. The crisis was mainly driven by private speculation in property and the excesses of an unregulated financial system after an extended period of strong economic

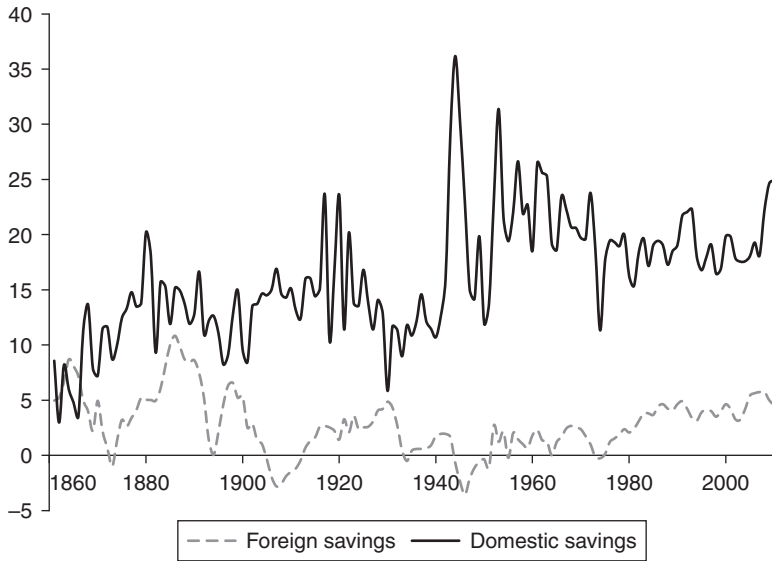


Figure 12.1 Sources of savings scaled by GDP (%), 1861–2010

Notes: The observations are plotted as three-year moving averages. Domestic savings are investment plus (minus) current account inflow. Foreign contributions to savings are measured as the current account deficit.

Sources: Butlin (1962); M. W. Butlin (1977); Mitchell (2003); RBA (2013e).

growth. Governments were not completely innocent – government debt rose from zero in the 1850s to more than 100 per cent of GDP by the end of the century – but no government reneged on or renegotiated its loans during the period. They did, however, raise taxes and cut expenditure sharply after the crash to allow them to service their loans in an austerity drive that deepened the subsequent contraction (Coghlan 1918, ch. VII).

Figure 12.1 sets out the broad availability of finance across Australia's history post-1860. Tracing out the picture chronologically, we can see first that both foreign and domestic annual savings grew strongly as a percentage of GDP during the long 19th-century boom. Both private savers and investors clearly appreciated that the large population increase of the period, the opening up of land for settlement, and the construction of railways and other infrastructure provided potential opportunities for profitable investment. During the long boom both governments and private agents accessed these savings – about 40 per cent governmental and half that devoted to infrastructure (Butlin 1962, p. 16).

Different institutions channelled the savings pool to these distinctive uses. Governments borrowed almost exclusively from London as Australia became deeply enmeshed with the expanding British capital markets, taking advantage of a surge in British offshore lending and cheaper financing. The local bond market was underdeveloped. Referring to the 1860s, Hall (1968, p. 40) says there was little local interest in bonds at 5.5 per cent, when mortgages earned 10 per cent. The London market thus became the natural source of capital for Australian government borrowers. Access to that market was enhanced as the London Stock Exchange refined its rules for colonial offerings and legal changes made it easier for United Kingdom trustees to invest in Australia. After 1890 the process became more formalised: 'Colonial governments had ceased to use Australian banks as their London agents even before the depression, for they could obtain better terms using the Bank of England and the London and Westminster Bank' (Merrett 1997, p. 188). The key investment banker was Nivison & Co., which came to act as agent for all Australian governments, eliminating contention and the need for external underwriting. Its advantage lay in its agents' network in Britain (Davenport-Hines 1988, pp. 193–4). It was a missed opportunity for the Australian banks.

Domestic institutions channelled funds towards private uses: some 40 per cent of private investment went to housing, 40 per cent to rural industries, 15 per cent to industrial and commercial activities and 2 per cent to mining (Butlin 1962, p. 20). In the process and protected by limited liability after the 1860s, banks developed a central role in the domestic financial system, holding about 70 per cent of intermediated system assets by the mid-1880s, with pastoral finance companies the next largest with some 12 per cent. As was the case in other markets, such as Canada, the banking system was concentrated: 'between 1850 and 1914 just four banks accounted for one-half of the total business and eight never controlled less than two-thirds of it' (Pope 1991, p. 18).

While trade was of growing importance, trade finance posed no particular issues. Because the colonies traded principally with and through London, and used the same currency, claims were transferred across businesses as they are within Australia today. All the major banks had operations in London. The main issues had to do with risk and delay, not with financial instruments.

The 1880s featured a classic property bubble, which burst (due to a mixture of local and international factors) and provoked a deep recession. The trigger was probably external, but credit growth had accelerated rapidly after a long period of population increase that created a strong upward trend in both economic activity and the value of real assets. Adding to the potential

for a bubble was the easy access Australia had to British savings, with capital inflow running at more than 6 per cent of GDP per year for most of the decade, much of it channelled through domestic financial institutions (Fisher & Kent 1999, p. 26). Overall lending rose by 20 per cent of GDP in just the last five years of the decade, institutions grew rapidly and lending credit quality criteria weakened. Building societies added to the froth by doubling in size during the late 1880s, outpacing even the strong lending by banks. Some of the price movements were astounding: the net return on land in Melbourne was 35 per cent per year over the period 1880–92 (Silberberg 1975, p. 207).

The shock, when it came, was deep. S. J. Butlin (1961, p. 279) relates that of the 64 deposit-taking institutions in 1891, 54 had closed by 1893, 34 of them permanently. Only nine banks of the 28 banks remained open continuously. Bank credit fell sharply (as is clear from Figure 12.2, below). A lot of debt was written off and shareholders faced additional calls on capital. Despite this, the episode jaundiced public opinion, with the general view being that ‘the banks’ escape by reconstruction was made at the expense of their customers’ (S. J. Butlin 1961, p. 302). By 1900, bank assets were just three-quarters of their level of a decade earlier, building societies had contracted by 80 per cent, shareholders lost capital and deposits were forcibly converted to long-term bonds. Government played virtually no role (Merrett 1997).

There were several unusual features of the banking system that had increased bank risk, and probably contributed to the depth of the crisis. First, banks had over-expanded: by 1880 Victoria had one branch per 2760 colonists; in the United States it was one per 9000. Second, Australian institutions operated a risky business model, borrowing very short (i.e. taking deposits that could be withdrawn at any time) and lending very long (i.e. lending money for longer-term mortgages), contrary to normal British and Canadian practice (Davis & Gallman 2001, p. 550). Third, Australian banks’ funding became riskier: the Union Bank, for example, raised the proportion of offshore deposits from 5 per cent to 22 per cent in the decade to 1887. And fourth, lending criteria weakened (Merrett 1997, p. 186).

Pastoral finance houses that had grown strongly in support of the wool industry shared some of the characteristics of banks, taking deposits and lending long, as well as being narrowly focused. As a result, they too faced significant problems, with a number being reconstructed, especially Goldsborough Mort in 1893. By contrast, insurers suffered little, being protected from runs by the long-term nature of their contracts. As a result, no insurer collapsed, although a number were absorbed by the larger funds (Keneley 2001, p. 154). There was no significant domestic bond market and the stock exchanges

were small, specialising in supporting mining discoveries in Broken Hill and Western Australia.

Macroeconomic shocks

The period 1890 to 1950 was dominated by government borrowing, much of it offshore. Financial institutions were more restrained and the competitive hierarchy changed, with trading banks and pastoral finance houses losing ground to savings banks and insurance companies. The Great Depression experience of the 1930s played a formative role, not because of the collapse of financial institutions, but because governments formed a view that they needed stronger tools (over money supply and the exchange rate) to manage the economy more effectively. They then took these functions from the private banks, and by 1950 ensconced central banking in Australia.

The 1890s depression was deep and protracted. Many investors had suffered losses and foreign investors drained their savings from Australia. As the economy recovered from about 1905, national savings rose even while access to foreign savings was limited (Figure 12.1). It is not completely clear why this happened, although Canada saw a similar rise and the levels achieved, about 15 per cent of GDP, seem moderate given subsequent Australian experience. Foreign capital inflow increased so that by the later 1920s it was adding another 5 per cent to the funds available for domestic use.

The government share of total investment rose after the 1890s depression to more than 50 per cent of the total (Butlin, Barnard & Pincus 1982, p. 23). Much was still directed towards infrastructure – principally on roads, rail and communications, water and sewerage. To help finance this, governments continued to borrow heavily through the traditional London channels, although they also accessed domestic savings through government-owned savings banks.

The private sector played a more subdued role and the balance changed somewhat. While mortgage finance continued to absorb 40 per cent of the available funds, rural lending halved to 20 per cent, with industrial and commercial borrowing absorbing most of the rest (Butlin 1962, pp. 16–19).

The role of the trading banks was much reduced. As a result of consolidation following the 1890s depression, the number of trading banks fell to 11 by 1930 and their share of financial system assets fell from around 70 per cent to about 40 per cent as deposits flowed to safer savings banks and insurers. Managements were also much more cautious as they (1) cut advances relative to GDP (as is clear from Figure 12.2 bank loans relative to GDP fell sharply), (2)

reduced funding risks by cutting liabilities to British residents from 45 per cent of liabilities to 15 per cent and (3) diluted concentration risk by spreading lending geographically within Australia (Butlin, Hall & White 1971).

As with the savings banks, insurance companies grew strongly and by 1930 comprised some 20 per cent of system assets. AMP, founded in 1849, had become the dominant insurer by 1880 but lost share to other mutuals by 1930. Even in the absence of regulation, the insurers became more conservative, increasing government and semi-government securities holdings from 3 to 50 per cent of their assets by the mid-1920s, and halving the proportion of mortgages – they held virtually no equities (Keneley 2006, p. 160).

While retained earnings continued to be important, the state stock markets strengthened by providing greater national consistency. One indicator cited in Were (1954, p. 246) lists £11 million raised in 1927, a year in which bank advances were flat (Butlin, Hall & White 1971, p. 155); another is Forster's 1964 calculation that 60 per cent of manufacturing investment in the 1920s was funded by equity. There were still weaknesses, however, in funding major investments. Forster finds that direct foreign investment constituted a quarter of total manufacturing investment in the 1920s. A second example is the Collins House group, which became prominent through a funding model that used the dividend stream from mining-production companies to finance the development stage of other operations. The model gave rise to a number of successful Australian corporations (Richardson 1988).

The bond market had received a fillip from the effective closure of the London market to many Australian issuers after 1890, with government bonds on-issue growing from 6 to 14 per cent of GDP between 1899 and 1913 (Merrett 1997, p. 189). With markets again closed for periods around World War I, the government raised substantial loans locally, mainly through direct appeals rather than on-market. By the mid-1920s, however, government borrowing reverted predominantly to foreign markets.

Unfortunately, the 1930s revealed a structural weakness in the financial system. While the 1890s depression reduced private-sector gearing, Australian governments had continued to borrow heavily, for relatively short terms and in a foreign currency (gold). By 1929 gross foreign debt was close to 100 per cent of GDP, and one-quarter of export income was being used to service offshore public debt. Total public debt rose to more than twice GDP during the crisis. The problems had been exacerbated by World War I when federal government debt rose from 2 per cent of GDP to more than 50 per cent, but the fundamental issue was that there had been no real attempt in the postwar period to reduce debt-servicing costs. When export revenues fell at

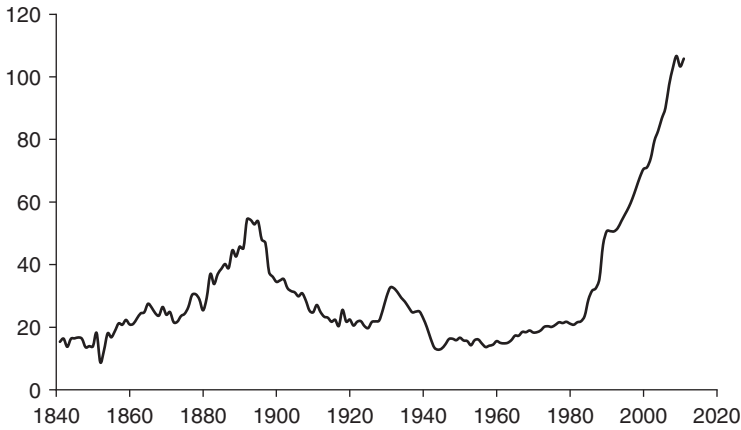


Figure 12.2 Bank intermediated credit relative to GDP (%), 1840–2013

Sources: Butlin, Hall & White (1971); RBA (2013e)

the end of the 1920s, governments could not pay their debts. A public-sector funding crisis, and broader economic crisis, ensued (Schedvin 1970, Chapter IX; Valentine 1987b).

Bank credit during the interwar years was very restrained compared to the 1880s experience (Figure 12.2), and the banking system emerged from the Great Depression virtually intact, in sharp contrast with the earlier period. It is instructive that the banking system survived a major global financial crisis unscathed, even in the absence of a central bank or any prudential regulation. It is also notable that Canada's experience was very similar to Australia's and in sharp contrast to the United States (where unit banking was the norm). There was only one significant Australian bank failure of the 1930s, at the Government Savings Bank of New South Wales, and then largely because of political uncertainty (Fisher & Kent 1999, p. 16). That bank was merged with the Commonwealth Bank, which had been founded by the federal government in 1911 but operated as a commercial bank, with no substantial regulatory responsibilities.

There were, however, political consequences. Under the gold standard the trading banks (including the government-owned Commonwealth) had traditionally operated Australia's fixed exchange rate regime by maintaining foreign reserves in London and expanding and contracting domestic credit in order to preserve parity with sterling. This structure (which Australia had accepted anew in the mid-1920s after going off gold during the war) put government in a weak position to implement its preferred macroeconomic

policies during the Great Depression – notably, the devaluation of the Australian pound in 1930 was actually undertaken by the private Bank of New South Wales. Government resented having to negotiate with the banks in a time of significant crisis. The upshot of these tensions was the establishment in 1936 of a Royal Commission into banking, whose purpose was ‘To inquire into the monetary and banking system at present in operation in Australia, and to report whether any, and if so what, alterations are desirable in the interests of the people of Australia [as] a whole, and the manner in which such alterations might be effected’. While the recommendations had little immediate effect, they inspired much of the coming wartime and postwar legislation. Schedvin (1992) describes the evolving legislative arrangements.

By the opening of World War 2, government policymakers had a stronger set of tools. They took control of foreign reserves from the banks; imposed direct controls on the level of private borrowing, and the level and direction of lending; forced the banks to hold funds in special accounts; forced reductions in branch numbers; and imposed tight limits on price, on profits and on dividends. The banking system was transformed during the war years: ‘In banking reform at least, the sword was mightier than the pen’ (Giblin 1951, p. 275). Economic expansion bypassed the credit system, and bank advances fell. Government securities replaced loans among bank assets, some as part of prudential requirements and some as part of profit control. The forced lowering of interest rates reduced funding costs but in the process shifted bank liabilities from fixed to more variable deposits as a source of funding. Butlin and Schedvin (1977) survey the war economy.

Financial repression

From a financial point of view, the period after 1950 was dominated by major macroeconomic experiments. Some of these were driven globally under the Bretton-Woods arrangements, such as fixing the exchange rate and curtailing financial flows. Some were domestic, such as forcing financial institutions to hold government bonds paying a negative real rate of interest to help reduce government debt; setting many borrowing and lending rates; and directing investment. One motivation was to prevent a recurrence of recession, to help maintain full employment and to lessen government budgetary pressures (Schedvin 1992, pp. 130–9). The grand experiment worked for a period, but broke down in the chaotic decade of the 1970s and needed to be completely redesigned. If the attempt by the Chifley Labor government to nationalise

the banks in 1947 had not been struck down as unconstitutional, the redesign in the 1980s would have been more complicated.

The level of domestic savings rose sharply in the postwar period, well above prewar levels (Figure 12.1). It is not clear why this happened (Maddison 1992; McLean 1994). The rise compensated for the decline in capital inflow that had resulted from the tight controls. The nature of the inflow also changed, with private equity replacing public debt, equity that flowed particularly into the relatively protected manufacturing sector. There has been little analysis of the cost of foreign investment foregone during this period (Lowe 1992; Makin 2006).

The pattern of spending also changed abruptly, with private-sector investment absorbing most of the increase in savings. Just under half of private investment went into dwellings, accommodating the rapid postwar population increase and supported by the public war service homes scheme. During the 1950s manufacturing, commerce and farming equipment absorbed most of the other investment, but by the 1960s mining and finance played a larger role. While domestic actors were able to increase spending through retained earnings and equity injections, they also increased their borrowings. Corporate debt-to-equity ratios rose progressively, from around 0.28 in the 1950s to 0.45 in the 1970s, and household liabilities also increased as a proportion of GDP – from around 0.10 in the 1950s to 0.30 in 1980. Much of this latter borrowing was to invest in housing and durable goods (S. J. Butlin 1987; Van der Eng 2008).

A significant portion of the additional wealth of the period was siphoned off by the government by forcing a large part of private savings into government paper and paying a negative real rate of return on it. The structure was severe: through the 1950s about half of bank assets were required to be held in liquid government securities or special reserve accounts with the central bank. The effect on public debt of having captive borrowers, but paying them below-market returns, is very substantial. The contractual real interest rate on government debt averaged -1.7 per cent per year over the period – a hidden tax on savings equivalent over the whole sample of 3.3 per cent of GDP per year (effectively adding 12.9 per cent per year to tax revenues). Reinhart and Belen Sbrancia (2011) find that Australia's ratio of public debt to GDP fell from 144 to 19 per cent over the period 1945–1980, but that if inflation had been 2 per cent per year, it would only have fallen to 99 per cent.

As a result of this structure, finance increasingly bypassed the heavily regulated trading banks. Lewis and Wallace (1985, p. 2) calculate that the trading banks' share of the total financial system assets fell from two-thirds in 1929 to

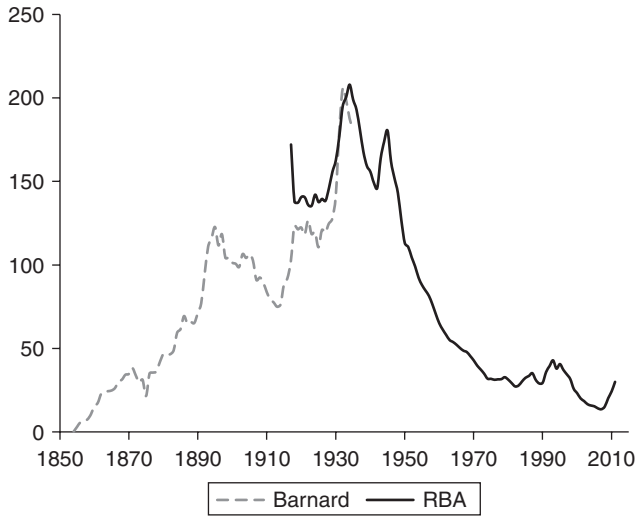


Figure 12.3 Public debt share of GDP (%), 1854–2011

Sources: Vamplew (1987, p. 256) (Barnard debt series); Black et al. (2012, p. 8)

just 42 per cent by 1970 (the impact is clear in Figure 12.3). The private banks responded to regulation in three ways: (1) by establishing unregulated arms to compete more freely; (2) by forming savings banks to compete more effectively with the government-owned Commonwealth Bank; and (3) by forcing the separation of the central banking function of the Commonwealth Bank from its commercial arm. The success of their savings bank strategy meant that by 1970 they had a 35 per cent share of the savings bank market, from a zero base in 1955. The political strategy to divide the Commonwealth Bank succeeded and was implemented in 1959 legislation. The Governor of the Bank, Nugget Coombs, had been successful in building some confidence in banking regulation but was not able to prevent the splitting of his institution (Schedvin 1992, ch. 9). The new central bank, the Reserve Bank of Australia, became manager of monetary policy and regulatory supervisor.

Consolidation also continued and by 1970 there were just seven substantial banking groups, with the top four controlling some 75 per cent of system assets (on a consolidated basis). The Reserve Bank was sanguine: ‘The Bank’s assessment of the [merger] proposals ... was that the sharp increases in concentration conferred benefits on the system and in other respects was largely benign’ (Schedvin 1992, p. 398). On the other hand, it frequently rejected entry by foreign banks.

The banks also changed their business models. With limited exchange risk and large holdings of government securities, they reduced their capital ratios (shareholders' equity as a percentage of total assets) from above 15 per cent to about 5 per cent. They also took additional liability risk, letting fixed deposits fall from some two-thirds of liabilities to one-third by the mid-1960s, and more business model risk through involvement in the finance company sector, particularly after regulations on capital raising were relaxed in 1953 and while restrictions on personal loans by banks remained in place (until 1963).

Given the rise in savings, and with banks tightly controlled, other less-regulated intermediaries surged. Building societies, for example, had advantages in lax state-based regulation. With few liquidity standards, minimal reserves, and (effectively) call deposits, they grew from under 2 per cent of system assets in 1945 to 8 per cent at the end of the 1970s but faded after financial liberalisation (Thompson & Abbott 2010). While regulation hindered trading banks' operations in wholesale markets, investment banks (called merchant banks) thrived. Their share of financial assets grew from effectively none in the mid-1950s to nearly 4 per cent by 1975. Unable to get banking licences, foreign banks entered by this route.

Stock markets similarly flourished. Given the poor returns on government bonds, and the absence of capital gains taxation until 1985, stock markets became a key source of funds for business (Fleming, Merrett & Ville 2004, p. 141). Arndt and Harris (1965, p. 82) suggest that the markets' share of total financing through new raisings rose from 18 per cent in the mid-1930s to 56 per cent by the 1960s, while the banking sector contribution fell from 59 to 24 per cent. Insurers also switched their portfolios heavily into equities. Their holding of government securities fell from 71 per cent in 1945 to 36 per cent in 1960, before regulations were introduced that required them to hold 30 per cent of their assets in government paper (Keneley 2001, pp. 159–60).

The bond market was dominated by government and semi-government issuers until the early 1990s. Unlike the United States and Britain, Australian trading banks held few government bonds until the 1930s, relying on fixed deposits to protect themselves from runs – government paper was some 10 per cent of assets on average between 1900 and 1930 (Butlin 1997). Some advances were made with an official short-term money market formed in 1959 that rendered bonds closer substitutes for cash (Schedvin 1992, pp. 254–61). From the mid-1980s the market grew rapidly, with issuance rising from about 10 per cent of GDP to more than 60 per cent, with three-quarters of the bonds issued by banks. While after the war Australian households held

about half the bonds on issue, they now hold few – offshore institutions hold two-thirds (Black et al. 2012, p. 24).

The 1970s challenged domestic policymakers. They got exchange rate movements wrong, and they got domestic policy wrong (Pagan 1987). The upshot was that, by the 1980s, policymakers limited their ambitions, focusing policy on internal balance and forcing domestic actors to adapt to exchange rate and capital account volatility. The major success of the post-war era lay in solving the historic public debt problems by coordinating the accumulation of public debt (through Loan Council from the 1930s), by reducing public debt through inflation and by eliminating the governments' offshore borrowing exposures. The banking system was heavily repressed, but new institutions eluded the regulations.

Liberalisation with regulation

The breakdown of Bretton-Woods made change inevitable in Australia and many other countries; as a former governor of the Reserve Bank put it: 'I think politicians and key economic bureaucrats came to realize that the process of setting key financial prices ... was not working. It was just too difficult to do it properly' (Macfarlane 2006, p. 45). Over the course of a decade, and sanctioned by two government inquiries, most restrictions were lifted, the currency was floated and free capital flows were allowed (Harper 1986). Financial sector value added has doubled since then, and now constitutes more than 8 per cent of total Australian GDP.

The overall savings rate fell after liberalisation and then recovered. Households have mainly driven this trend, with savings falling by 10 percentage points of GDP, bottoming around 2002 and then rising by 5 percentage points over the subsequent decade (Bishop & Cassidy 2012, p. 9). Interestingly, and different from many other countries, the trend decline reversed well before the global financial crisis of 2007–08. Corporate savings have trended up slightly. Government has been more cautious about borrowing than it was in the century from 1850 so there has been no real trend in government savings or dissaving.

Households have borrowed heavily while their savings fell, so their debt rose from about 50 per cent of their income in the early 1980s to more than 150 per cent by 2007. Many countries saw similar increases, reflecting the rebound from financial repression, increased credit availability and the boost to demand as low inflation made debt more serviceable. Australian corporate borrowing surged after liberalisation but has subsequently stabilised,

with the gearing ratio of debt to equity rising from about 0.45 to more than 1 in the 1980s before falling sharply and stabilising at about 0.5 (RBA 2013d, pp. 42–6). Government has borrowed heavily during recessions, and run surpluses at other times, but is now less important a borrower than it was historically.

The restructuring of household balance sheets and the re-emergence of large capital inflows have provided opportunities for the banks. They reintegrated their finance company arms and their savings banks, and most acquired wealth management (superannuation) businesses, emerging as financial conglomerates borrowing offshore to fund part of their growth. There were important scares: in 1992 Westpac's problem loans exceeded shareholders' funds as low-quality corporate lending had surged and deep governance problems emerged (Carew 1997). ANZ had similar problems, and two state-owned banks collapsed. The Commonwealth Bank took over the Victorian bank as part of a deal with the government that allowed it to be privatised. This effectively ended government ownership of banks in Australia.

The structure of the Australian capital markets is now similar to that of OECD countries. The ratio of bank lending to GDP is about average. The domestic bond market is also about average size – although banks are a larger proportion of issuers and offshore investors hold a higher proportion of domestic bonds than is usual. The equity markets are large: capitalisation of the local stock market ranks ninth of the 34 OECD members when measured as a share of GDP (Davis 2011, p. 306).

The 2007–08 financial crisis revealed how dependent the banks were on foreign funding sources. Faced with the risk of global wholesale markets closing, and foreign governments guaranteeing borrowings by their banks, the Australian government followed suit. Government also guaranteed deposits for a period and subsequently rethought the issue of deposit insurance (Brown & Davis 2010). The resilience of the majors was a result of their underexposure to investment banking, their conservative lending practices, the absence of off-balance-sheet vehicles, and tight supervision (Davis 2011). They absorbed two second-tier banks during this period. The context was important: the economy was robust, the exchange rate flexible, and fiscal, monetary and regulatory responses by the authorities were rapid and effective (IMF 2010, pp. 3–7). The long drive to reduce government debt provided space for fiscal expansion during the crisis.

The growth in equities has been substantial, both direct and intermediated by superannuation funds. Stock exchanges were gradually transformed. They moved from partnerships to corporate form in the 1970s,

and accepted companies as members in the 1980s but lost the right to fix prices in the mid-1980s (under regulatory pressure). In 1987 they united to form a national exchange, and the entity demutualised and listed on its own exchange in 1998. A series of other policy changes encouraged private shareholding: the privatisation of a number of major government businesses and major de-mutualisations, the improved tax treatment of dividends, the entrenchment of negative gearing for housing and the elimination of stock market transaction taxes. On-market capital raisings now provide about half of business external funding, mainly as equity, while banks provide the residual. Currently, some 35 per cent of the population owns shares directly, which is comparable with the United States and Canada, and roughly double European levels. Technological change has been important, with electronic transfers and market liberalisation combining to reduce retail trading costs from 2.5 per cent in 1983 to 0.2 per cent on an average trade today (author's calculation). The physical trading floor was closed in 1990, and full automation achieved in 1996.

Policy that encouraged transferable, individual retirement accounts has strengthened savings, increased financial understanding and deepened the wealth management industry (Connolly 2007, pp. 15–18). One effect has been to channel household savings away from bank deposits and through the wholesale market, reducing the deposit base of banks, which in turn has forced them to raise more funds in wholesale markets. A second effect is to move more savings into equities (the century-long equity risk premium is more than 6 per cent: Brailsford, Handley & Maheswaran 2012) and to invest more of it offshore. The net effect of superannuation and regulation is thus to raise returns to savings while making debt capital more expensive and equity capital less expensive. Wholesale managers were quick to respond to corporate requests for equity injections during the global financial crisis, which added to system resilience (Australian Stock Exchange 2010). Overall, the rise of superannuation and emerging international regulatory rules are changing the flow of funds within the economy and altering how Australia's capital markets operate.

Foreign entrants are important only in investment banking, broking and payments. It is not clear why, unlike say Canada, domestic banks have ceded share to foreign investment banks. We see something similar in broking, with only two local institutions in the list of top 10 brokers. Payments is the other area of significant foreign entry. The foreign card companies Visa and MasterCard have captured much of the payments' pool as cheques have been replaced by cards and electronic instruments. Australian banks have

had little success offshore other than in New Zealand (Merrett 2002d, p. 385). Macquarie Bank, which commenced operation as a subsidiary of Hill Samuel & Co., of London in 1970, is the exception. It has succeeded both in investment banking and in internationalising. Some 60 per cent of its profits come from offshore and half of its staff works outside Australia. Local players have had greater success against the domestic banks. Mortgage brokers such as Aussie Home Loans (founded 1992) used relatively cheap, wholesale funding to attack bank margins in origination, and spurred the development of securitisation. While the major banks currently manufacture about 90 per cent of mortgages, brokers distribute about 40 per cent.

Australian governments have little debt so the supply of government paper is both quite limited and heavily bid. The non-government market is almost four times as large. Banks dominate issuance since it has generally been cheaper for them to borrow, in Australia or offshore, and then on-lend to domestic corporates. As banks face higher regulatory hurdles, more corporates are likely to go directly to market for funds. Black et al. (2012, p. 23) also note the rise in foreign entities issuing Australian dollar bonds locally.

Financial markets are growing rapidly. The demand for derivatives, futures and options over currencies, equities and debt contracts, for example, has trebled in the last decade. Much of the growth is driven by the need to manage risk, notably currency risk, since the float of the Australian dollar. Trading in debt and currencies dwarfs equity trades, and derivatives rather than physicals predominate (Davis 2011, Table 3). The Australian dollar is heavily traded globally.

Regulation evolves. The Reserve Bank instituted minimum capital standards for banks from 1981 and strengthened them in accordance with international standards within a decade. In response to the problems in corporate lending after liberalisation, the Bank also introduced concentration limits on lending (Cornish 2010). There was a major shift after the 1997 Wallis Inquiry with the establishment of a separate prudential regulator, and a separate securities regulator, leaving macroeconomic stability issues with the Reserve Bank, all coordinated through a council. The review also switched the focus of regulation from institutions and towards functions, and thereby justified bringing all institutions within scope of a single prudential regulator. Stock market regulation has also been progressively moved from the markets themselves and towards the securities regulator. Nevertheless, each domestic or offshore problem that emerges is met with more regulation – markets have been liberalised, not deregulated.

Conclusion

As the economy has evolved, and the regulatory settings changed, the financial system has continued to adapt. And it has generally adapted quickly and effectively. Changes in the structure of the real economy – caused, for example, by the gold rushes, the rise of pastoralism, and demographic shocks – have seen banks alter their business models. The changes have also required specialist financial entities, such as the pastoral finance companies, merchant banks, building societies or securitisers, to evolve to fill niches. Where some institutions have been slow to react, others have exploited the opportunities. Examples include the stock markets emerging to fund mining from the 1850s, mortgage specialists emerging in the 1880s and 1990s, and the insurers and the savings banks in the first half of the 20th century taking ground from the trading banks.

However, some processes have played out slowly. It took a decade for the excesses of private speculation in the 1880s to become apparent, and the resolution then devastated the economy for a decade. This is precisely the period McLean identifies as the only time when the Australian economy has not shared a major global economic expansion (McLean 2013). Government then proceeded to increase risk over the subsequent 40 years, borrowing off-shore, in a foreign currency, with a need for more frequent refinancing. These measures gave rise to the financing problems of the 1930s and were called to account in the interwar Great Depression. Determined not to repeat the problems of the past, government then squashed the capital markets, private institutions and the wealth of savers, in an experiment that ran through until the 1980s. The policy eliminated the problems of financing the public debt, by eliminating the debt, but ultimately failed, ending with high inflation, high unemployment, rapid exchange rate realignments, and severe economic disjunction, in the 1970s.

A new regime has been in place since the early 1980s. Capital markets have expanded rapidly, mainly driven by a major run-up in household debt and increases in the volumes of financial assets traded. The experiment is still running but has survived a major global financial crisis, so it is possible that private actors now have the capacity to manage the wide range of shocks to which they are exposed. While sudden stops to capital inflow were central to the 1840, 1890 and 1930 depressions, flows are now smaller relative to GDP, which in itself adds to systemic resilience.

Manufacturing

DIANE HUTCHINSON

Introduction

Australia's geographic isolation meant that the first convict settlers almost immediately had to produce simple consumer goods. The range and volume of local manufactures increased over time, but, in the 19th century, the natural resource sectors were the prime drivers of Australia's economic performance (Greasley, this volume). In the 20th century, as the natural resource sectors' contribution waned, manufacturing's role became more central, but industrialisation was neither a quick nor simple process. Federation provided the institutional setting for industrialisation but initial progress was more qualitative than quantitative. Manufacturing's share of GDP and employment grew slowly. Labour productivity increased but it was still only about half the economy-wide average until in the 1930s. Thereafter, the pace of industrialisation accelerated. By the 1960s the manufacturing sector produced a wide range of products, including complex producer goods and materials. It contributed around 28 per cent of GDP and employment, with productivity levels approximately equal to the national average. Australia had become a modern industrial economy, but almost immediately it began to deindustrialise. By 2010–11 manufacturing's share of GDP had fallen to just over 8 per cent.

Industrialisation context

Australia's industrialisation shared many characteristics with other economies but there were also distinctive elements, with its resource-led 19th-century development impacting on both the role of industrialisation and the scope for it. In most developed western countries, industrialisation was a key turning point because it initiated substantive and sustained growth in GDP per capita and living standards. This occurred through two conceptually

different mechanisms. The first, often called dynamic growth or growth in labour productivity, occurred through the use of more capital or better production methods – better technology. Manufacturing had offered more scope than other sectors in these developed western economies for improving labour productivity through the application of capital equipment and the development of new technologies. The second mechanism was the static effect that occurred when manufacturing's share of GDP increased, simply because a larger share of the economy's resources was allocated to the high-productivity sector, with a smaller share in the low-productivity sector it displaced. However, as both Schedvin (1987b) and McLean (2013) have emphasised, industrialisation could not play this same role of initiating growth in GDP per capita in Australia, because high productivity had already been achieved in the natural resource sector before industrialisation. Manufacturing was the low-productivity sector. This was a characteristic Australia shared with the other so-called European settler economies such as Canada that experienced strong growth based on a natural resource export sector in the 19th century. But distinctive features of Australia's resource-led growth limited the scope for its manufacturing sector to develop to the stage where it could become a high-productivity sector.

Most attention has focused on the negative impacts of Australia's specialisation in wool. Specifically, wool provided little direct stimulus to manufacturing through its input requirements or value adding of output – this was in contrast to the impact of the production of commodities such as wheat in which other settler economies specialised. In addition, Australian wool production required relatively little labour, and so provided a weaker stimulus to immigration and a smaller domestic market for manufacturing than in other settler economies. The fruits of Australia's 19th-century development were also reasonably widely distributed and, as the economy recovered from the 1890s depression, there was broad-based support for restoring and then maintaining pre-1890 wages and living standards (Hatton and Withers, this volume). While the small market meant Australian manufacturing would be uncompetitive in those manufacturing industries with more capital-intensive production methods, relatively high wages impacted on competitiveness in labour-intensive industries. Industrialisation, then, was necessarily dependent on the domestic market, but even that was conditional on protection from import competition. Some industries benefited from the natural protection afforded by transport costs and Australia's distance from major exporters; but for others government policy was critical.

Industry protection

Federation established the political institutions that facilitated industrialisation. It abolished internal trade restrictions, providing manufacturers with tariff-free access to a national market. It also provided the institutional setting for a supportive, national tariff on imports and a national development strategy. The emerging consensus on national industry protection after Federation and subsequent tariff policy are discussed in other chapters of this volume (Wilson, Borland, this volume), as is the relative nominal rate of assistance to manufacturing and agriculture (Butlin, Dixon and Lloyd this volume), but the broad policy outcomes are worth outlining here. The most recent estimate of average nominal duty on manufactured imports (Lloyd 2008) shows that Federation had little immediate impact on protection. The average tariff level only began to climb consistently in the 1920s. This increase was dwarfed by the massive tariff hikes in 1930–31 that, along with devaluation, were designed to address Australia's balance-of-payments problems (Schedvin 1970). These 'emergency' tariffs were only slowly wound back – a process that was far from complete by World War 2. Average duty rates declined after the war, interrupted only by the impact of the Korean War boom, to the point where by the 1960s average nominal import duties were around the same level as in the mid-1920s. What mattered for each traded goods industry, though, was the protection afforded its products, and this varied widely. Reliance on tariffs to deliver this protection also changed over time. During 1915–18 and 1940–48, war and postwar disruption to trade due to shipping shortages was more important in insulating local industry (Forster 1953; Butlin & Schedvin 1977). In the 1950s, import licensing imposed in the face of further balance-of-payments problems, and the discriminatory way in which licences were issued, was more important in protecting most manufacturers from import competition (Moffatt 1970).

Industrialisation interpretations

Interpretations of Australia's inward-looking industrialisation have depended heavily on timing and the perspective this has afforded. Until at least the mid-1980s, the resource sector was highly volatile. It was not clear that Australia was experiencing a long-term reversal in its terms of trade, nor that resources could provide more than an intermittent stimulus. As a result, most economic historians saw industrialisation as necessary to growth in living standards. Their research focused on understanding the industrialisation

process and on explaining why it took so long. Forster (1970) emphasised the inability of firms to gain economies of scale because of the small, fragmented domestic market, compounded by its distance from other large markets, which he argued explained why small European economies were not an appropriate yardstick. Schedvin (1987b) made a similar point in respect of using another settler economy, Canada, as the yardstick. These economic historians understood the complementarity between industrial development and population growth. However, technological change was increasing the optimal scale for many industries up until the 1970s and Boehm (1993) depicted Australian industrialisation as a race between growth in market size and growth in optimal scale. While these economic historians acknowledged imperfections in the implementation of protection policy, especially in the 1960s, industrialisation was normally seen, at least implicitly, as a necessary objective. In the 1980s, though, analysis of economic 'league tables' came into vogue. These revealed that Australia appeared to have slipped down the league since the 1890s. Protection-dependent industrialisation was identified as a strategy that had depressed economic growth by directing resources to a low-productivity sector, and encouraged rent-seeking behaviour at the expense of entrepreneurship that would maximise productivity growth. The wheel has turned again, though, with recent Australian research providing more positive interpretations. Merrett and Ville (2011), for instance, found evidence of manufacturers responding to growth opportunities rather than rent seeking in the period to 1939. McLean's (2004, 2013) recent long-run research is particularly important. He debunks the view that Australia's aggregate performance until the 1970s was problematic. He does acknowledge that industrialisation had an unquantified but negative effect on GDP per capita through the expansion of a low-productivity sector, but, harking back to the approach of earlier economic historians, he also emphasises the strong employment creation benefits of industrialisation, as well as balance-of-payments and strategic benefits. More generally, he argues that critiques of Australia's inward-oriented industrialisation are a 'somewhat ahistorical interpretation of the feasible growth strategies available to Australia' until the 1960s, especially in view of the dominant contemporary objective held until the 1960s of expanding the population without depressing living standards (McLean 2013).

For contemporaries in the early 20th century, industrialisation also had great symbolic value. For the new nation, evidence of industrial development was a source of pride, indicative of Australia's transformation into a modern nation with appropriate institutions, industries and capabilities, in

much the same way that rates of computer and internet usage are used as an indicator of modern capabilities in developing countries today. For our purposes, this had a lasting benefit in the form of a rich data resource – a relatively consistent census of all factories carried out every year from 1903 to 1967–68.¹ This data was summarised in annual yearbooks with a level of detail accorded no other sector and was accompanied by commentaries and supplementary data. The Commonwealth Statistician saw this data as providing the basis for a ‘proper comparative study of the development and progress of various manufacturing industries’ (CBCS 1912, p. 537). Since this is the purpose of this chapter, we make extensive use of this data to explore the growth in employment, value of production and labour productivity of different industries.

Industrialisation: ‘development and progress’

Nineteenth-century development laid a substantial foundation for industrialisation – manufacturing’s share of GDP stood at around 12 per cent in 1901 (Butlin, Dixon and Lloyd, this volume). However, the sector remained very narrow, producing mainly consumer goods – food, drink, footwear and clothing, and newspapers – and simple building materials, forgings and castings, with some engineering and metal fabrication, but little machinery and almost none of the intermediate materials needed to manufacture and market these products. The average size of factories was small; some industries added little value to their inputs; and most used simple technology and little capital equipment, resulting in low labour productivity, with some notable exceptions. Industrialisation gradually changed this, with a broadening and deepening of the industrial structure and increases in labour productivity.

Table 13.1 shows three snapshots of the structure of the manufacturing sector, with the relative size of each industry group represented by its share of sector employment and its share of sector output, defined as (net) value of production, a concept akin to value added. Besides showing the relative size of each industry, comparisons between these two measures provide a broad indicator of relative labour productivity – industry groups whose

¹ The definition of a factory included all establishments that used power or employed four or more persons. The classification system was changed substantially in 1930, when 19 industry classes were collapsed into 13. Other limitations are the incomplete nature of the early data, and the size and disparate nature of some industry classes, especially the important ‘industrial metals and machines’ class.

Table 13.1 Industry groups, share of manufacturing employment and output (%), 1910 to 1967–68

	1910		1939–40		1967–68	
	Employment	Output	Employment	Output	Employment	Output
Food and Drink	15	24	15	22	11	13
Textiles and Clothing ^a	28	15	24	15	14	9
Wood and Furniture ^b	12	11	8	7	7	5
Paper	8	9	7	7	7	8
Building Materials ^a	4	4	4	5	4	5
Metals and Machines ^c	20	24	32	32	48	44
Chemicals ^d	2	3	4	7	4	10
Skins and Leather ^b	4	4	2	2	1	1
NEC ^b	7	5	4	3	5	5

Notes:

a. Initial official industry class retained for 1939–40 and 1967–68 after it was separated into two classes.

b. Smaller industry classes grouped together.

c. Shipbuilding, an industry folded into this class in 1930, was added to create the group for 1910. The reclassification in 1930 also added motor vehicles, which was a tiny part of an industry included in NEC for 1910.

d. Treating oils and fats (mainly soap and candles), an industry folded into chemicals in 1930, was added to create the group for 1910.

Sources: CBCS (1912, 1941, 1969).

share of employment is larger than their share of value of production exhibit below-average labour productivity in manufacturing. The nine industry groups are an aggregation of classes in the official industry classification. The three snapshot dates are 1910 – the first date for which a full set of reliable data is available; 1939–40, which was an important turning point; and 1967–68, which approximates the high point of industrial development (Boehm 1993). As is so often the case with aggregated data, the devil is in the detail – what happened at the level of narrow industries servicing specific product markets? In some cases more disaggregated data were also published, and Table 13.2 provides some examples of these.

Natural resource sector linkages and producer goods

The weak stimulus from natural resource export industries is evident from the absence in Table 13.1 of a large industry value-adding to exports. Wool was used by an infant woollen textile industry but this was to supply the local market. The Skins and Leather group was small. The tanning, fellmongering and wool-scouring industries together employed around 5000 people in 1910 (CBCS 1910a) but mostly served the local market. Meat chilling, part of the Food and Drink group, was more oriented to exports but it also employed only 5000 people and added very little value. Similarly, local manufacturers provided few inputs for the pastoral industry until the expansion of wire-netting production from 1911 onwards. Mining had potentially stronger linkages but inputs such as explosives were still imported in 1910. In base metals and copper, local smelting of concentrates began in the late 1890s and, while only a small proportion of ore was processed prior to export in the Federation decade, this was nevertheless a substantial new industry. It employed almost 9000 people in 1906, making it one of the three largest employers in the Metals and Machines group, but, perhaps due to definitional changes, employment was less than 7000 people in 1910 (CBCS 1908, 1912). Expansion of base-metal processing by the Collins House Group from 1915 onwards, in response to wartime disruption to its export markets, and its subsequent forward integration into base metal-using industries in the 1920s and 1930s to serve the domestic market, were more important (Richardson 1987).

Although the wheat industry still relied more on the domestic market than on exports in the Federation decade, the industry's potentially stronger stimulus to manufacturing was already evident. It provided the primary market for new industries such as fertilisers – the first chemical product to be manufactured locally on a large scale, and the only major producer material in the Chemicals group. Wheat growers were also the primary market for agricultural machinery, part of the large Metals and Machines group. The Commonwealth Statistician described agricultural machinery in 1906 as one of Australia's few specialised metal-fabricating and machine industries; he also praised its innovation and export performance (CBSC 1908). But as Table 13.2 shows, the industry's labour productivity – value of production per worker – was not distinctive, being the same as manufacturing as a whole and below the level of Metals and Machines in 1910. In part this was because drought and erratic wheat yields impacted on the rate of mechanisation in the early 20th century. The fertiliser

Table 13.2 Productivity in selected industries and industry classes, 1910 to 1959–60

	Production per employee (current £ per annum)		
	1910	1929–30	1959–60
Industries			
Woollen mills	114.2	245.5	1299
Boots	101.0	248.8	
Clothing		203.6	1060
Cotton spin and weaving			1659
Confectionery	146.7	392.6	1647
Soap and candles	299.8	588.4	
Agricultural implements	168.0	315.8	1483
Wireless and amps			1549
Motor vehicles		314.8	1516
Industry classes			
Textiles and Clothing	83	224	
Food and Drink	254	527	2060
Treating Oils and Fat	301	603	
Metals and Machines	196	356	1700
Manufacturing sector average	161	356	1790

Sources: CBCS (1912, 1931, 1962).

industry also struggled initially to build a market among grain growers, despite the demonstrated impact of adding fertiliser to Australia's nutrient poor soils. However, even with a larger market for agricultural machinery in 1929–30 and 1959–60, labour productivity remained relatively low. While there may have been idiosyncratic factors at work, this industry's performance is symptomatic of much of the Metals and Machines group.

Metals and Machines was one of the largest industry groups in 1910, but its size belies its sophistication. Although it manufactured some simple consumer durables – cookware, iron beds and the like – most of its products were producer goods and materials. They included metal castings and forgings and other engineered products where jobbing or customised production was common, along with equipment such as pumps, engines and elevators as well as agricultural machinery. The Commonwealth Statistician pointed to the substantial machinery import volumes in 1906 as evidence of the opportunity for local manufacturing, but this overlooks the fact that these imports were spread over a multitude of different types of equipment with only a small market

for most (CBSC 1908). The direction of technological change, until the 1970s, favoured high-volume production of standardised machinery – in particular, the capital-intensive mass production of standardised components to narrow tolerances, which also provided economies at the assembly stage. Attaining even moderate markets for most machinery would depend on the expansion, and mechanisation, of other industries but the prospects for getting a large enough market to compete with overseas manufacturers of the high-volume standardised equipment such as agricultural machinery were poor.

The relatively large size of Metals and Machines may seem at odds with the limited demand for producer goods in the Federation decade but one reason for its size was the stimulus provided by railway building. With only a single government-owned rail network in each state, railways' demand was for relatively standardised goods, including rolling stock and locomotives, along with other heavy engineering. From the 1870s, governments produced an increasing volume of their requirements in their own railway workshops – large, technologically advanced establishments that performed both maintenance and manufacturing. These workshops employed almost 15 000 workers by 1910, and accounted for around 20 per cent of the output in Metals and Machines. In an environment with few other large markets for machinery and metal products, the railways' demand provided a substantial boost to Metals and Machines.

The Metals and Machines group also included metal materials production. In 1910 this was limited to small-scale pig-iron manufacturing and the base-metal smelters discussed earlier. The development of a modern iron and steel industry in the years between 1907 and 1914 was a qualitative change. Unlike base-metal smelting, the iron and steel industry produced finished intermediate materials. It was the first of the major intermediate materials industries to develop in Australia. With its large-scale, modern plants incorporating the latest overseas technology and its linkages to a range of metal-using industries, the iron and steel industry has figured prominently in accounts of Australian industrialisation. In view of the limited market for producer goods, and therefore for materials such as steel, before 1939, it is worth considering the market expectations of the two new manufacturers, BHP and a forerunner to AIS. Hughes (1964), in her analysis of the industry, documents the importance of government railway building. Steel rails were the first product each manufacturer produced, after securing government contracts. Structural steel and other shapes, mainly for the foundry and heavy engineering trades, were added soon after.

World War 1 had a mixed impact on industrialisation. By comparison with World War 2, it relied more on men than munitions and Australia was more distant from the battlefronts. As a result, the war materials boost to

demand was more muted. Trade in imports and exports was disrupted and the latter, along with a drought during World War I, had a negative effect on local demand, while import replacement of some final products was also restricted by local industry's inability to supply the necessary capital goods and intermediate materials (Forster 1953). With capacity already in place by the end of 1914, the iron and steel industry was an exception and the war gave it a valuable learning period free of import competition. But market size remained a problem for the industry, even after BHP acquired its smaller competitor and rationalised production. Once BHP integrated forwards to develop metal-using industries in the interwar period, it was able to more fully utilise its capacity. The iron and steel industry went on to become internationally competitive by the late 1950s – a true success story. However, it did not invest in additional capacity to serve export markets and eventually began to run down its plants as the company – like much of the economy – shifted to natural resource exports.

As BHP's experience illustrates, large-scale production of standardised producer goods and materials depended on the gradual development of other industries that used these products. By the end of the 1930s, the range of intermediate materials had expanded. BHP's development of steel-using industries, paralleling the Collins House Group's forward integration into base metal-using industries, was not the only progress marker. Textile production developed from the 1920s onwards (Forster 1964); production of heavy chemicals and heavy and fine paper began in the 1930s (Schedvin 1970). By 1939 Australia had made at least tentative beginnings in most major intermediate industrial materials other than newsprint. Schedvin (1970) also identified qualitative changes in the engineering and machinery industries that were critical in equipping industry to respond to the strong stimulus of World War 2, although government control of the economy, and the priority given to production of war-related materials was also important (Butlin & Schedvin 1977). After the war, though, it was consumer expenditure that underpinned industrial development, with the rise of new consumer durables goods industries such as electrical goods and of the motor vehicle industries, which had strong linkages to other Metals and Machines industries as well as to the Chemicals group.

Consumer goods and the consumer society

Australian manufacturing at Federation was dominated by consumer goods industries. The Food and Drink, and Textiles and Clothing groups were two

of the largest groups in the sector. Toiletries and soaps, and candles were among the primary products in Chemicals; and newspapers were the major product in Paper. This dominance of consumer goods industries in part reflects the limited stimulus from the export sector and the limited demand for producer goods early in the century, but it also reflects strong household demand due to Australia's relatively high average income and to changes in household consumption patterns associated with the early stages of the development of a consumer society. Whitwell (1989) published an important exploratory monograph on the development of Australia as a consumer society more than 20 years ago, but historians and economic historians have only recently begun to explore the implications of this development (Crawford 2010; Merrett & Ville 2011). For Whitwell, the distinguishing characteristic of a consumer society was a higher level of discretionary spending and, perhaps more importantly, a higher proportion of Australian households that engaged in discretionary spending. Discretionary spending is difficult to define because expectations about what was necessary have changed over time, but the implications are more readily discerned in changes to the pattern of consumption.

The first stage in the emergence of the consumer society was an increase in the variety of foodstuffs purchased. In part this represented the replacement of household production with commercially processed foodstuffs, such as jams, pickles, smallgoods, biscuits and other products. The impact of this growth in discretionary consumer spending on the development of Australian manufacturing was already evident in 1906. Industries separately itemised and clearly producing discretionary items – biscuits, jams and preserves, confectionery, beer and tobacco products – accounted for almost half the employment in the Food and Drink group. And in 1910 the group itself accounted for almost a quarter of manufacturing output – equal to Metals and Machines. Most local Food and Drink manufacturers had natural protection afforded by transport costs and, in some cases, perishability but the group also had much higher output per worker than the sector as a whole. This high productivity was due in large part to the adoption of modern mass production technology in flour milling, brewing and sugar refining in the late 19th century, along with CSR's heavy investment in sugar milling and the beginnings of mass production in fruit and jam preserving, all of which were important industries in the food and drink class by 1910 (Hutchinson 2001). The group did have some laggards: productivity in confectionery, for instance, was below average in 1910 but had caught up by 1929 (Table 13.2). With improvements in packaging technology – mass-produced cans and

bottles – the array of discretionary, higher-value-added foodstuffs continued to increase. Canned fruits and meat, bottled spreads and processed cheese production grew in the 1920s and 1930s; then, as refrigerators became more common in the post-1950 era, new frozen foods, smallgoods and other refrigerated products were introduced. Food and Drink did not grow as fast as other industry groups after 1929 because consumers directed an increasing share of their discretionary spending to other items, but it had strong productivity growth and its productivity was still above the sector average in 1967–68.

The beginnings of a consumer society also underpinned the growth of the Textile and Clothing group. This was the third largest group in 1910, but its title was something of a misnomer. Footwear was a substantial part of the group from the outset, employing more than 13 000 hands by 1906; but clothing was the main industry in the Federation decade, accounting for most of the remaining 62 000 employees in 1906. The woollen textile industry was in its infancy, producing only small quantities of coarser flannel and tweed, along with a very small quantity of blankets, while the cotton textile industry did not develop until the 1920s (Forster 1964). Similarly, footwear relied heavily on imported materials. The local tanning industry specialised in the coarse leathers that were used on the soles of boots and shoes, and only began producing finer leathers for uppers in the early years of the 20th century (CBCS 1908).

Ready-made clothing grew partly at the expense of the bespoke trade favoured by the more affluent. More important, though, was the increased clothing consumption of the less affluent. In 1900 ordinary working people owned very few sets of clothes; some items such as men's work trousers were purchased from a nascent ready-made clothing industry with the evocative official Census title of 'slop clothing' but most were made in the household. Over time, household production was replaced by ready-made clothing, and ordinary working people purchased more sets of ready-made clothing. Brand-name manufacturing was important in developing the market for ready-made underwear and hosiery. Bonds began production of knitted goods towards the end of World War I; and in the 1920s companies such as Kaiser and Prestige began local production of brand-name hosiery (Forster 1964). In shirts, manufacturers' brand names also became important but in other ready-made outerwear, the department stores played a critical role. In the 1880s most department stores had fabric departments as well as dressmaking and tailoring departments but from around 1900 they also established their own ready-made clothing factories. By the 1920s their catalogues emphasised

ready-made outerwear, although in a bid to win over the bespoke trade, they also offered the option of customised sizes or colours.

As Table 13.1 shows, labour productivity in the Textile and Clothing group was well below average in 1910. When individual industries were separately reported for the period 1929–30, it was apparent that this was primarily due to low productivity in the clothing industry (Table 13.2). The low productivity in clothing was partly because tailors and dressmakers were included in the industry, but, despite their declining importance as the ready-made industry captured more of the growing clothing market, the productivity gap in relation to the manufacturing sector average remained. The fundamental problem for this industry was that, even when it manufactured a small range of standardised products, it had limited scope to improve labour productivity by using more capital equipment. The takeovers, rationalisations and focus on brand-name products initiated by Dunlop's diversification from 1962 onwards did not have a great impact. The industry narrowed the gap in the 1960s but its productivity was still only 75 per cent of the sector average by 1967–68. Of course, clothing also employed relatively cheap labour, relying on female workers, including outworkers, and on child labour in the early years of the century. In 1967–68, after child labour had been dispensed with, the wages cost per clothing worker was still only 66 per cent of the manufacturing average (CBSC 1969). This, though, was not low enough to make the industry competitive with imports from low-wage economies. The growth of Textile and Clothing added greatly to employment, including employment of groups less likely to have found jobs in other sectors, but it remained a drag on manufacturing-sector productivity and, with the end of import licensing in 1960, the industry became a frequent visitor to the Tariff Board.

Consumer durables, intermediate materials and producer goods

The growth in spending on ready-made clothing and processed foodstuffs, along with consumer goods from other industries, constituted the first stage of the development of a consumer society, and helps account for the size of the Food and Drink and Textile and Clothing groups in 1910, and even in 1939. The next stage was the growth in discretionary spending on consumer durables. This stage had an even greater impact on the structure and size of Australian manufacturing. It is the stage highlighted by Whitwell (1989), Merrett and Ville (2011) and Snooks (1994), because it involved qualitatively

different consumption patterns, underpinned by a growth in household incomes and household borrowing. In the 1880s the only durables most households owned were furniture, pots, pans and eating equipment, and perhaps a lamp. Pianos were the domain of the relatively affluent. Two new durables, bicycles and sewing machines, were within the reach of a somewhat wider market, but most households nevertheless owned few consumer durables. Those they did own were seldom replaced or updated so durables spending was low, as evidenced by the relatively small size of the furniture industry – an industry that has been aggregated with the Wood group in Table 13.1, because furniture alone accounted for only 2 per cent of manufacturing output and 3 per cent of employment in 1910.

Consumer spending on durables began to increase in the 1920s with the introduction of more mass-produced and affordable items, beginning with the motor vehicle and household electrical goods, such as jugs, toasters and radios. The range of durables continued to expand in the 1930s and more especially from the 1950s onwards. Equally important, a succession of new models provided scope for consumers to replace durables they already owned. Increased consumer spending on these durables was contingent initially on the development of new consumer finance institutions – the hire-purchase providers – that emerged in the 1920s. But rising real incomes were also important. Increased consumer durables spending in the post-1945 boom transformed Australian manufacturing through its direct impact on durables industries and its indirect effect on a wide range of producer goods and materials industries that supplied the inputs.

Local production of the new generation of consumer durables, along with petroleum and more particularly petrochemicals, was quickly dominated by multinationals providing a conduit for technology transfer (Merrett, this volume). Local electrical goods production and motor vehicle assembly began in the 1920s and are among the important qualitative changes identified by Forster (1964) for that decade. The motor vehicle industry's subsequent move towards full local production, and the electrical goods industry's increasing array of products had an indifferent productivity outcome. Table 13.2 shows that in 1929–30, labour productivity in the infant motor vehicle industry – basically still an assembly, body-building and simple component industry – was below the sector average; in 1959–60, after shifting to full local production with strong government encouragement, motor vehicle productivity fell a little further behind the sector average. Productivity in an electrical goods category, wireless and amps, was not much higher. As with clothing, the inclusion of repair workshops in the data for these two industries depressed

recorded productivity. But these two industries, and especially motor vehicles, shared with the Chemicals group another, more fundamental problem.

Chemicals delivered the strongest labour productivity growth of any group, as it moved from production of simple toilet preparations, fertilisers and paints to a wide range of basic chemical feedstocks and intermediate materials. The expansion of chemical intermediates in the 1930s lifted labour productivity to 60 per cent above the sector average by the end of the decade. Output and productivity growth were even more dramatic in the 1950s and early 1960s as new petrochemical plants were added. By 1967–68, labour productivity in Chemicals was more than double the sector average (CBCS 1941, 1969). However, this extraordinarily high labour productivity, achieved in part by the use of highly capital-intensive technology, did not ensure internationally competitive production costs. With an array of evidence pointing to an Australian cost disadvantage in chemicals from the late 1950s, Parry (1974) conducted a survey to determine the extent and causes of this disadvantage in the early 1970s. He concluded that higher input costs played a role for some products but the main reasons were the installation of suboptimal-scale plant, and the inability to operate those plants at full capacity. Some underutilised chemical plants were reported to be as small as 5 per cent of world size. Suboptimal and underutilised plants were the result of Australia's small market size, but Parry argued that the impact of this was exacerbated by the presence of multiple, competing plants to serve the small market. For instance, the petrochemical feedstock ethylene exhibited strong economies of scale. In the late 1960s costs were reduced by more than 30 per cent when plant size increased from 50 000 tonnes to 300 000 tonnes, although most of the gains were exhausted by 200 000 tonnes. Since Australian productive capacity was 170 000 tonnes, there was the potential (with full utilisation) to capture most of the available economies of scale but Australia's capacity was split between two smaller plants (Parry 1974, pp. 227, 231). The resulting higher costs were borne by a range of downstream industries.

Consumer durables, especially motor vehicles, exhibited some similarities. Stubbs (1972) found that, as in petrochemicals, the optimum scale for motor vehicle production had increased and greatly exceeded the size of the Australian market by the late 1960s, although the main gains were at the lower end of the range. The market could support the manufacture of one vehicle with only a small cost disability but, as with petrochemicals, there were multiple manufacturers. In this case the scale disability was further exacerbated by product differentiation, which meant each manufacturer needed a minimum of two engine plants and separate body tooling to produce a

range of differentiated products, while frequent model changes limited the production runs. As a result, motor vehicle manufacturers, like downstream petrochemical users, came to rely on tariff protection.

Evaluating the outcome of Australia's industrialisation

Industrialisation added a range of new, technically sophisticated industries, including consumer goods, producer goods and intermediate materials, to the industrial base established by Federation. While the changes were initially more qualitative than quantitative, widening and deepening of the manufacturing sector from the 1930s onwards (especially after 1939) resulted in rapid growth in the size of the manufacturing sector. The geographic impact, however, was uneven. New South Wales and Victoria were the main beneficiaries, with manufacturing production of more than \$700 per head by 1967–68. South Australia (once in second place) had slipped to a distant third on \$565, followed by Tasmania and Western Australia. Queensland's production per head was less than half the level of the more populous states (CBCS 1969). The lead developed by the most populous states suggests that, as transport improved and more manufacturers served a national market, they located to reap the advantages of agglomeration as well as proximity to a major market. State governments tried to influence location decisions, offering a range of inducements to attract manufacturers and promote industrialisation. South Australia's program was perhaps the most systematic and certainly the most publicised but most states engaged in similar practices and it is not clear that these had any impact on the overall distribution of manufacturing (Stutchbury 1984).

While not all states shared equally, industrialisation met the federal government's objectives of providing a massive boost to employment, allowing Australia to attract the migrants that helped boost its population from under 4 million in 1901 to more than 12 million in 1968. By the late 1960s, manufacturing provided employment for more than a quarter of the Australian workforce. Industrialisation had depended heavily on the domestic market. In industries such as construction materials, and food and drink, imports had long been excluded by natural protection (and subsequently boosted by quarantine protection for some food and drink products), although falling transport costs did begin to erode this barrier by the late 1960s. For many other industries, though, development depended on import replacement. The resulting level of import penetration by the mid-1960s was extraordinary.

Imports comprised 0.2–10 per cent of the market for most food and drink products and for other consumer non-durables (the exceptions were margarine, soaps and toilet preparations). Imports had a 10–30 per cent share of the market for many other product categories, but they comprised 30–40 per cent of the market for only a small number of products: some chemical products, pulp and paperboard, television and electronic communication, and man-made fibres. Products for which imports supplied more than 40 per cent of the market were even fewer and of these cotton textiles and shipbuilding were the only ones where imports competed with a full local manufacturing industry; the others were aircraft building and specialised products such as photographic and scientific instruments (BIE 1981, pp. 84–5).

While the low level of imports in the 1960s indicates a highly insulated manufacturing sector, the growth in manufactured goods exports in the late 1960s provides strong evidence that some industries had become internationally competitive. Export classifications differ from production classifications but Pinkstone (1992, p. 380) estimated that by 1972–73 manufactured exports accounted for more than 22 per cent of exports, with more than half of this in elaborately transformed goods. Machines and Metals (an export category that excluded metal manufactures such as iron and steel and non-ferrous metals) was the main contributor but we know very little about what the products or firms were. These were the quiet achievers in a diverse industry group.

In charting the progress of industrialisation, this chapter has used relative labour productivity to differentiate between strong and weak contributors within the developing manufacturing sector, since labour productivity (along with the participation rate) is the proximate determinant of GDP per capita. By this criterion, the development of the sector as a whole eventually yielded benefits. In the Federation decade manufacturing was a weakling, with labour productivity of less than half the economy-wide average. This did not change greatly until the 1930s, but thereafter the sector's labour productivity growth was well above average and by 1967–68 its labour productivity was at about parity with the economy as a whole.² This was a dramatic transformation for a small economy whose comparative advantage lay in natural resources, and whose industrialisation had depended on an import-replacement strategy and domestic demand. It was also a major

2 This was calculated, for consistency, by using factory census data throughout to calculate manufacturing-sector productivity, and conventional measures of GDP per worker for economy-wide productivity. It is necessarily a crude measure, with no attempt to adjust for full-time equivalent workers.

achievement when we remember that the manufacturing sector carried some poor performers, as well as those whose recorded performance was depressed by the inclusion of small, low-productivity repair factories in the official data.

Labour productivity in manufacturing was boosted in the 1950s and 1960s by the growing importance of highly capital-intensive industries. For the economy as a whole, long-term performance depends on the productivity of both capital and labour. For this reason, TFP is sometimes the preferred measure of performance. TFP estimates the contributions of more labour and more capital, to derive a residual often termed technical progress. By this measure too, manufacturing performed indifferently to the 1930s, and strongly thereafter. Haig and Cain (1983) estimated that manufacturing's TFP increased by 0.9 per cent per annum in the 1920s, rising to an impressive 3 per cent in the 1950s, although Lydall (1968) found the TFP growth for a subset of industries varied widely in the 1950s. The BIE found strong growth in TFP, ranging from 3.6 to 4.9 per cent for five-yearly intervals from 1954–55 to 1969–70, with returns to scale accounting for much of this (BIE 1986, pp. 62–3). By all these criteria, then, industrialisation served Australia well, notwithstanding that the development of some industries acted as a long-term drag on productivity. Most importantly, as McLean (2013) has emphasised, industrialisation generated benefits at a time when there was a hiatus in the contribution of the natural resource sector.

Deindustrialisation: manufacturing as a postscript?

From the mid- to late 1960s the role of manufacturing began to change. The change was slow initially, and the trend was masked by changes in the definition of manufacturing in the official data in 1968–69 and volatile economic cycles in the early 1970s, but the long-term results are clear – manufacturing employment fell from a high of almost 1.5 million in 1972–73 to less than 1 million in 2010–11; the decline in its share of employment was much larger. With investment in new technologies and methods, this shrinking labour force produced a higher real output most years and recorded an overall gain in real output of around 20 per cent from 1967–68 to 2010–11. However, with other sectors growing more strongly, manufacturing's share of GDP declined to 8.2 per cent in 2010–11, a level it had not seen since 1869 (ABS 2012i; Butlin, Dixon and Lloyd, this volume).

Australia's deindustrialisation was not unique. The relative importance of manufacturing has declined in other developed economies too, in part because

services now absorb a bigger share of their consumer and government spending, and in part because newly industrialised nations have won a bigger share of the spending on manufactured goods. However, Australia's deindustrialisation was also impacted by distinctive factors, discussed more fully in other chapters of this volume. The natural resource sector from the late 1960s onwards resumed its 19th-century role as Australia's growth engine. Periods of strong investment and export growth in natural resources eased the long-standing concern over Australia's balance of payments that had provided an important, secondary reason for import-replacement policies since the 1930s. Natural resources contributed less to employment growth but, with a reassessment of the population-growth objective and lower rates of immigration since the early 1970s, employment in other sectors (most notably parts of the service sector) was poised to take up much of the slack. In short, beginning in the late 1960s Australia's policy objectives no longer depended on an expansion of manufacturing (Keating, this volume). On the contrary, the high cost of some manufacturing industries – and the protective regime that had fostered their expansion – was seen as a threat to the natural resource sector through its impact on living costs and wages. Not surprisingly, tariff reform and the shift to managed, and then floating, exchange rates were prominent in Australia's microeconomic reform program of the post-1970 period. These reforms aimed to make the Australian economy more responsive to both local and global market forces (Borland, this volume). Other developed countries had similar reform programs, but none began with a regime of such high import protection for some manufactured goods. Australia's dismantling of this regime, along with the growth of its resources sector, helped impart a distinctive pattern to its deindustrialisation.

One major outcome was a change in the geographic distribution of industry. The impact of deindustrialisation was felt least in South Australia and Tasmania. These states were less industrialised than the national average in 1967–69, but, along with Victoria, their manufacturing sector's share of gross state product was above the national average, in 2009–10. New South Wales was about the national average while the other smaller states fell to well below average (ABS 2012i). These differences reflect myriad local factors as well as the uneven rate of deindustrialisation across industries: some industries withered; others survived; and yet others thrived, often by serving global markets.

The highly protected, labour-intensive industries withered under the twin pressures of reduced protection and the increased competitiveness of newly industrialising countries. The prime examples are industries within

the Textiles and Clothing group. In 1967–68 they collectively provided more than 9 per cent of the manufacturing sector value; by 2010–11 their contribution had fallen to just 3 per cent (CBSC 1969; ABS 2012i). Mass-market companies such as Pacific Brands outsourced production to overseas manufacturers or shifted their own production offshore to remain competitive; smaller clothing manufacturers such as Yakka survived by developing brand-name reputations in high-end or niche products but they increasingly found they had to source both textiles and finished products overseas to reduce costs, with flow-on effects for the local textile manufacturing industry (Yakka Pty Ltd 2003).

In contrast to Textiles and Clothing, Metals and Machines³ almost held its own in the new environment, accounting for 44 per cent of manufacturing value added in 1967–68 and 38 per cent in 2010–11 (CBSC 1969; ABS 2012i). However, the composition of this class has changed dramatically. The motor vehicle industry contracted, and is still contracting, under pressure from reduced protection and the rise of new, lower-cost producers; for the steel industry – once internationally competitive – contraction was due more to market forces, although the unwillingness of governments to provide offsetting protection made this inevitable. But against the highly publicised plant shutdowns in these two major industries, some machinery and equipment industries have expanded. These industries were the quiet achievers of the 1960s boom in manufactured goods exports, and appear to have sustained that role. Civil engineering and telecommunications equipment led the way with exports of around \$1 billion each in 2012, but they were followed by a wide range of other machinery and equipment products, including computer parts and accessories, heating and cooling equipment, and mechanical handling equipment (DFAT 2012a). While imports of standardised industrial and consumer equipment have increased, local machinery and equipment firms are thought to have thrived by serving niche or specialised markets at home and abroad (Clark, Geer & Underhill 1996). Other high-value-added industries, such as pharmaceuticals and medical instruments, have also begun to build sizable exports. This growth in exports of complex manufactured goods is commonly seen as evidence of the success of the new policy environment, although it has come at a cost, as some export-dependent firms have faltered under pressure from the global downturn and a high Australian dollar.

3 This class was divided into four separate industries in the new classification. Their collective contribution in 2010–11 is reported here.

The metal-processing industry also expanded after 1968 and made a major contribution to the growth in manufactured exports. The linkage between the growth of this industry and the mining boom is self-evident, but it is important not to exaggerate the impact of the mining spin-off for manufacturing. The vast majority (87 per cent) of Australia's mineral-related exports in 2011–12 was still classed as a (mostly unprocessed) primary product export; the residual was classed as a manufactured product export, but it was overwhelmingly as simply transformed, rather than finished, products (DFAT 2012c, pp. 28–9).

While the Metals and Machinery group almost held its own in the new environment, due largely to the performance of two very different industries – machinery and equipment, and metal processing – the Food and Drink group has thrived. In 1967–68 it accounted for 12.6 per cent of manufacturing; by 2010–11 much the same industries almost doubled their share of manufacturing output (CBSC 1969; ABS 2012i). On the surface, this looks like a return to the late 19th century when manufacturing was dominated by food producers who relied on natural protection and a ready supply of primary commodities to serve the local market. The reality is rather different. With the decline in transport costs, many of these industries are now exposed to import competition. And, like the machinery and equipment manufacturers, some have responded by tapping into export markets. Food and drink exports are now roughly three times the exports in textile fibres, a classification that includes Australia's 19th-century mainstay, raw wool, as well as raw cotton (DFAT 2012a). Food and beverage exports do include industries that carry out simple processing of standardised rural commodities. Frozen meat, for instance, is the largest single processed-food export. As a result, the food and beverage industries are often seen as part of the resource sector – an impression reinforced by the official classification of food and beverage exports as primary exports, distinguished only by whether they are unprocessed (live sheep) or processed (e.g. meat). Yet exports of higher-value-added, differentiated food and beverages such as specialty cheeses, milk powder preparations, beer and especially wine, have also grown (DFAT 2012a). Manufacturers of these products needed to be innovative and build brand reputation to win their domestic and global markets. In short, the extraordinary growth in the relative size of the food and beverage industry over the last 40 years should not be considered as simply a reflection of the bounty of Australia's natural resources.

More generally, despite the natural resource sector's return to the role of growth engine for the economy since the late 1960s, industrialisation has

not become simply a postscript to a story of resource-based development. Industrialisation played a critical role when the resources sector was quiescent, from around 1900 to the late 1960s and, while manufacturing is now a relatively small part of the economy, it continues to make a vital contribution. It continues to provide a wide array of goods that are essentially non-traded – building materials and some food stuffs, for example. It has also evolved into a less labour-intensive and more knowledge-intensive sector, and makes a strong contribution to productivity growth as well as exports.

Big business and foreign firms

DAVID T. MERRETT

Introduction

This chapter explores the interconnected themes of big business and foreign firms. By the end of the 20th century, one of the principal institutions in Australia's market economy, the firm, had undergone a sweeping transformation compared with what it had been before 1900 (Ville, this volume). A group of several hundred firms produced a disproportionate amount of GDP, employed around 30 per cent of the workforce, undertook most of the R&D, and were the leading exporters and multinationals. Moreover, this pool of large firms had spawned global giants, including Rupert Murdoch's News Corporation, the Lowy family's Westfield and, of older lineage, the resources companies BHP Billiton and Rio Tinto. Other smaller companies, such as CSL, Cochlear and Ansell, had risen to become world leaders in their markets. The purpose of this chapter is to describe and explain this transition, whereby an economy overwhelmingly populated by small family-owned and operated firms serving local markets in the mid 19th century became one dominated by large, publically listed corporations with national and in several instances international operations.

Business history is a recent addition to the broad church of Australian economic history. Scholarship in this field has been influenced by conceptual models developed overseas, particularly through the ideas of Alfred D. Chandler about the rise and growth of very large firms. His work on the United States (1962, 1977) and a comparative study of the United States, Great Britain and Germany (1990) stimulated business historians in other countries to explore their own national experiences (Fruin 1992; Schmitz 1993; Chandler, Amatori & Hikino 1997; Amatori & Jones 2003; Wilson & Thomson 2006). Most of these studies took a Chandlerian approach and generally their findings validated his generic explanation. However, Chandler's argument about the extent of the differences between the American and European systems

of business and the superiority of the former over the latter has been more controversial (Hannah 1991, 1995). Australian researchers, notably Ville and Merrett (2000) and Fleming, Merrett and Ville (2004), drew on and extended Chandler's methodology, giving it a local flavour and expanding their investigation to cover all sectors of the economy. As a consequence, a defining characteristic of the recent study of big business in Australia is its comparative orientation, framing the questions of 'what's the same' and 'what's different' about the rise and impact of big business in this country. Not surprisingly, given the great differences between Australia and the leading economies of the northern hemisphere in terms of their respective populations and stages of industrial development, this country turns out to have been a special case.

The chapter proceeds in a series of steps, reflected in a division of six main sections. The first section provides a definition of big business, followed by a brief overview in the second section of the key characteristics of big business in Australia. The seminal ideas of Alfred Chandler concerning the origins and evolution of big business are discussed here in the context of Australian experience. The third section explores the genesis of big business in Australia. Chandler's explanation of the initial rise of big business, or more precisely of large industrial enterprises, in the United States does not transfer easily to the Australian experience. Australia's story is different because many of its largest companies were located outside manufacturing, primarily in services. A more nuanced explanation of the rise of big business is required. The fourth section explores Australia's experience in the light of Chandler's suggestion that American industrial corporations followed a sequence of distinct strategic postures, and adaptive organisational designs, to survive and grow. This discussion also raises the question of where Australian business has stood in relation to the different forms of 'capitalism' associated with the character of big business in the United States, Great Britain and Germany. The author suggests that Australia did not fit exactly into either the American or British ideal types of 'competitive' and 'personal' but rather it shifted over time, with a decisive break in the latter part of the century, from sharing lots of characteristics with the British model to becoming more like the American one. This transition occurred at a time when serious questions were being raised about whether America's giant corporations were still the optimal engines of growth in a globalising world.

Australian big business was heavily populated by foreign firms that invested in local production and sales operations. The fifth section discusses the relationship between their presence in Australia and the poor performance

of those locally based firms outside the resource sector in winning export markets or becoming successful multinationals.

The chapter concludes with a discussion of the implications of the rise of big business for economic performance. Did big business contribute to or pose a drag on national prosperity? Opinions on this issue are sharply divided. Chandler (1977) offers an optimistic view: the rise of the visible hand of management increased efficiency and productivity in America. The importance given by Chandler to the firm's internal capabilities resonates with much of the strategic management literature. However, many critics of big business, ranging from radicals to academic economists working in the industrial organisation field, have denounced the exercise of power by a plutocracy and the reduction of competition in industries with high levels of seller concentration. Big business eventually became so important in the economy that the follies and excesses of its leaders exacerbated the recessions of the early 1990s. Moreover, some corporations became too big to fail, permitting financial institutions to wring concessions from governments during the global financial crisis of 2007–08. Many agree that the relationship between big business and the society in which it operates is complex and evolutionary.

Defining big business

What is big business? The term implies scale. A firm's size can be measured by a variety of metrics: employees, sales, market value of securities and assets. Big business is a term that describes the domination of several industries by a few large firms. However, the essence of the Chandlerian view of big business is that it is far more than a collection of large firms. Rather, it is a new species of business organisation. In shorthand, these corporations are characterised by having a separation of ownership and control, and directors make strategic decisions while operational decisions are the responsibility of hierarchies of salaried managers. Moreover, these businesses coordinate strings of sequential sourcing, manufacturing and distribution processes, and many operate branches in multiple locations. Big business has a transformational effect on an economy when a sufficient number of firms in industries or sectors have acquired a critical mass of resources and capabilities so that the behaviours of these firms shift the way in which the economy works. Chandler (1990) argues that the rise of large industrial enterprises in the world's leading economies took them past the tipping point, leading to a different type of economy before World War 2.

Overview of big business in Australia

There is a large literature on Australian firms that, while adding significantly to our knowledge of Australian business practices, is not directly concerned with the rise of big business as an economy-wide phenomenon (Anon 1963; Merrett 2000, pp. 1–4). Authors range from memorialising family members to university-trained professionals writing commissioned histories and biographies of leading businessmen. Geoffrey Blainey, a prolific author and marvellous storyteller, blazed a trail for later comers including Sue Ebury (2008) and Peter Yule (2001, 2006, 2012). In recent decades, academics have produced many high-quality articles exploring a variety of business history topics in journals such as the *Australian Economic History Review*, *Business History*, the *Business History Review* and *Enterprise and Society*. Journalists such as Trevor Sykes (1988, 1994) have exposed companies' misdeeds and downfalls. Other authors have pooled together data about groups of firms to sing their praises (Pratt 1934), criticised their anticompetitive tendencies (Wilkinson 1914) and examined their share registers to discover ownership characteristics (Wheelwright 1957) or to track mergers (Bushnell 1961).

As mentioned above, Chandler reframed the research agenda in business history by casting his net beyond the scope of a firm or industry. He sought to understand the dynamic of change within the most important sector in the economies of the United States and Europe, manufacturing. What environmental factors facilitated the first stages of growth of these giant industrial enterprises? His argument, in brief, expounded in *The Visible Hand* (1977), was that two interconnected forces were at work that enabled firms to exploit massive economies of scale. These were, first, the widening of markets resulting from the building of the railways and telegraph, and, second, rapid advances in production technology – particularly in those industries Chandler described as being 'science-based and capital-intensive' – and in the use of electricity as motive power. Early movers or adopters using the bundle of new technologies drove unit costs down as they operated at increasing scale. Giant firms came to dominate industries, buying up weakened rivals and integrating backwards into raw materials and forwards into distribution. Growth continued only if firms adapted. They had to diversify their product range and geographic markets, processing from local and regional to national and global. These changes in 'strategy' required associated adaptations in organisational design, a shift from U-form to M-form or multidivisional structure, and ongoing investments in production technology, marketing and organisational capabilities.

The first attempt to replicate a Chandler-style study of big business in Australia was undertaken by Ville and Merrett (2000). This preliminary study, which surveyed the period 1910–64, was extended by Fleming, Merrett and Ville (2004), who carried the data and argument forward to 1997. The starting point of their project, entitled *The Big End of Town*, was to identify big business across the 20th century. To do so the authors created six lists, based on intervals between 1910 and 1997, of the 100 largest non-financial and 25 largest financial firms. The data on firms came from press reports about companies listed on the local stock exchanges. These data sources provided a consistent measure of bigness, the value of total assets. Other measures, mentioned above, were not readily available. Moreover, firms were allocated into industry groupings. However, as firms increased their product ranges over time, and operated within many different industries, allocating them into a single industry category became increasingly difficult.

What do these data tell us about big business in Australia? Big business, as measured by firms in the lists, was heavily concentrated within particular parts of the economy. Table 14.1 shows the distribution of the top-100 non-financial firms at five dates across the century compared with the contribution of those same industries to GDP. Three industries acted disproportionately as hosts to big business: mining, manufacturing, and wholesaling and retailing: industries B, C and F at the two-digit level of the 1969 Australian Standard Industrial Classification. Firms in these industries shared a common characteristic: all operated with high fixed costs and their unit costs fell sharply as output volume grew. Big firms were most heavily represented in manufacturing and mining, whose combined share in the top 100 rose from 43 in 1913–14 to a peak of 76 in the early 1960s. Thereafter, manufacturing's share fell while a crop of large firms emerged in industries such as construction, transportation, business services and communications in the last third of the century. There was considerable turnover of companies from list to list, with less than one in five firms appearing in three or more. There was a churning of old and new, local and foreign as well as by industry.

Does Australian experience correspond to Chandler's account of the rise of the large-scale industrial enterprise in the United States? The answer is yes and no. The affirmative answer relates to manufacturing. Despite Australia having a much smaller manufacturing sector than the United States or the other leading industrial economies, the largest manufacturing firms in Australia appear in that same group of science-based and capital-intensive industries (Ville & Merrett 2000, Appendix C; Chandler 1990, Appendices). In 1910 manufacturing firms make up 30 of the Australian top 100. They are

Table 14.1 Shares of GDP, and number of firms, in top 100 by industry, 1913–14 to 1989–90

	1913–14		1928–29		1950–51		1962–63		1989–90	
	Share (%)	Number	Share (%)	Number	Share (%)	Number	Share (%)	Number	Share (%)	Number
Agriculture	23.6	9	21.4	6	29.0	1	12.9	—	4.3	2
Mining	5.2	13	1.9	5	2.1	9	1.5	5	4.7	18
Manufacturing	13.5	30	16.9	39	23.7	55	28.3	71	16.3	50
Electricity, etc.	—	9	—	10	1.5	3	3.4	2	3.3	1
Construction	9.6	—	8.3	—	6.3	—	7.8	2	8.2	6
Wholesale and retail	16.4	28	17.7	31	14.7	27	14.6	18	14.9	7
Other	31.7	11	33.8	9	22.7	5	31.5	2	48.3	16
Total	100	100	100	100	100	100	100	100	100	100

Note: Major definitional changes affect continuity of industry classification. Data years for firm numbers are 1910, 1930, 1952, 1964 and 1982.

Source: Adapted from Fleming, Merrett and Ville (2004, Table 2.4).

clustered (more than half) in the food, beverages and tobacco subdivision, with the remaining firms scattered across basic metals, paper, glass and leather. By 1964 the composition has altered radically, moving more closely into alignment with the data presented in *Scale and Scope* (Chandler 1990), with a strong swing towards metal refining and fabrication, and automobiles, and with the number of paper, glass and chemical firms also expanding. The food, beverage and tobacco numbers fell absolutely. The negative answer relates to the big business beyond manufacturing. Big business extended well beyond industrial production (Fleming, Merrett & Ville 2004, Table 2.5). The only date at which manufacturing firms are in a clear majority in the top 100 is 1964. In the last quarter of the century, there was a proliferation of firms from previously unrepresented parts of the service sector, some of which were recently privatised government businesses. It was only at the end of the century that mining loomed larger in the numbers than in the public imagination.

Is big business in Australia different from elsewhere? It is highly likely that the split between manufacturing and the rest, and the distribution within manufacturing reflect the particular nature of the Australian economy and the course of its development since 1900. However, any thoughts of Australian exceptionalism must be tempered because most of the studies undertaken overseas have focused exclusively on manufacturing. It may be that a similarly comprehensive collection of firm data in other countries would moderate the connection between manufacturing and big business (Wardley 1991, Table 7). There are good reasons for supposing that parts of the service sector, particularly retailing (Chandler 1962, ch. 5; 1977, pp. 224–39), utilities such as railways, gas and electricity, and finance would also be generous hosts to big business elsewhere.

Fleming, Merrett and Ville also collected data relating to a number of dimensions of the 25 largest firms within the finance sector (2004, Table 2.9; Appendix B, pp. 244–49). A wealthy country with high rates of saving provided rich pasture for financial institutions. Most firms in the top 25 were private banks, known colloquially as trading banks, and government-owned banks. Banking institutions accounted for 70–80 per cent of the assets of the top 25. Three key shifts occurred: government-owned banks increased in number relative to private banks until 1952; life offices grew in number up to mid-century; and non-bank financial intermediaries grew strongly from 1964 onwards. New faces appeared on the list and the rank order changed late in the century because of a combination of the sale of government-owned financial institutions, banks and insurance businesses, mergers among the

leading local banks, and the entry of foreign banks in the 1980s and 1990s. However, despite the rise of new types of financial institutions such as merchant banks, Australia lacked the breadth and depth of bank and non-bank financial intermediaries of countries such as the United States, Britain and France. The rise of big business in Australia was stunted by a commensurate underdevelopment of its financial system (Maddock, this volume).

International comparisons reveal that Australian firms were generally smaller than their counterparts in the United States and European countries from the 1930s onwards (Fleming, Merrett & Ville 2004, Tables 2.12 and 2.14). Likewise, Australian banks were generally much smaller than those in Britain and Canada over the same period (Fleming, Merrett & Ville 2004, Table 2.13). It is not surprising that Australian firms were smaller than those in the United States, whose population was many times larger. However, the existence of larger firms in countries with comparable or smaller populations, such as Canada, the Netherlands, Sweden and Switzerland, is suggestive of there being something 'special' about the Australian experience.

The beginnings of big business

Colonial enterprise had evolved to a point during the previous century where much of the foundations for the emergence of big business were in place. By contrast, Chandler (1997) focuses on a narrower range of contributing factors in the United States' domestic market: the impulse of the railway and telegraph, and new manufacturing technologies and power sources. While there is a link between the expansion of the market in Australia and the emergence of big business, the relationship has a strong local flavour. For instance, the growth of the international market played an important role in the emergence of Australian big business. Improvements in intercontinental shipping and the spread of the telegraph in the late 19th century tied Australian farmers, graziers and miners to expanding world markets. The unit of production in the farm and grazing industries remained family-owned and unsophisticated in an organisational sense. However, firms providing services to these producers became very large. The pastoral finance firms, which dominate the 1910 list, offered a range of services to the sheep and cattle industries, including controlling the auction sales of Australia's wool clip. The largest firms extended their geographic reach by running wool and livestock auctions and having branches in country towns. The trading banks, which were important lenders to the pastoral industry, also moved into the countryside and across state boundaries in search of custom. Mining became a site of big

business as the discovery of new gold and base-metal fields towards the end of the 19th century required large amounts of capital from investors on local and overseas stock exchanges to mine deep underground.

The investments in infrastructure that spurred the growth of United States industrial enterprises were less effective in building an integrated domestic market. Australian governments undertook large investments in railways, posts and telegraph services, and gradually became monopoly providers of gas and electricity generation, transmission and distribution. Did these investments stimulate the growth of manufacturing with national rather than local scope before World War 2? There is little evidence to suggest that it did. For instance, the internal trade data before 1914 show that the movement of goods between the states was only two-thirds of that between Australia and the rest of the world. Moreover, nearly 80 per cent of internal trade was in resource-based products (CBCS 1910b, Table XL).

Why was there so little trade in local manufactures within the newly created customs union? Part of the answer lay in the pattern of railway building and more generally in the nature of ownership of these various utilities. Railways were constructed to link the capital cities with their rural hinterland and not with one another. The construction of lines connecting all the capital cities some 600 miles (965 km) apart – cities holding most of Australia's population – was long delayed and its effect was lessened by state systems using different track gauges. Moreover, most observers have argued that investment decisions and pricing regimes were subject to political considerations rather than commercial criteria. Similar judgments have been passed about the impact of public ownership on the provision of telephone services, and of gas and electricity (Butlin, Barnard & Pincus 1982, Part 4).

An alternative explanation of the emergence of large manufacturing firms in industries such as brewing and chemicals from 1900 onwards is the size of markets in the capital cities. Natural increase and high rates of immigration fuelled Australia's population growth. The cities were a magnet for population, giving rise to a highly urbanised economy. Sydney and Melbourne, in particular, were large cities by world standards. These cities were large enough to permit manufacturers to reap modest economies of scale, and diverse enough to provide economies of agglomeration as clusters of related industries located close together. A sizable set of local markets of high-income consumers anxious for novelty, protected from imports by distance and tariffs, enabled the growth and longer-term survival of large manufacturers (Merrett & Ville 2011, pp. 57–60; Hutchinson, this volume).

A national market for manufactured goods and services already existed to some degree early in the 20th century. It had arisen because of a growing convergence of taste among consumers. Imports probably built national brand awareness ahead of local production. This was most obvious for consumer goods, such as beverages, packaged foods and, by the interwar years, household appliances and motor cars. Aspirations were formed and tastes homogenised by the increased use of marketing via billboards, print media, cinema and radio, and through packaging and labelling. Advertising agencies flourished from before 1914. The buying policies of the large department stores and chain stores such as G. J. Coles enabled firms with strong brands to entrench themselves in product categories. In the second half of the century the development of national supermarket chains and shopping malls with the same collection of tenants reinforced these trends. By the 1990s the range of products and brands offered through the nation's supermarkets were virtually identical. Adherence to technical standards in a wide range of producer goods from the 1920s similarly led to a homogenisation of demand across the country.

How did local manufacturers, located for the most part in Sydney and Melbourne, come to reach the dispersed regional markets? In the United States, Chandler (1977) argues that one reason for the growth of the industrial enterprise was that firms integrated mass production with mass distribution. Merchants, who previously stood between industrialists and their customers, were replaced because they could not provide the level of service required by new types of products. Australian experience was very different before World War 2, with the notable exception of the iron and steel trade that had internalised its distribution system. A traditional reliance on imported manufactured goods led to the development of a highly specialised distribution system in which agents handled transactions between British manufacturers and merchants, and Australian retailers. R. W. Dalton, the senior British Trade Commissioner to Australia, wrote in 1929 that the 'agency trade organisation [in use in Australia] ... is probably larger and more efficient than that of any other country in the world' (Dalton 1929, p. 191). The system of specialist agents that distributed imports worked with equal efficiency in moving goods from manufacturers operating in a single place to customers around the country (*Tait's* 1929).

By the 1960s a national market had emerged. The largest firms had dozens and in some cases many more than 100 offices, warehouses and factories spread across Australia (Block 1967, pp. 186–263). An increasing share of goods production crossed state borders by road, sea and air, with Ansett and

TAA airlines becoming leading players. The fax, barcodes, GPS, shipping containers, and road hauliers and freight forwarders such as TNT and Mayne Nickless were stronger forces of integration than 19th-century railway building.

Sustaining big business through adaptation and innovation

How did firms survive and continue to get bigger once the initial impulse to growth had passed? Chandler observed that the giant firms that came to dominate maturing markets in the United States continued to expand by developing new markets at home and abroad, and diversifying their product base (1962; 1990, pp, 38–45). Continued success relied more and more on the internal capabilities of the firm. These required continuous three-pronged investments in production, marketing and organisational capabilities. R&D spending was critical to the success of innovation. Marketing skills were of equal importance, especially in the consumer product space. The quality of management also became critical as firms became larger and more complex. There also needed to be a fit between the strategy a firm was following and its structure – a shorthand term for a firm's decision-making processes, in particular whether they are centralised on a single product or decentralised to deal with a number of separate products. Management responsibilities and tasks became increasingly specialised – for example, there was a separation of roles between the directors and salaried managers, with many of the latter having had formal training in functional areas at college or university. The modern industrial corporation was portrayed as being far removed from its predecessor, the family firm, whose access to both external capital and talent was constrained by the desire to preserve control.

In *Scale and Scope* (1990), Chandler's comparative study of the world's three largest industrial nations, he revealed distinctive national characteristics of large firms. He described these as 'competitive capitalism' in the United States, 'personal capitalism' in Britain and a hybrid 'co-operative capitalism' in Germany. Australia's experience in the evolution of its firms' internal capabilities, and their direction and method of growth, can be measured against this wider range of historical outcomes.

Using material drawn together in Fleming, Merrett and Ville (2004), some broad generalisations can be made about the internal architecture and growth strategies of Australia's leading firms up to the 1950s. Founding families continued their hold over the ownership and management of Australian

enterprises to a far greater extent than in the United States, perhaps a consequence of having less reliance on equity markets for funds. Australian firms, while increasing the degree of specialised authority, responsibility and accountability through departmental organisation and position descriptions, lagged well behind the largest firms in similar industries overseas. Firms diversified their product ranges but few took the next step to exporting or foreign investment. Those that diversified were slow to adopt the multidivisional or U-form type of organisational structure before the 1960s and 1970s. Managers concentrated their investments in the production side of Chandler's three-pronged capacity-augmenting investments: production, marketing and organisational capabilities.

American firms grew larger by absorbing rivals, known as horizontal integration, and buying out suppliers or distributors, called vertical integration. Merger waves ended with a smaller number of larger firms. Once again, Australian experience was different. Mergers and acquisitions were far less common before World War 2, with notable exceptions such as the consolidations among the banks and pastoral companies, and the takeovers by BHP of Australian Iron and Steel and General Motors–Holden. There were examples of vertical integration but they were less common than in the United States. For instance, oil companies straddled refining and distribution, breweries ran tied houses, and department stores owned factories making furniture and shirts. Some firms used methods other than ownership to exercise control along supply chains. For instance, both BHP and the Collins House Group dominated the ferrous- and base-metal industries through a group of independent companies held together by interlocking directorships and cross-shareholdings.

Inter-firm cooperation was an important feature of Australian business, a mode of behaviour that flourished in the absence of any effective legal restraint on anti-competitive actions before the 1960s. For instance, firms also shared facilities in oil refining and chemical production. Wool auctions were conducted by state-based associations of broking firms. The ubiquitous trade associations whose numbers rapidly expanded in the late 19th and early 20th centuries facilitated cooperation (Freeman 1965). While many commentators have denounced their cartel-like ability to set minimum prices and enforce exclusive dealing agreements, these associations also brought public benefits in the form of distributing technical and marketing information to their members, setting technical standards and providing a forum for dispute resolution.

The second half of the modern century saw significant changes in the character of Australia's largest companies that brought them closer

to Chandler's characterisation of competitive capitalism. Many factors contributed to the shift in strategic orientation and to organisational capabilities and design. Australia's growing population and high per capita incomes provided a larger local market that was becoming integrated. Firms could exploit economies of scale to an unprecedented degree and in a wider range of industries. National coverage became the norm. Even the long-standing state-based beer fiefdoms were swept away in the 1980s by John Elliott and Alan Bond. Fresh opportunities arising from market size, new technologies and changing government regulations brought forth a new crop of important firms, those Fleming, Merrett and Ville classify as 'challengers' (2004, Tables 3.5 and 8.3). Diversification became the norm. This is best shown by the experience of five of the six that appear in every list, the 'corporate leaders' over the period 1910–97. BHP went from mining to steel production and back to resources, including energy; British Tobacco (Australia) split off as Amatil, manufacturing soft drinks and snack food; CSR extended from sugar to building products and oil; Dunlop moved from producing rubber to becoming a widely diversified manufacturer; and Burns Philp morphed from an island trader and retailer to a global food additives company.

Most firms that diversified transformed their organisational design, shifting from a centralised structure to one based on product divisions – known as the M-form structure. A comprehensive study in the 1980s comparing and contrasting United States and Australian manufacturing firms showed that both had similar levels of diversification and divisional organisation (Capon et al. 1987, Table 4). Some firms, such as BHP, grew organically, accumulating resources from retained earnings and approaching banks and share markets for funds. Others, such as Elders IXL, expanded by acquisition and merger, a strategy whose popularity reached a peak in the 1980s before the widespread collapse of conglomerates put together by debt-fuelled 'corporate raiders'.

As firms got bigger so there were changes in who owned and managed them. The balance of control of firms slipped slowly away from founders and their families towards shareholders. The pace of change varied between industries and among firms within the same industry. This transition took place faster in those industries whose capital requirements outpaced retained earnings. General pressure for change also followed from government policy in the last decades of the 20th century to impose a regime of corporate governance that protected and privileged the rights of shareholders. However, not all shareholders had similar degrees of influence. Those groups of shareholders with around 10 per cent of voting stock in an open register, a

common occurrence, could retain effective control of strategic decisions and distributions to shareholders.

Founding families of long-established businesses usually had their ownership diluted and handed over control to professional managers. The practice of management altered as the knowledge and skills required to operate large, technically sophisticated and complex organisations increased considerably. Middle and senior management required a wider range of functional expertise as the years passed. Where once native intelligence and on-the-job training might suffice, managerial competency came to rely on formal education from colleges and university (Wilson & Thomson 2006, Parts III and IV; Wright 1995). Moreover, the ratio of 'managers' to other workers rose sharply in the biggest firms. For instance, in 1994–95 those manufacturing businesses employing more than 100 people had 59 per cent of all employees and 75 per cent of managers (Productivity Commission & Department of Industry Science and Tourism 1997, Tables 3.13 and 3.36).

Expansion beyond the national market, however, was a less important source of growth for big business in Australia compared to many other countries for most of the 20th century. By the onset of the first oil shock in 1974, Australia's ratio of merchandise exports, the majority of which were bulk commodities, to GDP was no higher than it had been in the 1930s. Australia's share of world merchandise trade was no higher in 2011 than 1971 despite a number of favourable developments (ABS, *Overseas Trade Statistics*, various dates; WTO, Statistics Database, various dates). These included government policies to facilitate exports, significant reductions in barriers to trade and investment both here and abroad, reductions in domestic product and labour market distortions, and a strong upswing in the terms of trade (Pomfret, this volume). The realignment of the world economy from West to East seemed to have presented more threats than opportunities to Australian firms beyond the resource sector.

Why was it that late in the 20th century big business, particularly in manufacturing, struggled to compete in international markets? Australia's trade, specifically its composition, volume and direction, has been driven by comparative advantage enjoyed by resource-intensive industries. Could local manufacturers overcome the disadvantages of high cost and distance to hold their own against competition from imports and to win markets abroad? The significant reduction of the size of the manufacturing sector after the lowering of trade barriers suggests that many firms could not. Lower wage costs in Asia dealt a devastating blow. However, it was not the whole story. While the sets of resources and skills within big business were undoubtedly superior to

those of 50 years earlier, they had not made up ground on the improvements taking place in firms in other rich countries or in emerging markets.

In contrast to the ongoing struggle to lift exports, there was a sudden upsurge in the number of firms undertaking foreign direct investment from the 1980s onwards. Older multinational firms such as banks and life offices expanded their presence overseas while miners, construction firms, retailers and transport firms ventured abroad for the first time. Only a handful of Australian manufacturers had taken their operations offshore before 1939. More and more had done so by the late 1960s. However, by international standards these were still puny affairs. The offshore operations were predominantly sideshows to domestic operations, more likely to be sales offices rather than factories, and were huddled in the familiar territories of New Zealand, Papua New Guinea and Fiji (Merrett 2002b; Dick & Merrett 2007).

Recent studies of Australian multinationals have focused on their small number, the narrow geographic spread of their activities, and the relative lack of sophistication in their organisational design relative to multinational enterprises in other small, rich and industrialised countries (Merrett 2007b). The factors holding back the emergence of these enterprises in non-resource sectors were broadly similar to those explaining the difficulties faced by manufacturing firms in finding export markets. Operating in a small distant market with high costs was a handicap. To succeed, firms had to have the internal resources to overcome comparative advantage favouring resource-based activities.

This wave of foreign investment ended unhappily for most of the participants. Low profits and losses abroad led to divestment in many cases. Zalan and Lewis (2007) argue that Australian managers were ill prepared to run operations overseas based on a study of 11 of the largest Australian multinationals. The sources of success of these firms in the domestic market came particularly from 'strategic assets', including local brands, control of distribution systems, and high barriers to entry. These were not easily transferable into new markets. These firms grew at home by expanding into non-related activities, becoming conglomerates rather than building core strengths in technology and marketing knowledge. Moreover, Australian firms lacked prior experience of internationalisation either as exporters or as multinationals. They failed to recognise their lack of competitive advantage beyond their home base.

Our explanation becomes more nuanced if we study the experiences of individual firms and industries rather than look at population-wide data (Dick & Merrett 2007). There have been some spectacularly successful firms

in the international arena. For instance, Aspro, Kiwi and Helena Rubinstein were three firms established around 1914 that achieved international success as both exporters and multinationals. High local costs and distance from markets, the usual explanations for poor trade performance, were small impediments to their success. Each pioneered a novel product, painkillers, shoe polish and face cream, for which there was widespread demand in the developed world. However, none was able to maintain its success. Over the long haul, these firms slipped back in the race to innovate and market new products, partly because of the limitations of family control and partly due to a lack of resources. All fell prey in the 1970s and 1980s to takeover by larger, better placed American and Swiss companies that continue to manufacture the brands (Merrett 2007b).

The failure of these early multinationals overlapped in the 1970s, 80s and 90s with the rise of another generation of successful outward-looking firms: Ansell making latex gloves and condoms, CSL producing plasma and other products, and Cochlear producing implantable hearing devices. The resources and capabilities of these firms were light years ahead of their predecessors; they were science-based and capital-intensive, with high-end innovation capacity. CSL and Cochlear built on research activities undertaken in government agencies and universities. Each have augmented their R&D, production and marketing capacities through international alliances and acquisitions. Ansell, like Helena Rubinstein before it, has relocated its head office to the United States. How long they remain leaders in their niche markets will depend more on the investments they have made in R&D, production and marketing skills, and the ability of their managers to make the right strategic decisions in rapidly changing industries.

The irony is that as Australian big business moved closer to the American version in the last quarter of the 20th century, its weaknesses were exposed. For reasons discussed elsewhere in this volume, Australia dismantled its comprehensive regulatory regimes of 'protection' in the 1980s (Borland, this volume). Business faced a perfect storm. Manufacturing struggled in the face of import competition, particularly from industrialising Asia, and employed the measures of shedding jobs and offshoring. A newly deregulated financial market gave rise to a credit boom and a property bubble. Before the music stopped in a sharp recession in the early 1990s, a credit-fuelled hostile takeover boom led by what were colloquially known as 'entrepreneurs' had reshaped the corporate landscape.

The gloss had gone from the Chandler story of the competitive strength coming from big business. Critics such as Michael Jensen (1989) turned the

idea on its head. Large corporations were now a source of the United States' declining competitive position in the world. Corporations were too big and bureaucratic to respond effectively to rapidly changing market opportunities and new technologies. Moreover, managers were now portrayed as self-serving 'agents' who promoted their interests above those of the owners, by underachieving and overcompensating themselves. Having internalised the market, especially for the allocation of funds, the mature corporation now required opening up to external market pressure. The way ahead, according to academics and consulting firms, was to split off divisions of corporations as separate companies and to give their managers high-powered incentives, in terms of performance-related compensation, to maximise shareholder value. These ideas took hold in Australia. In response to scams and fraud on the stock exchanges during the mining boom of the 1960s and 1970s, and to the corporate collapses of the 1990s, the government ramped up regulation of business activity by strengthening the corporations and securities law and establishing a corporate watchdog, the National Companies and Securities Commission, in 1979 (Merrett 2002c). By century's end concerns were expressed about the quality of management and the ability of local firms to cope in a globalising world (Report of the Task Force on Leadership and Management Skills 1995).

Role of foreign firms

As a British outpost, Australia received an influx of entrepreneurial migrants. Some operated independently after their arrival. Others called on family and partners in Britain to supply capital and support for business opportunities. Moreover, 19th-century Australia provided rich pickings for investors in what Wilkins (1988) calls 'free-standing companies': the banks, stock and station agents, and shipping, mining and land companies that did business here but had a brass plate and share registry in London. From 1914 onwards, however, the character of foreign firms operating in Australia altered decisively with an influx of subsidiaries of British, American and European manufacturers. For the most part, the parent companies had a commanding position in their home markets and subsidiaries in many foreign countries. Unlike the foreign miners that rushed into Australia in the 1960s to export to industrialising Asian economies, these industrialists came to sell motor cars and television sets to the domestic market.

It was not until the release of government statistics in the 1960s that the full extent of foreign investment, industry by industry, became apparent.

Table 14.2 Foreign ownership of top 100 non-financial and 25 financial companies, 1910–97

	Number in top 100	Share of top- 100 assets (%)	Number in top 25	Share of top-25 assets (%)
1910	31	49	4	22
1930	20	25	3	16
1952	9	12	2	15
1964	36	41	3	14
1987	24	16	2	2
1997	30	22	9	11

Source: Adapted from Fleming, Merrett and Ville (2004, Tables 2.2 and 2.9).

Many parts of the manufacturing sector – chemicals, metals, motor cars and electronics in particular – were dominated by foreign firms (Fleming, Merrett & Ville 2004, Table 2.3). Mining was an important host as well. This picture was the culmination of decades of inward investment that was generally welcomed by politicians and the public.

Foreign companies had figured prominently in the lists of both the top 100 and 25 from the start. Early in the 20th century nearly all of the foreign firms had been British. However, over time, particularly after 1945, the geographic scope widened to include those from Europe, the United States and Japan. As shown in Table 14.2, the share of foreign firms in the top 100 fluctuates over time, falling from a high of 31 per cent in 1910 to a nadir of only 9 per cent in 1952 before rebounding in the second half of the century. Foreign firms were clustered in wholesale and retail trades in 1910 and 1930 and then overwhelmingly in manufacturing, particularly during the 1950s and 1960s (Fleming, Merrett & Ville 2004, Tables 2.2 and 2.9). Foreign-owned financial institutions had a lighter footprint than non-financial firms in terms of both the number of firms and the share of top-25 assets. Australia's long-standing informal barriers to entry by foreign banks and the formal restrictions introduced post-World War 2 until financial deregulation had cut deep.

Fleming, Merrett and Ville (2004, Table 2.3) discuss the dominant role of foreign firms in manufacturing in the early 1970s. These firms were particularly important in the new science-based and capital-intensive industries of the Second Industrial Revolution. Nearly three-quarters of the 980 foreign firms operating factories were operating in the chemical, glass, metals, automobile and other industrial industries. On average, foreign firms generated one-half of the value of output in these industries; in motor vehicles

it was nearly 90 per cent. By the 1960s dozens of foreign firms dominating key industries were household names: Shell, Mobil, Caltex, Esso, British Petroleum, General Motors–Holden, Ford, Chrysler, Volkswagen, ICIANZ, Monsanto, George Weston, Kodak, Philips and Unilever. However, for all their advantages these firms struggled once the tariffs fell and subsidies dried up. Many closed their factories, particularly in car manufacturing and electronics, leaving only sales offices handling imports from cheaper locations.

The influx of so many foreign firms was to have serious consequences for the emergence and performance of domestic firms. An important question is whether their presence strengthened or oppressed the international competitiveness of domestic firms. The current view in the international business literature is that foreign firms may bring positive benefits to the firms with which they interact in host economies (Dunning & Lundan 2008, ch. 16). It is acknowledged that the foreign firms have superior capabilities in the form of technology, brands and general management. Their operations within the local market generate ‘spillover’ effects as knowledge about how these foreign firms operate is acquired by domestic competitors, suppliers and customers. However, an alternate impact appears more probable. Sequencing matters. Foreign firms at the heart of the Second Industrial Revolution, which were first movers into the emerging industries mentioned above, squeezed opportunities for domestic challengers. Foreign firms’ parents had amortised investments in technology and marketing across their global operations whereas the local competitors faced those start-up costs. Consequently, foreign firms have a marked cost advantage operating at similar scale. Moreover, the locals licensed foreign technologies rather than developing their own, further diminishing their ability to compete at home or abroad. The failure of the General Motors–Holden managing director Laurence Hartnett (1964) to independently develop a competitive Australian car in the 1940s is a case in point.

Conclusion

By the end of the 20th century, Australia possessed a collection of large business enterprises that were fundamentally different from anything that was operating before Federation. This chapter has shown that the rise of big business in Australia has not been a linear progression from a world of universally small firms to one of giants. Moreover, big business remains concentrated within certain types of industries. Big business emerged first in services rather than manufacturing, which assumed a dominating position

around mid-century before surrendering its lead in the 1980s. The top-100 firms continue to coexist with tens of thousands of small to medium enterprises who are their competitors, suppliers and customers. This story of these firms' emergence and entrenched position makes more sense being told at the level of industry rather than the aggregate economy.

The story of the rise of big business in Australia has a strong local flavour while being part of a general phenomenon in developed economies. The drivers of big business here as elsewhere have been new technologies and wider markets, which reduced the costs of per unit production and of transport and communication. Manufacturing is important but other industries also spawned large corporations. For instance, BHP Billiton and Rio Tinto have achieved global scale in the resource industry. Large firms have emerged in many parts of the service sector, including construction and utilities. Economies of scale favoured large firms in industries such as banking, insurance and retailing. However, in other industries, such as media and gambling, the number, size and profitability of firms are also influenced by government regulation. Another point of difference is that Australian large firms have relied more on the domestic market than have large firms in similar industries in other advanced economies.

The final question is how has the growth of big business affected the performance of the Australian economy? Fleming, Merrett and Ville (2004) conclude that the stakeholders of big business – shareholders, creditors, customers, suppliers and workers – gained from the profits, productivity and the good jobs (particularly white-collar) provided by the internal labour market practices of big business (Seltzer, this volume). Moreover, these large firms were leaders in R&D and innovation. The question can be put as a counterfactual. Could Australia's 20th-century growth have been achieved with the pre-big business types of business institutions? The answer is clearly in the negative.

Many economists have been critical of an outcome of big business, high levels of seller concentration lessening competition. Many industries were host to monopolies, oligopolies and all sorts of uncompetitive practices. Can we reconcile this situation with the existence of a dynamic and competitive economy? Listed companies earned healthy profits, exceeding the bond rate by an average of 3.4 per cent from 1901 to 1983 (Ville & Merrett 2006, Table 1; Pope 1986, Table 7.) However, there is little evidence that barriers to entry were unassailable or that business earned excessive monopoly profits. Moreover, above-average industry profits generally attracted additional productive capacity (Merrett & Ville 2009, p. 582–5; Merrett & Ville 2011,

pp. 64–5). Fleming, Merrett and Ville (2004) show that many of the leading firms were successfully challenged by later entrants.

Relations between business and the rest of society shifted over time. In his provocative essay, Donald Horne (1985) asks: who rules Australia? His answer (pp. 191–2) is that business interests, broadly defined, prevail. The same question posed in 1900 would have drawn a different response, possibly in terms of class, the ‘bosses’, or the ‘people’, or a narrower group of business interests, probably financiers or pastoralists. Horne’s argument speaks volumes about the growth in the importance of business as a multifaceted institution in Australian society over the past century. However, more work is required to explore the relationship between business and society, how business wields its influence and to what ends. The literature reviewed in this chapter has shed light on an important phenomenon. In many respects, the results are preliminary as the field of business history is relatively new. Future research, drawing on a wider set of theoretical and conceptual frameworks, would generate high returns.

Government and the evolution of public policy

JOHN K. WILSON

Introduction

There are perhaps few periods in Australian history that rival the first half of the 20th century in terms of the magnitude and frequency of exogenous shocks in the world economy and political structure. Two world wars, a deep worldwide economic depression and a global flu pandemic are prime examples. All of these took place within the first 40 years of the adoption of the Federation of Australia, itself a major political change with significant effects on public policy throughout the 20th century.

This chapter examines some of the major aspects of public policy in Australia between the late 19th century and the immediate years following World War 2. Such an analysis is ambitious. There were an array of different policy interventions at different levels of government, and no one chapter is able to cover in detail the many specific policies that were adopted, nor the detailed negotiations that may have occurred at federal and state levels over each. The focus here is on major policy decisions relating to international trade, labour, immigration, competition, rural production and management of the economy during wartime.

There is a strong interrelationship between many of these policy decisions. What does seem to be a salient feature of government during the period, again at all levels, is its commitment to aiding economic and social development. This underlies most policies, but over time there was a change in the manner by which government intervened to achieve development. In particular, government passed through a period of 'colonial socialism' in the pre-Federation period during which it acted as a partner in achieving economic development and engaged in more direct restrictions in market outcomes in many sectors of the economy. Moreover, these interventions were increasingly centralised, with a growing role for the federal government as the 20th century progressed. This was not so much a structural change at a specific

moment (though 'key' events such as war hastened change), but one that occurred gradually over time.

Pre-Federation

During the second half of the 19th century, Australia yielded vast wealth from natural resources. There were large discoveries of minerals, most notably those of alluvial gold in Victoria from 1851 onwards, but also copper in South Australia and gold in other colonies, in particular Western Australia towards the end of the century (Greasley, this volume). There was a relative abundance of land suitable for grazing and cropping and Australia was one of the largest global exporters of wool. As an example of the sector's importance, during 1871–90 the proportion of Australian exports taken up by wool averaged 85 per cent (Butlin 1971, p. 30 and the author's calculations). Against this backdrop, the population grew at an extremely fast rate, from 400 000 in 1851 to 3.2 million in 1891 (Boehm 1971a). Population was concentrated in Victoria and New South Wales (approximately 70 per cent). Indeed, during the first 10 years of the Victorian gold rush, the colony's population grew from 77 000 to 540 000 (Caldwell 1987, p. 26; Seltzer, this volume). In the period prior to the 1890s depression, Australia experienced rapid rates of growth and had living standards among the highest in the world (Madsen, Shanahan, this volume).

Against this backdrop of rapid development, government became an active player in the economy. The period from about 1860 to Federation has been characterised as one of 'colonial socialism' (Butlin 1971). In essence, government sought to shape and actively take part in the economic development of colonies. This took the form of public action to attract capital and labour, direct ownership of resources and, importantly, production undertaken by the public sector. While people were attracted to Australia by economic conditions, governments directly embarked on a series of policies to generate further immigration, most notably direct subsidisation of travel and settlement costs. Increasing population was seen as key to economic development, but alongside this was the need for infrastructure to facilitate population-led growth. The colonial governments embraced this role, and became almost sole providers of communication, water and sewerage, and transport services. Despite their natural monopoly characteristics, most other countries at this time had relied on provision by private enterprise, making the Australian case somewhat unique (Ergas and Pincus, this volume). The scale of public production was large and by the end of the century government accounted

for 5 per cent of employment and 6 per cent of GDP (Butlin, Barnard & Pincus 1982, p. 17). Public-sector borrowing, generally through issues of securities in Britain, was also significant. Public share of GDP formation rose from 38 per cent in 1880 to 61 per cent in 1900 (Butlin 1987, p. 137 and the author's calculations). To a large extent, private interests relied on this government involvement, particularly with regard to immigration and capital raising, and in that sense there was some complementarity between the public and private sectors.

There were differences in strategies between the colonies, most starkly in the trade policies of New South Wales and Victoria. The former essentially adopted free trade, most likely due to higher revenue flows from land. Victoria, however, pursued a particularly protective stance, and in 1880 the average manufacturing tariff in Victoria on dutiable goods was around 18 per cent. This was in part revenue-driven; however, it is likely that the process was at least partially captured by special interests during the 1870s and 1880s (Wilson & Shanahan 2012). A further explanation is that there was a genuine fear Victoria would lose population at the end of the gold rush period, and so establishing an industrial base would help offset or reverse this.

Counterfactuals are difficult to establish, but the population of Victoria continued to grow up to Federation. However, in comparison with New South Wales, the rate of population growth over the period was lower (approximately 18.5 per cent in 1871–1900, compared with 40 per cent for New South Wales), and at Federation New South Wales boasted a larger population (Caldwell 1987, p. 26). It may well be that without tariffs, Victoria would have experienced lower population growth, or even a decline. Nonetheless, the welfare effects of protection for the colony were likely to have been negative relative to a free trade position (Siriwardana 1985; Bossy 1964).

The last 10 years of the 19th century saw a reversal of fortune for the Australian economy. There was a general world depression. The 1890s saw a large outflow of private capital from Australia, which to some extent raised pressure on government borrowing. Australia's pre-existing debt levels and sectors reliant on strong commodity prices made the country extremely vulnerable to the depression, and it failed to recover as quickly as other nations, including its neighbour New Zealand. Notwithstanding this delayed recovery, Australia had inherited political and institutional pillars that would enable later recovery and prevent disruptive social upheaval – though political adjustments did take place, most notably the development of labour unions and the formation of the Australian Labour Party (as the Labor Party was then known).

Early years of Federation: 1901–14

The new Federation established specific powers for the Commonwealth (or federal) government, set out under section 51 of the *Commonwealth of Australia Constitution Act 1900*, with what might be termed 'residual' policy to be applied by the states (Sawer 1956). Importantly, the federal government acquired control over customs and excise, with the condition that tariffs should be imposed uniformly across states, and that interstate trade be free of duties (Western Australia received a five-year exemption from this condition). This ended the potentially damaging economic distortions that had existed previously between states. The federal government also had control over immigration policy, some public services (most notably the postal service), currency issue and banking, and defence (individual states were precluded from raising an army). Importantly, there was no *direct* power for the Commonwealth over labour relations. However, it did hold power to intervene in industrial disputes where the effects of the disputes were not to be contained within one state.

Customs and excise duties were to become almost the federal government's sole revenue source for the first 10 years of Federation, and a major source in the years leading to World War 2. They were the subject of intense debate in the parliament. However, section 92 of the Constitution ensured that there would be free trade between the states. The first election yielded a House of Representatives that consisted of 32 protectionist, 27 free trade and 16 Labour Party members. The latter party was ambiguous in its attitude to protection, with five members declaring themselves 'protectionists' and six 'free trade'. This resulted in 37 votes in favour of protection, 33 free trade and five uncommitted Labour Party members holding the balance. This arguably gave the protectionists a tenuous majority (Sawer 1956, p. 18). The distribution of election results between states, however, was quite different, with a majority of free-trade seats being won in New South Wales, South Australia (which as a colony had previously adopted a relatively high level of protection), Western Australia and Tasmania. Indeed, it was only the strength of the protectionist victory in Victoria that saw the composition of the House of Representatives eventuate as above. However, as a direct result of the state results, the 'free traders' held a Senate majority.

The first tariff, which arose from vigorous debate between these opposing views, has largely been viewed as a compromise, which was forced as a result of the Senate majority of those representing free trade and the divisions in Labour. It was not, however, a compromise centred on economic factors.

Sawer (1956, p. 24) notes 'the ultimate result was described by disappointed protectionists as free trade, and by moderate protectionists as neither free trade nor protection'.

Despite this view, average tariff levels for the country appeared to rise, caused by an increase in tariff schedules and by import price deflation (McLean 2013; Irwin 2006). Moreover, domestic producers still enjoyed natural protection from sea transport costs (Anderson 1995). In retrospect, this may have been a major win for protectionists as subsequent rounds of tariff negotiation generally delivered increases. In 1908 the Lyne tariff raised many tariff rates, which had significant protective effects on Australia's trade patterns (Irwin 2006). Such a result was unsurprising. Thirty years of high protection in colonial Victoria had entrenched vested interests, which were politically organised relative to other sectors such as agriculture. Moreover, the economy had not fully recovered from the 1890s depression and the agricultural sector in particular had been hard hit. Policymakers saw the future path to prosperity through industrial development of the cities, but even more importantly they saw potential political gain from the support of urban-based industry. This political victory for protectionists was also assisted by the arrangement that for the first decade of Federation, the states would receive 75 per cent of tariff revenues (Sawer 1956, p. 16).

A second major aspect of policy for the new federal government, and one related to trade policy in terms of intention, was that of immigration. There was a continuing emphasis on increasing the population. Australia began as a labour-scarce country and hence the focus from the time of settlement was to increase population. Indeed, after Federation, each of the state governments maintained their competitiveness over immigrants by retaining their own immigration offices in Britain.

Governments at all levels saw increasing the number of migrants as a means by which prosperity could be encouraged, and there was a relatively close relationship between rural and non-rural expansion. Immigration was subsidised at the Commonwealth and state levels. How much of a factor this was is debatable. Pope (1987, p. 44) suggests that potential migrants were sensitive to the price of travel; however, Pincus (1987) notes that only half of those arriving in 1908 received subsidies. Clearly, there were factors that attracted migrants other than subsidies, but there is no doubt that government incentives played a role.

The early years of Federation saw the beginnings of a more formal 'White Australia' policy. There had been some dispute as to how exclusion of non-whites should be practised, in particular the distinction between 'soft

filtering' by way of language tests or more direct methods (Sawer 1956). Early legislation set out in the *Pacific Island Labourers Act 1901*, which precluded the use of Melanesians, was subsequently reinforced by policies that encouraged the use of white labour, through the ability to avoid excise taxes (*Excise Tariff Act 1902*) or gain subsidies (*Sugar Bounty Act 1903*). Even legislation related to employment of contractors in the postal service mandated the use of white labour (Seltzer, this volume).

Rural policy, through a variety of measures at state level, sought both to expand and encourage diversification of rural activity. The latter manifested itself in a variety of regulations that restricted the availability of large land-holdings and imposed different tenure conditions. At the same time, assistance by way of subsidised loans for the development of properties and the purchase of capital were offered, predominantly to 'non-wool' farming (Butlin, Barnard & Pincus 1982). To a large degree, the result was a government-supported change in the structure of the agricultural sector, away from wool towards a broader range of outputs, particularly wheat and meat production. In part, this was caused by changing prices for rural products and in this context diversification may have occurred regardless. However, government involvement facilitated and to a large extent controlled the pattern of this transformation.

There was an overall theme of government intervention with the purpose of creating the conditions under which economic development could occur. However, the government began to retract from the 19th-century position of being a 'complement to the private sector' and instead started to have more influence over the rules under which the private agents operated. In essence, it moved, albeit not completely, from being a direct participant to serving a more facilitative role. Beyond direct assistance, targeted immigration generated, and possibly required, a range of other policies that drastically altered market outcomes.¹ The case of tariff protection has already been noted. It was largely believed that developing the manufacturing sector would provide employment capable of attracting people from abroad – particularly to Melbourne and Sydney. This in turn would obviously require relatively attractive wages. However, wage growth had been very low during the 1890s

1 Policy was largely targeted towards white immigration from the United Kingdom. The subsidies for travel were rarely offered to those outside the United Kingdom (though this subsequently was dramatically altered in the 1950s towards attracting those from Italy and Greece in particular). The British government also later provided a 'push' element by direct subsidisation and other policies which developed land settlement in Australia. For a more detailed discussion, see Pope (1981, 1987).

and minimum nominal wages remained at their 1891 level in 1901 (Withers, Endres & Perry 1987; Hatton and Withers, this volume).

Constitutional constraints limited the federal government from intervening other than in cases where disputes extended ‘beyond the limits of one state’.² In 1904 the Commonwealth Court of Conciliation and Arbitration was established for this purpose. However, wages were also linked to tariff protection in 1906 as part of what was called ‘new protection’. Here, an explicit clause was inserted such that manufacturers would be subject to an excise tax of approximately half of the import duty unless they paid ‘a fair and reasonable’ wage. An initial determination of 7 shillings per day was set down in the much cited Harvester Case (see Hatton and Withers, this volume), and despite the fact that the legislation behind this was subsequently overturned by the High Court, this figure remained as a benchmark for future wage negotiations. This led to reduced labour market competition and in turn generated a platform for further wage claims (Butlin, Barnard & Pincus 1982).

Had the manufacturing sector been more competitive, a larger share of the gains accruing from tariff protection would have been passed to workers. However, as noted by Pincus (1995), protection had played a part in encouraging monopoly. The major rival parties of the time saw monopoly as essential in facilitating the development of industry and increasing efficiency (Sawer 1956, p. 46). The only dispute was about how to control abuses of market power that were acknowledged but downplayed. Free-trade advocates believed exposure to international competition was key while the Labour Party advocated nationalisation of monopolies. Protectionists were ironically the group that held the greatest concern about monopoly power but from the perspective that monopolies were less likely to pass on wage benefits to employees. The protectionists were substantially placated in this regard by ‘new protection’, which, as noted above, had attempted to allow the federal government a back-door route to jurisdiction over wage control.

In part to address possible abuses by monopolies and cartels, the government introduced the *Australian Industries Preservation Act 1906*. However, a more central objective was to prevent entry into domestic markets by American trusts (Round & Shanahan 2012). Colonial socialism in Australia had been characterised by the development of large government monopolies, which had to a large extent been successful in fostering development, or at least seen to be doing so. This contrasted with private provision in other

2 Unsuccessful attempts were made to amend this section of the Constitution by referendums in 1911, 1913, 1926, 1944 and 1973.

countries, particularly the United States. Hence, while constraint of abuse of private monopolists was the key motivation for antitrust legislation in the United States (the Sherman Act), this was not the same in Australia. In a real sense, anti-competition law in Australia was more an extension of protection than an attempt to prevent monopoly power.

A test of the Australian Act was provided by the so-called *Coal Vend Case*. The case involved alleged cartel behaviour by a group of Newcastle coal-mine owners (Associated Northern Collieries) and subsequent agreements over price, output share and even rules surrounding the opening of new mines among rival firms. These agreements emanated directly from increasing competition (particularly the Maitland Mines). Initially, the courts found against the cartel behaviour but this was overturned by the High Court in 1912. The judgment of the High Court fully acknowledged the existence of the cartel and the associated restrictive practices. Key, however, was the notion of whether a restraint of trade was to the detriment of the public. The Court seems to have fully embraced the notion of 'ruinous competition' (Pincus 2009). The acceptance of the 'inevitability' and indeed the beneficial nature of monopoly, already acknowledged by much of the parliament, and suspicion of competition are both plainly exposed in the judgment:

It may be that the detriment, if it be one, of enhanced price to the consumer, is compensated for by other advantage to other members of the community, which may indeed, include the establishment or continuance of an industry which otherwise could not be established or would come to an end'.³

In our opinion it was ... a lawful and even laudable transaction which was intended to operate and did operate to the advantage and not to the detriment of the public at large ... notwithstanding that it was intended and did operate to raise the price of coal.⁴

More explicitly, the High Court stated:

Cut throat competition is not now regarded by a large portion of mankind as necessarily beneficial to the public.⁵

On appeal to the Privy Council, this was upheld, effectively rendering Australian antitrust legislation ineffective. Moreover, the reasons underlying this decision could only be interpreted as a direct support for monopoly by the Australian courts, which surely acted as a signal to other sectors.

³ *Adelaide Steamship Company v The King and A-G* 15 CLR 77.

⁴ *Adelaide Steamship Company v The King and A-G* 15 CLR 91.

⁵ *Adelaide Steamship Company v The King and A-G* 15 CLR 76. Also cited in Pincus (2009).

These judgments were instructive as to the way both governments and institutions in Australia operated. Perhaps due to a long history of government monopolies prior to 1900, competition was not considered a reliable means by which to achieve prosperity. Markets were unpredictable and government was required to steer the economy. Through early arbitration and the setting of the minimum wage, the labour market was set for future regulatory constraints to be imposed. The failure of antitrust law combined with tariff protection saw monopoly being encouraged. The formation of special-interest groups would have been assisted by both of these factors, and very likely this set the Australian economy on the path of even greater intervention.

World War I and the interwar years, 1914–39

The outbreak of World War I in mid-1914 had significant negative consequences for Australia. In support of the war effort, 416 000 soldiers enlisted (McKernan 1987, p. 412). In terms of the closest available population data (from the 1911 Census), this represented about 18 per cent of the male population. Casualties from combat numbered 213 000, with just over one-quarter of those losing their lives. Many others developed illness while overseas, which was to limit their ability to work on return.

The financial cost of the war effort was also considerable – more than £180 million during 1915–18 (Barnard 1987, p. 258). Revenue from customs duties and other sources were fairly robust (despite shipping restrictions), and the federal government increased and introduced a series of taxes. Land tax was increased in 1914 in terms of rate and scope. Income taxation at a federal level was introduced in 1915 and subsequently rates were increased in 1916 and 1918. However, despite these sources, the crippling war outlays and continuation of domestic spending could only be covered through extensive borrowing, both through public issue and overseas borrowing. While Australia had at the time a long-standing tradition of rising public debt (Barnard 1987, p. 256), total public debt increased by £353 million or 117 per cent during 1914–18. This compared with a rise of only 15 per cent in the three years preceding 1914. At the end of the war, total public debt sat at 123 per cent of GDP.

GDP per capita fell by around 10 per cent between 1914 and 1918.⁶ The end of the war was then immediately followed by an influenza pandemic in 1919

⁶ See McLean (2013, p. 145) who presents series by Haig (2001) and McLean and Pincus (1982). The latter have been used here. Notably, real GDP/capita data reveal both

that killed 14500 across the country, many of whom were of working age (Niall, Johnson & Mueller 2002, p. 114) and Australian GDP per capita did not begin to rise until 1920, regaining 1914 levels in 1923–24.

Protection from overseas competition in Australia and restrictions in shipping either helped existing industries to expand or led to the development of new manufacturing (Butlin, Barnard & Pincus 1982, p. 76). This helped offset contraction caused by an exodus of manufacturing workers to the armed forces. Data compiled by Snooks (1987) reveal that manufacturing employment fell between 1914 and 1918 by 64700 workers (a 20.1 per cent decline from 1914) but returned to prewar levels immediately in 1919. However, both investment in the sector and output grew in the second half of the war. This might indicate increasing use of capital generated by labour shortages.

The war had given manufacturing somewhat of a boost, despite labour market conditions. Industries that had benefited would have much to lose from the reinstatement of prewar competition, should it have occurred. Moreover, there was an obvious need to employ returning servicemen. The *War Precautions Act 1914* had yielded extensive powers through the Governor-General for control over the economy to be set with the central government. The powers, which included among other things an unencumbered right to borrow, allowed the government to procure goods at fixed prices. Interventions ranged from government subsidisation of exports (*Freight Arrangements Act 1915*) to the purchase of agricultural commodities (*Sugar Purchase Act 1915*) (Pincus 1995; Sawyer 1956).

The challenges faced by governments at the end of the war were numerous. There was pressure to protect industries that had benefited from the war and reinstate those that had suffered. Some of these new industries included steel manufactures and motor-body building, and hence calls for protection were also backed to some degree with the link to national defence. A strategic need to populate northern Australia was provided as justification for continued price support for sugar producers (Griggs 2011, p. 774). There was the strong desire to return to the prosperity achieved just before the war, and again, targeted immigration was seen as key to this. This also required the orderly dismantling of the raft of price and output distortions that the war had necessitated. The returning army of servicemen would also need to be again integrated into the economy. These goals were sometimes in conflict. The return to prewar trade would have an adverse impact on newly

a decline in GDP but also an increase in the denominator as there was continued immigration during the war years.

formed manufacturing, for example. Various sectors were likely to have been more politically organised than at other times. Hence, the governments of Australia found themselves in the position of needing to facilitate recovery in the postwar era, following a period of major interventions in the market.

In 1921 the 'Greene Tariff' was introduced. Average levels of duties payable would double from the 1908 Lyne tariff and the range of dutiable imports increased to around 70 per cent (Kenwood 1995; Lloyd 2008). The legislation also established the Tariff Board, which enabled industry to request revisions over rates applied to their goods. In one sense, the government may have been attempting to detach itself from the politics of setting trade policy. While the Tariff Board had no actual power to set rates and merely made recommendations based on industry submissions, most were accepted by government. Perhaps far more significant is that the Board acted as a conduit by which special interests could lobby their case and most likely exacerbated rent-seeking distortions. The transactions costs associated with raising a claim would have been more easily overcome where interests were politically organised. Indeed, in an empirical paper examining the extent of lobbying in Australia, McCalman (2004) used the ability to make representations to the Tariff Board as a proxy for an industry being politically organised. Hall (1958) identified that between 1924 and 1930, 180 cases were brought before the Board. One hundred of these resulted in a recommendation of an increase, 61 to keep the tariff unchanged and only 19 to reduce it. Part of this imbalance is explained by the number of these reviews that were justified on the grounds of increasing costs – often generated from increases to labour costs attributable to wage-board rulings. Higher tariffs were in turn used as an argument for higher wage claims. Hence, in this fashion, wages and trade policies fell into a vicious circle (Pincus 2009).

Assistance was not confined to the manufacturing sector. Agricultural markets were unstable following the end of World War 1. Many countries responded to shipping restrictions by developing greater self-sufficiency in agriculture. Stockpiles were accumulated worldwide, which had the effect of lowering commodity prices after the war as price fixing was eased. This had negative effects for Australian rural exports, particularly wool, for which the international price fell almost continuously after 1925 (Schedvin 1970, p. 29). A key underpinning of assistance began through immigration policy set jointly with the United Kingdom. Excess labour from Britain was sent to Australia. Underlying the process was the idea that associated increases in primary production could be traded back to the United Kingdom (Schedvin 1970). Australian authorities embraced this logic and indeed believed the

scope of development that could be achieved through agricultural development was almost boundless. Nonetheless, the majority of overseas arrivals were destined for the urban centres of Sydney and Melbourne (Pope 1981).

A variety of state-based schemes to assist agriculture had met with limited or at least diminishing success (Butlin, Barnard & Pincus 1982) and were ultimately replaced by federal schemes. Merrett and Ville (2011, p. 51) report estimates of the level of assistance from direct subsidisation in 1926–27 of up to £22 million. An estimate of the subsidy equivalent of the tariff for the same period was only slightly higher at £26 million. Policies were also formulated at streamlining the process by which produce was sold, predominantly by the establishment of marketing cooperatives and various policies that instilled the right to operate in an anti-competitive manner. For example, growers associations were formed to facilitate pooling of output. The extent to which these cooperatives abused their power is somewhat unclear. There is an obvious possibility that transaction costs may have been reduced and Merrett and Ville (2012) argue that the Melbourne Woolbrokers' Association was not responsible for price 'gouging'. Butlin, Barnard and Pincus (1982, p. 85), however, suggest that consumer interests were rarely recognised in the behaviour of such cooperatives.

As in the period before World War I, the economy was characterised by high levels of government intervention, which were aimed at facilitating a certain path of development rather than adopting state control of enterprises. One major change was that rural assistance had become more centralised. Despite a variety of policies aimed at expansion, rural output fell relative to manufacturing in the period up to 1929. Merrett and Ville (2011) argue that structural changes outside policy were the more direct causes, and that the nature of economic growth over the period changed, in particular the rise of domestic consumer industries. It was apparent that policy could only partially insulate the rural sector against market conditions. The 1920s also saw a sharp decline in private investment in the rural sector. Agriculture was entering a 'mature' phase, with major infrastructure such as fencing having been largely adopted in the previous decade (Schedvin 1970, p. 67).

Prior to the Wall Street crash of 1929, the Australian economy was already facing several difficulties. Some were direct results of previous public policy interventions. First, the ever increasing wage–tariff spiral was impacting on producers in Australia. Wages were a major production cost and many capital goods were imported. During the 1920s, world production costs were on the other hand falling, including those in Britain, which was a major trading partner. Hence, both import-competing firms and exporters were facing difficult

times and, ultimately, the system appeared to be destined to fail without a major intervention.

Urban growth underpinned by immigration policy had also led to strong demand for publicly provided services such as sewerage and public transport for growing cities. Only a portion of this could be considered as 'productive' investment, and indeed the ratio of social to productive investment rose in the second half of the decade by more than 30 per cent (Schedvin 1970, p. 71). A major problem was how to fund these works. Government at the time was reluctant to impose new taxation or increase existing taxes and hence most funds were raised offshore, particularly from Britain. The ratio of loan servicing to exports stood at around 28 per cent in 1927–28 – a function of increasing debt *and* falling export earnings (Wilson 1931).

Agriculture was struggling not just due to issues of competitiveness in terms of production costs, but also due to falling world prices for output. Australian production had expanded in response to the large reductions in European output during and after the war. While European output was slow to recover, it had done so by 1925 and the result was a falling world price for many agricultural commodities (Schedvin 1970, p. 27). At the same time, immigration policy also acted to exacerbate structural issues in the sector. The push to relocate British migrants to the land – for example, through the '£34 million agreement' – took the form of public-sector involvement in subsidising passage, land acquisition, credit and irrigation with a view to increasing the number and diversity of farming activities, often at the expense of scale. Crops that had previously remained limited, such as wine and fruit, were actively encouraged. Unfortunately, this planned agricultural economy was largely unsuccessful. Both British immigrants and Australian ex-soldiers were settled on the land, and many of these had little if any rural experience and they were often settled on allotments that were too small or infertile. Hence, it would not have been easy for them to respond to many of the challenges discussed above. Further, it appeared that crops that moved in the opposite direction, towards larger-scale production through the adoption of new technologies, were more successful. This had been achieved in wheat and wool, and government had played a role in providing information and credit for these technologies (Schedvin 1970, p. 65).

These aspects, in particular rising debt, did not go unnoticed in the world economy. In 1929, British lenders adopted a more stringent view of the Australian capacity to service debt, and towards the end of the year new credit effectively stopped. This was well in advance of credit constraints on other countries, such as New Zealand. In part, this could have been a function of

the large portion of British lending to Australia (around 40 per cent of total British lending), but also was due to genuine concerns about the nature of spending, particularly by government, and falling export earnings (Schedvin 1970, p. 100). At this time, export earnings and the balance of trade were falling quite dramatically and gold reserves were exchanged for British currency in order to service government debt. So desperate did the situation become that in late 1930 the central bank (the Commonwealth Bank) was granted legal power to purchase all gold, leaving only fixed amounts held in reserves by banks and a small discretionary quantity aimed at maintaining the appearance of adhering to the gold standard.

Whether the depression (referred to over time as the Great Depression) was worsened by these internal aspects has been debated. For example, Valentine (1987b) suggests that had export incomes experienced growth at the same levels as in the 1920s, then the depression would have been largely averted. This suggests that the depression was a mere 'import' to the Australian economy. On the other hand, the concern raised in British capital markets prior to that of other countries and the uncompetitive nature of Australian industry and labour point to issues that would have raised their heads eventually. It seems that these would have exacerbated the effects of what had occurred globally. Indeed, in a country with many market rigidities, it would not have been unexpected that the depression hit fairly hard. For example, wages were slow to adjust. Initially, the Commonwealth government attempted to achieve wage restraint by passing down responsibility for wage arbitration to the states. This was mostly driven by a desire to ease industrial unrest, which was viewed as a cause of the economic downturn that had occurred since 1927 rather than a symptom. Ultimately, it took until 1932 for real wages to fall.

The government response to the depression was initially muted. As the effects became evident in late 1929, a new government had just been elected. The large majority held by the Labor government was substantially blocked by the Senate where the majority was held largely by anti-Labor Country Party and Nationalist members. Hence, many of the policies that were passed were actually those 'designed by [the Labor Party's] opponents, and anathema to most of its followers' (Sawer 1963, p. 10). Defence expenditure was initially cut, and in 1930, partially to ease trade balance deficits and partially to raise revenue for British debt servicing, tariffs were increased. Income taxes were also raised for this latter purpose. Schedvin (1970) notes that it was fortunate that most government spending cuts were slow to take place since this would have had a counter-cyclical effect initially.

Further government responses to the depression came on four fronts. Real wages, as noted, were ultimately reduced by 10 per cent in 1931. Tariffs were used as a device to limit imports and raise revenue, though this was harmful to agricultural interests, particularly in Western Australia. This combined with other constitutional issues perceived to adversely affect the state culminated in the successful 1933 state referendum to secede from the Commonwealth (Musgrave 2003). The matter was referred to the British government, which argued that the preferences of Western Australia could not overrule the indissoluble nature of the Australian Constitution, and by the time these deliberations had taken place, much of the political will for the change had been lost.

The Australian currency was devalued in an attempt to raise the level of exports. Finally, the 'Premier's Plan' was adopted. This contained some rather contradictory measures, such as reducing government expenditure and increasing taxation while also lowering interest rates. How effective the plan was has been debated; however, it is likely that at best the policies worked against each other, and that the abandonment of the gold standard and subsequent devaluation, coupled with wage reductions, were more likely to have assisted (see Valentine 1987; Butlin, Barnard & Pincus 1982).

There were also substantial international developments in response to the crisis that had an impact on Australia. In European markets, the depression marked the end of relatively abundant lending by the United States. There were associated pressures on the gold standard as capital outflows greatly threatened gold reserves in the United Kingdom. Ultimately, the system fell and a new set of currency arrangements took the place of the gold standard. A large group of countries, including Australia, attempted to achieve monetary stability by entering into the Sterling Bloc, in which currencies were pegged to British the pound.

There were attempts at political management of trade through multilateral trade agreements. In the case of Australia, the Ottawa Conference of 1932 was seen initially as a threat to previous increases in tariffs undertaken by the Scullin government in 1929. However, there was also some belief that trade within the British Empire could help countries recover from economic downturn. In general, the Conference led to an agreement of positive trade discrimination towards Commonwealth countries (Pincus 1995). For Australia, there would be free entry of primary exports into British markets and indeed a series of trade barriers levied against some competing exports, notably Latin American meat (Attard 1998). The United Kingdom in return received a return to preferential tariffs that had been eroded during the 1920s.

Interestingly, Britain secured a clause designed to have its industries ranked as 'domestic competitors', which was later effectively overturned by the Tariff Board (Attard 1998). The effect of both the currency bloc and the preferential trade agreements has generally been argued as increasing trade between Australia and Britain over the period. However, Eichengreen and Irwin (1995) argue that while the Ottawa Agreement increased intra-Commonwealth trade between 1928 and 1935, the agreement was more augmenting existing trends rather than initiating trade. At the same time they fail to find any significant effect on the trade of the Sterling Bloc.

World War 2 and the postwar period

The economic recovery was incomplete when, in 1939, Australia again found itself at war. This was not to be a 'distant war', as had been the previous Australian experience. Within three months of the bombing of Pearl Harbor in December 1941, Japanese occupation stretched across much of the Asia-Pacific region and towards Australia's northern borders. Singapore, the Philippines, British Malaya, the Dutch East Indies and northern New Guinea were all under Japanese control. Bombing raids were launched on Darwin and other targets in Australia's north. For the first time, Australians were faced with an imminent, likely threat of invasion. Moreover, the country was to a large degree alone; American and British forces were not in a position to assist in the defence of Australia to any large degree.

During the war, enlistment in the military had an obvious effect on labour markets, particularly after 1941. From the commencement of the war in Europe in September 1939 through to November 1941, 368 000 Australians had enlisted. This was to rise in the following year to 656 000. Peak enlistment occurred during 1943 when 732 000 people were members of the armed forces (McKernan 1987, p. 414). Government policy was centred around the diversion of resources towards military production and preparation for possible attack. There was a sense of extreme emergency and some pessimism, but not a sense of panic (Butlin & Schedvin 1977). In a propaganda leaflet, the Prime Minister stated:

The enemy thunders at our very gates. Everything we cherish is in immediate peril. As Australia's leader I can no longer wait to argue with you, appeal to you or reason with you. There is no time: the danger is too great. Strikes, lockouts, provocation, profiteering and exploitation increase our national danger. They must cease. What we have done, or are doing, is not as good as we can do – should do – and must do. You must make a complete sacrifice

for Australia or become a complete sacrifice to the enemy. It's fight, work – or perish.⁷

What was essentially asked of the public was to unquestioningly follow the needs of the country as determined by the government's war plan, and to realise the urgency of the situation. Given the possible costs, this was not unreasonable, and the language itself reveals that the feeling was one of 'even our best may be insufficient'.

Butlin and Schedvin (1977) provide a comprehensive overview of the actions taken under the federal government's plan. There was a mobilisation that generated expansion in the number of military personnel, which is highlighted by the expansion in numbers discussed above. This was effected with great speed. Associated with such a large expansion of military personnel was of course the need to provide goods and services that would support them. Hence, a second part of the plan was focused around gaining control over the production and distribution of various goods and services required by the forces. Complementing this was a program of construction – for airfields, training facilities, and accommodation.

There were also shortages in terms of production required to support the civilian population. The government developed several policies to divert resources to areas seen as vital (military and non-military) and formed 'the Manpower Directorate' to examine various alternative uses of labour. Certain types of goods and activities were forbidden – for example, those which involved the non-essential use of fuel. Ultimately, despite best efforts at managing shortages, rationing was a final option that was employed.

The direct expenditures by government on defence were large and financed largely through income taxation and the issuing of government debt. Table 15.1 reveals that during 1942–43, defence spending comprised 34 per cent of GDP and more than 70 per cent of Commonwealth spending, a figure that represents a maximum in Australia's history.

The adoption of a highly planned economy enabled a swift response to the situation at hand. However, as the war progressed into 1943 and beyond, it became apparent that the Japanese threat had eased and indeed victory was inevitable. This was not before much power over public policy had been centralised towards the federal government. Some of this centralisation, intended as part of the war effort, persisted into the postwar years. For example, the Uniform Tax Agreement of 1942 effectively shifted control of income and company taxation from the states to the federal government

7 'It's Fight, Work or Perish!', Australian War Memorial Library, RC02370.

Table 15.1 Defence expenditure, 1939–47

Year	Amount (\$ m current prices)	Percentage of GDP	Percentage of Commonwealth outlays
1939–40	108.7	5.3	33.0
1940–41	319.0	14.7	61.7
1941–42	596.8	23.4	70.6
1942–43	998.8	34.0	71.6
1943–44	886.1	29.7	61.6
1944–45	704.7	24.2	54.8
1945–46	644.3	21.4	58.5
1946–47	243.2	7.5	25.3

Source: Derived from ABS (2001, Table 4.4).

and replaced the state revenue streams with a series of grants – a system that has essentially remained to the current day. Despite the obvious revenue needs of the Commonwealth during the war, there were other possible motives – for example, eliminating differential income tax rates imposed by the states and imposing demand constraints on private agents away from non-war essential spending (Maddock 1987). The Acts underlying this agreement were opposed by most states and were the subject of two unsuccessful High Court appeals in 1942 and 1957.⁸ Similarly, price and rent controls of necessity imposed during the war were retained in the postwar years.

All in all, during 1944–48 the Commonwealth made several attempts to change the Constitution. These included the referendum of 1944 in which the federal government sought to garner control of 14 powers for a period of five years after the war, including powers over employment, production and distribution, national health and monopolies. The vote was debated fiercely, with the Minister for Information at one point claiming that the ‘Japanese were hoping for a “no” vote’. Arthur Fadden, the leader of the Country Party, claimed in opposition that the powers amounted to ‘industrial conscription’.⁹ The government put this to the electorate as a single question, despite the large number of powers covered, and the changes were rejected by all states

8 The agreement did not preclude states levying taxes, but it was initially argued by the states that the rate of tax imposed at a federal level effectively precluded double taxation. The agreement was unsuccessfully challenged by South Australia, Victoria, Western Australia and Queensland. In relation to the first two states, see *South Australia v Commonwealth* (1942) 65 CLR 373 and *Victoria v Commonwealth* (1957) 99 CLR 575.

9 See the articles ‘Japanese’ and ‘Country Party’s No Campaign: Mr Fadden Attacks Labour’s Referendum Plan’, *Sydney Morning Herald*, 25 July 1944, p. 4.

except South Australia and Western Australia. Further constitutional reforms aimed at centralising social services, government control of marketing primary output, price and rent controls, and industrial employment controls were also sought, with only the first of these carried.

What these referendums reveal is that the nature of governance had changed in Australia. There was a firm belief held by the federal government that the market could not deal with the challenges of a postwar economy. There was an armed force of more than 700 000 people to absorb into the labour force. Private-capital formation had waned, with barely a recovery from the end of the recession through to the end of World War 2 (Maddock 1987). Moreover, the economic management undertaken at a federal level had been a success. Hence, there was increasing acceptance of the notion that (centralised) government would be the vessel by which the peacetime economy would be successful. Full employment was the top goal, and government planning at all levels was the manner by which it would be achieved. Government intervened widely, through demand management, wages policy, public-sector expansion and regulation, tariff protection and the development of key industries. This latter category involved government identifying sectors that could capitalise on the munitions and aircraft manufacturing developed during war.

There appears to have been a sense of haste and at times myopia in the fervour to achieve such development. For example, Butlin and Schedvin (1977) detail the manner by which automotive construction was brought to Australia at the end of the war. At the time, there seemed to be much haste among policymakers to make this happen, to the extent that the government accepted the first tender it received (from General Motors–Holden); the tender included a condition that effectively required that concessions offered to a prospective manufacturer in the future would also be offered to Holden. This was later to cause delays in the manufacture of vehicles by Ford in Australia (Butlin & Schedvin 1977, p. 761).

Conclusion

Economic development has been a focus of much government policy throughout Australia's history. In the 19th century, colonial governments were focused on attracting and retaining population. Australia was land- and mineral-abundant, but to take advantage of the natural resources available it was essential to grow the population. However, government did not limit itself to the subsidisation of labour and was active in raising capital

and developing infrastructure, and was involved in many activities that could have been undertaken in the private sector. However, this 'colonial socialism' seemed to coexist with or even complement the activities of the private sector.

The depression of the 1890s exposed some weaknesses in the Australian economy, and recovery was slow. Federation in 1901 marked a significant moment in the future governance of the country, but initially, with the exception of tariff policy, immigration and centralisation of the postal service, the federal government was not of the size and scope that it would later become. The transfer of colonial government power was far from complete, and there was still a view that states would set their economic policy agendas.

In the years prior to World War I, a pattern of trade protection and wage intervention was established. The period also seemed to reveal an attitude by all levels of government of mistrust of the private sector or, perhaps more accurately, of faith in the public sector's ability to steer the economy over that of the private sector.

This process of intervention increased after World War I. In particular, tariff protection and wage fixing became inherently entwined. Wage Boards fed from trade protection to justify wage rises and tariffs were increased to enable Australian industry to remain competitive against lower wages overseas. Governments continued to actively encourage immigration, and settlement in major cities subsequently generated pressure for infrastructure spending. The depression of the 1930s, like that of the 1980s, had a profound effect on the country and recovery was slow. Government, however, had a more active role in the recovery than had been the case at the turn of the century, and both the scope of that involvement, and its nature in terms of federal–state power relations, was about to change dramatically. World War 2 and the threat of invasion necessitated federal government intervention at nearly every economic and social level. The federal government began to take a more prominent role during the war and immediately after – it acquired the right to all income and company tax. States, now deprived of their ability to raise revenue, were reliant on a system of lump-sum transfers from the central government. This would ultimately change federal–state relations up until the present day. Perhaps what was more striking, however, was the success of wartime planning and the interventions in the postwar years. Coinciding with a global boom, the federal government must have felt assured that its model of high intervention – in labour markets, in product-marketing monopolies (particularly rural), in trade, in picking industries as 'winners' (e.g. the automotive sector) – was indeed the reason behind the current and future success of the nation.

Governments in Australia have always seen themselves at the centre of development. However, the nature of this has changed over time. In particular, the first half of the 20th century threw up a series of serious challenges to national wellbeing. The long-run response in Australia was that government became more centralised, and increasingly confident that it should be the bedrock of deciding how and what economic activity should be occurring. This was to largely set the scene for public policy until the last 20 years of the century.

The labour market

TIM HATTON AND GLENN WITHERS

Introduction

This chapter focuses on four key aspects of the development of the Australian labour market since Federation. First are the patterns in the total labour supply as influenced by population increase, participation, hours of work and trends in labour-force composition. Second is the growth in workforce skills, as represented by the changing role and place of education, including vocational training. Third is the evolution of Australia's distinctive pattern of industrial relations, including the structure of wages. Fourth are the trends and fluctuations in average wages and unemployment.

Labour supply and population

At the aggregate level, the 20th-century labour market is a story of the size and structure of the population driving the scale of the labour force available for the Australian economy. The basic drivers are those of population growth through migration and natural increase, and of workforce participation, including changes in female participation and youth and older worker engagement.

For the population base itself the 20th-century story is a mix of trend and cycle (Figure 16.1). Peace and prosperity have correlated with alternation in the population imperatives of growth and adaptation. Population growth fell to its lowest rates during the Great Depression and the two world wars. Indeed, net migration was negative during these latter periods. Peaks occurred before World War 1, before the Great Depression, after World War 2 and in the first decade of the 21st century. The Australian experience has been that prosperity encourages population expansion by attracting new immigrants, reducing emigration and encouraging higher fertility (Fitzgerald 2001). But crisis and stagnation disrupt family formation and migration choices, reducing population and workforce growth.

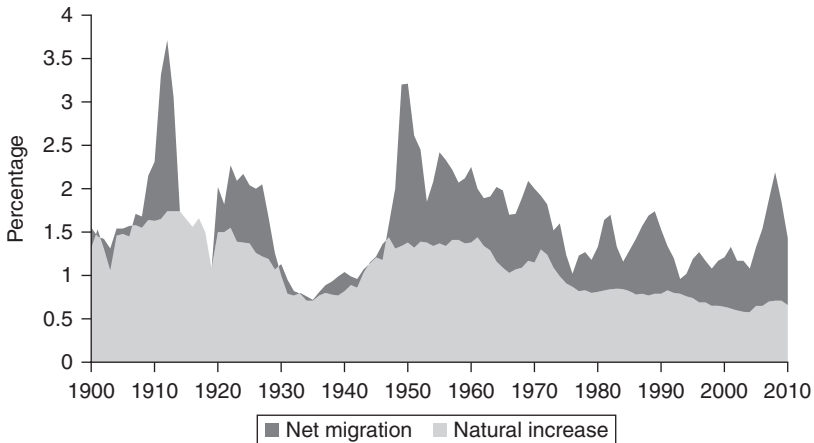


Figure 16.1 Rate of population growth, Australia, 1900–2010

Sources: CBCS, *Demography Bulletin* (various dates); ABS, cat. no. 3101.0 (various dates). Data kindly supplied by Peter McDonald of the ANU.

Nothing in the 20th century matches the massive proportionate increases in population experienced in the second half of the 19th century, nor the earlier catastrophic decline of the Indigenous population that followed European contact from the late 18th century. Figure 16.1 shows the strong contribution of both natural increase and net migration overall for the century, with migration the much more volatile factor, modifying the steady population growth created by net natural increase.

Net natural increase reflects fertility decisions made by families and the nation's mortality. With mortality, governments have sought to enhance longevity for intrinsic reasons but not for wider demographic reasons. Fertility, though, has at times been a matter that government policy has sought to directly influence, at least at the margin. The 20th century began with concern over the continued decline of fertility experienced since the 1870s and the New South Wales Government instituted a Royal Commission on the Decline of the Birth Rate in 1903. Nevertheless, the total fertility rate for Australia halved between 1901 and 1933 (Hugo 2001).

After the Great Depression and World War 2, fertility increased substantially and underpinned the so-called 'baby boom'. The year 1961 was the year of peak fertility and it was also the year that saw the contraceptive pill introduced into Australia. Fertility declined from 1961 onwards to low levels, although in the first decade of the 21st century there was a modest rise.

Table 16.1 Population by region of birth (%), 1901–2011

	Australia	UK, Eire & New Zealand	Europe	Asia	Other
1901	77.1	18.0	2.0	2.0	0.9
1911	82.3	14.0	1.6	0.8	1.3
1921	83.9	13.2	1.2	0.6	1.1
1933	86.3	11.5	1.4	0.4	0.3
1947	90.2	7.8	1.4	0.3	0.3
1961	83.1	7.6	8.0	0.8	0.5
1971	80.0	8.9	8.6	1.3	1.2
1981	78.5	8.8	7.5	2.2	3.0
1991	75.8	8.5	6.6	4.8	4.3
2001	72.6	7.7	5.5	6.1	8.1
2011	72.9	8.2	3.8	8.4	7.6

Sources: ABS (2008, 2011–12b, 2012–13).

Migration policy has been even more explicitly influenced by government policy. Emigration has not been controlled by Australian authorities, but immigration has been subject to controlled entry at the Australian border, with visas being required for all entrants (except New Zealanders) in the modern era (Castles et al. 1998). In prosperous eras immigration has been stimulated by financial assistance and deliberate promotion overseas to encourage particular immigration targets. Australians still speak of a long postwar era of ‘Ten Pound Poms’, when British migrants were encouraged to come to Australia with highly subsidised sea passage costs.

The migration contribution has, however, also been a source of change in another dimension – its countries of origin. An Australia that was ‘British to the boot heels’ in its sourcing of migrants at the time of Federation has now become one of the world’s most multicultural of nations. Australia now has 27 per cent of its population overseas-born, one of the highest ratios for a developed country. Table 16.1 shows the dominance of the British Isles in migration until World War 2. This pattern gives way after that war to both an increase in levels of immigration and a shift in its origins.

The shift in immigrant origins is partly explained by new and sustained prosperity in traditional source countries – this reduces the ‘push’ factors for those countries. Outflows increasingly come from less affluent sources and as a result of changes in restrictions in Australian policy for issuing visas, strengthening the ‘pull’ factors. Australian governments have tended to discourage immigration during less prosperous times, imposing quotas

or caps on total immigration. But when seeking new immigrants in more prosperous times, it is a shift in source countries that becomes an important additional policy variable. In particular, the ending of the 'White Australia' policy under the Whitlam and Fraser governments in the 1970s symbolised a major shift in immigration policy for the 20th century, removing previous race restrictions and reflecting Australia's geographical position on the edge of a populous Asia.

At the same time as removing race restrictions for immigration, Australia sought to strengthen education and skill criteria for entry, notably through the adoption of a distinctive immigration points system in 1989 following a report from a committee chaired by Glenn Withers (National Population Council 1988). The points approach has been emulated in other countries since. This system, when combined with the development of a major international education sector, facilitated highly educated migrant entry of Asians into Australia (Davis & Mackintosh 2011; Withers 2012), helping prepare this country for the Asian Century (Australian Government 2013).

A nation of 3.8 million people at Federation in 1901 had grown to a population of 22.6 million by 2011 (Table 16.2). The labour force correspondingly grew from 1.6 million in 1901 to 12.3 million in 2011. The ratio of workforce to population was 42.7 per cent in 1901 and 40.2 per cent still in 1961, but then increased steadily to 53.2 per cent in 2011.

The work contribution within the labour force also matters. This reflects the employment rate and the hours of work. The employment rate and the unemployment component of this are discussed, along with the price of labour, under 'Wages and unemployment' below. Hours of work also deserve attention – there was a long-term decline in standard working hours across the 20th century (Table 16.2). The change was quite large, with the average working week falling from nearly 50 hours at the beginning of the 20th century to a low of 36.4 hours in 1984, then steadying and rising back towards 40 hours. The long-term decline in work hours was shared by other developed nations and reflected the work–leisure preferences of workers as their real incomes rose.

Shorter working hours were negotiated by trade unions through the arbitration system (see below). The effects were greatest after 1930 (Macarthy 1969; Nyland 1987). The influence of the arbitration authorities helps explain distinctive changes in work hours, notably moving in fits and starts from a 48-hour standard to 44 hours, then to 38 hours and even 35 hours in some sectors (McKinlay 1979). However, recent decades have seen a levelling out and indeed reversion against the steady long-term trend in growing leisure

Table 16.2 Population and human capital trends, 1901–2011

	Total population (‘000)	Overseas-born population share (%)	Labour-force particip- ation rate (%)	Female labour- force share (%)	Education participation rate (%)	Higher education share (%)	Migrant skill index (1961 = 100)	Weekly work hours
1901	3774	23	42.7	21.1	20.6	0.21	91	49.9
1911	4455	17	44.7	22.5	17.7	0.43	91	48.9
1921	5436	15	42.8	21.0	18.4	0.80	85	47.1
1933	6630	14	41.4	18.1	17.6	0.86	85	45.5
1947	7579	10	42.2	19.0	15.8	2.51	93	40.0
1961	10 508	17	40.2	20.4	20.8	2.66	100	40.0
1971	12 928	20	43.0	26.7	22.1	5.88	116	39.1
1981	14 927	21	45.0	34.5	22.4	9.94	115	36.6
1991	16 033	22	52.9	41.8	22.0	13.75	120	37.1
2001	19 413	23	50.3	44.4	20.2	16.59	124	39.2
2011	22 620	27	53.2	45.6	19.6	20.05	128	39.1

Sources: Pope & Withers (1995); ABS, cat. no. 3412.0 (various dates); ABS (2012i); ABS, cat. no. 6203.0 (various dates).

and less work. Australia has shared the rise in working hours with other Anglosphere nations, such as the United Kingdom and Canada (I. Campbell 2002), but has actually increased average hours worked more than most countries due to the shift away from arbitration to enterprise bargaining (Wooden 2003).

Underlying the aggregate labour-force trends are important structural changes that both reflect and influence the process of economic growth and its nature. Key changes are the decline in participation of younger workers, as years of education and training have increased, and, following many preceding decades of stability, an increase in older worker participation for the last quarter-century (Hugo 2001; ABS 2004b). The trend then is to a more mature workforce. But there is an even greater trend towards a more female workforce.

The share of women in the labour force has doubled since the 1960s. Previous evolution in female workforce participation was documented for the 19th century by Alford (1984) and for the earlier 20th century by Jones (1987) and Deacon (1989). The story after Federation was substantial stability for some 60 years, with wartime exceptions dissipating during peacetime. However, a new era came into being with the emergence of a new pervasive social liberalism, including 'women's liberation', in the 1960s. Accompanied by declining birth rates and rising female education levels, female work participation rates increased steadily across the remaining decades of the 20th century and into the 21st. This was especially the case for married women.

Workforce location has, naturally, correlated with the shift in regional distribution of the Australian population. There was a remarkable stability of relative population distribution for many decades (National Population Inquiry 1975; Brosnan 1984). But in the 1980s dispersion increased, with further reductions in the rural workforce and a significant decline for smaller provincial cities. Even more prominent was the shift to the so-called sunshine states of Queensland and Western Australia and the coastal regions of northern New South Wales. This shift away from what was called the 'rust belt' states was due to the ongoing decline of manufacturing and also of intensive agriculture, accentuated by the economic liberalisation reforms of the 1980s. There was also the emergence of early retirement to warmer climes by the 'baby boomer' generation, and the growth in demand for resources that were predominantly located in the northern and western states. By the early 21st century a notion of a 'two-speed economy' had come and prominence and characterised some of these forces.

It is important to recall that Australia has never been a truly industrial society in its history. This is to say that it has never had a larger share of its population in manufacturing than in services, even at the height of post-World War 2 tariff-enhanced manufacturing efforts (Connolly & Lewis 2010, Graph 1). Agriculture has long been land-intensive and, aside from the 19th-century gold rushes, mining has been capital-intensive. Most Australians have long lived in cities and have worked in services. In an economist's phrase, 'they take in each other's washing'. Politicians in the early 21st century did occasionally hanker after having 'a nation that makes things' and argued the value of some protectionist policies, such as motor vehicle production subsidy, for some time accordingly. But various crises for large manufacturing companies, including in the areas of motor vehicle production, aluminium refining and food processing, increasingly undermined this view into the 2010s.

Agricultural employment, even in 1890, was only 25 per cent of the workforce, well below European shares and below those of other new settlement countries (Withers, Endres & Perry 1987). It is now at 3 per cent. Manufacturing and mining and construction shares have been more variable, but services have employed more than half of the labour force since before Federation. In 2011 manufacturing's share of total employment was 8 per cent, construction's was 9 per cent and mining's 2 per cent. Overall, 77 per cent of workers are in services, with health care representing 12 per cent of total employment and retail trade 11 per cent (ABS 2012e).

The workforce has been employed more in the private than the public sector since Federation and indeed much earlier, although some of the largest individual employers have been public-sector, especially entities such as the railways and post office. At Federation the public employment share was 8.7 per cent of the civilian workforce. This share expanded in the pre-World War 1 period and during World War 2, reaching 31.4 per cent in 1946 (Withers, Endres & Perry 1987). The public-sector employment share reduced in the immediate postwar period to 21.4 per cent by 1951 and then remained steady for almost three decades.

From the 1980s onwards, a wave of privatisations, contracting out and economic liberalisation reduced government employment in economic infrastructure. But employment in social services did expand alongside private employment, notably in education and health. This reflects the higher income elasticities for these services and also the rising demands of an ageing population.

Nevertheless, the Australian government employment share (including public enterprise) remains substantially less than in the developed countries of middle and northern Europe and indeed even such comparators as the United Kingdom and New Zealand. In 2011 the general government employment share stood at 15.6 per cent of the workforce, right at the OECD average (OECD 2012). Within the private sector, self-employment has emerged as a growing share including more work from home aided by digitalisation and the greater married female workforce share. This has been encouraged by the economic liberalisation settings in place from the major industry and labour market reforms since the 1980s.

Investing in workforce skills

The impact of the workforce on the economy operates through the quantity of workers and through the skills of those workers. The productivity of the workforce in conjunction with the environment in which workers function determines national productivity and is reflected in real wages. Australia has long paid workers well by most global standards, reflecting an enviable national productivity. Underpinning this outcome has been the education, training and skill attributes of the workforce. By 1900 compulsory free schooling was producing a literate and numerate workforce – as was required, and rewarded, by the predominantly service orientation of the Australian economy. Secondary schooling and technical and vocational training equipped the workforce in the first half of the century, and in the second half higher education began to grow substantially, especially from the 1970s onwards.

A distinctive Australian pattern of substantial parochial and independent private schooling grew to complement government schools, although private tertiary education was limited and remains so in the university sector. However, private vocational education blossomed later in the century, thus again conforming to the Australian way of providing a public basic safety net in income support and key services complemented by private provision, often subsidised. In tertiary education, government-funding programs and subsidised loans have been gradually extended to private training providers, with full contestability for vocational funding a modern development in key states, commencing with Victoria.

Increasing education of the labour force was complemented by work-based skill formation. The distinctive features of apprenticeship and its link to unions have been a continuing focus of labour arrangements during the 20th century. Modern executive training and professional development

outside the formal government-sanctioned arrangements for qualification recognition are substantial but little analysed (Merrett, this volume). It is a lacuna in effort and depiction, the latter in part because clear categorisation of what constitutes education, skill, training or even R&D or innovation is very blurry beyond formally accredited systems such as degrees or patents.

That said, benchmarking studies ranging from Cyert (1970) to Enright and Petty (2013) have concluded that Australian business management skills have been behind international best-practice standards, despite important exceptions. The associated historical weaknesses at firm level have been examined in Wright (1995) and also Merrett (this volume). Further wider contributing factors may also need consideration. The long 20th-century history of 'protection all round' created a less than enterprising management culture, especially outside the trade-exposed sectors, such as mining. The pervasive role of compulsory arbitration as a key plank of the protection system ensured that human resource management especially was weak, and even post-reform the search by industry for governments to provide 'employment-ready' graduates persists, as opposed to acceptance of any equal reciprocal responsibility by employers to be 'graduate-ready'.

Australian capabilities in public administration have instead emerged as a product of these circumstances, and at the beginning of the 21st century Australia's tertiary education system was widely acknowledged as leading practice in education globally, particularly in these areas: quality assurance, qualifications frameworks, public financing innovation, and competency-based vocational learning (Bradley 2008). Sectoral cooperative institutions in tertiary education were also distinctive relative to most countries, as were broadband development, insurance, international student marketing and recruitment, superannuation, distance learning and shared business services.

Interestingly, the overall share of the population at any one time committed to formal education enrolment has varied modestly since Federation. Putting aside the exigencies of wartime, roughly one-fifth of the population has been occupied in formal education enrolment across the entire period since 1901 (Table 16.2). So, simple unavailability of workers enrolled in education does not explain much of the variation in GDP growth. Demographic and social composition of the education participants and the resourcing and effectiveness of that endeavour, however, is a richer story. In particular, as the youth share of the population has declined with falling fertility, more post-compulsory school education kept enrolment numbers up, as did the extension of studies into tertiary education. Higher education represented 20 per cent of all enrolments in 2011, or some 880 000 domestic students, compared

to a modest 1500 university enrollees in 1901 (Table 16.2). Years of education per person have substantially increased.

Australia's early lead in the 19th century in education participation and outlays per student relative to countries such as the United States and the United Kingdom diminished over the 20th century. Girls' education lagged especially (MacKinnon 1989b), which helps explain Australia's continuing legacy of a lower female labour-force participation rate relative to comparator nations. As the 20th century closed, however, females had become the majority of university students, but Australian child-care access and quality and parenting financial support still lagged behind leaders such as the Scandinavian nations, which display both higher fertility and higher female labour-force participation (Faulkner 1996).

Research on the returns to human capital has consistently revealed a significant earnings premium for education beyond the compulsory schooling years, with the associated rate of return well above the cost of capital (Taylor 2012). What is the contribution of these human capital investments to Australian economic growth? Pope and Withers (1995) suggested that growth in output per head is influenced significantly by changes in aggregate skill levels. They found that from 1930 onwards increases in school enrolments, university enrolments and years of work experience did indeed lead to significant increases in per capita income growth. But there is a mix of achievement and underperformance. For example, had the associated average education test score levels been even higher, matching the top scoring OECD countries, it has been calculated for the 30 years since 1960 that annual per capita GDP growth would have been higher by a further full percentage point (Chapman & Withers 2001). In the later 19th century, there is evidence of Australian leadership in human capital investment, but the 20th century saw some other countries move ahead of Australia (MacKinnon 1989b; Withers 1987). Reviewing education through reports such as those of Bradley (2008) and Gonski (2011) became central to policy debate in the new century.

Alongside the education and training obtained by the native-born, the skills of migrants have been important. The 19th-century story, whether for convicts, gold miners or settlers, was one of importing a supply of quite rich human capital relative to most other countries (Withers 1989). This became less marked into the 20th century as immigration fell under the influence of two world wars and a global depression. When migration revived strongly after World War 2, the emphasis for many years was on raw labour rather than careful selection for advanced skills. But since the 1980s Australian immigration policy has focused on selection according to skills possessed by

the migrants, while allowing for a clear leavening by the refugee and family reunion intake (Table 16.2).

Migration's pay-off for the economy is straightforward in terms of growth: there is a close positive and commensurate relationship between migration and GDP growth. It is also straightforward with respect to migration's influence on macroeconomic balance variables: demand and supply effects broadly balance out for unemployment, inflation and the balance of payments (Castles et al. 1998). But the effect on per capita income and its distribution between native and immigrant residents is more contested. Studies based on time series that allow for scale and scope economies, and for the effects of externalities, agglomeration synergies and behavioural differences, find a strong positive relationship between immigration and incomes, including natives. Static analysis finds more modest but positive per capita effects through skill enhancement, with predominant benefit to immigrants. These latter approaches, though, are typically simulations, not estimations, so that some revisionism in favour of the greater positive benefit interpretations is emerging as a result of increased understanding of the methodological differences (Pincus & Sloan 2012). Naturally, issues such as urban congestion, environmental effects and social cohesion provide important complementary context to the economic discussion (Coleman 2012).

Overall, the contribution of education and training and of migrant skills to underpinning Australian growth, and indeed also to fluctuations and stability in that growth, has been hugely important. However, the detailed content of this contribution remains relatively unexamined from an economic history perspective, even though there is evidence that Australia is at its most prosperous when its human capital formation is most advanced, and when its demography, including migration, supports sustainable and stable growth (Withers 1977). While the world experienced a serious financial crisis in the first decade of the 21st century, strong sustained migration helped Australia weather the crisis better than most, as much through new population inflows as from the good macroeconomic policy and trade with China so often asserted to be the basis for that good performance (ACIL Tasman 2012).

Industrial relations and wage setting

One of the most distinctive features of Australia's labour market history is the rise and fall of the centralised wage-fixing mechanism. The Commonwealth Conciliation and Arbitration Court was created in 1904 with the principal function of preventing and settling industrial disputes. Conciliation implied

an attempt to reach agreement while arbitration meant a decision imposed by one or more judges in the light of relevant evidence. The Court was empowered to provide legally binding settlements of disputes over wages and other working conditions that affected workers in more than one state. After 1904 federal and state regulation coexisted and it was not until the late 1920s that the Commonwealth Court accounted for more than half of all negotiated wage adjustments (Hancock 1984, p. 48).

The landmark decision that shaped the way the system worked was that made by Justice Henry B. Higgins in a 1907 case concerning wages at the Sunshine Harvester Company. The judgment was justified by the *Excise Tariff Act*, which provided remission of excise duty for manufacturers that paid a 'fair and reasonable' wage. In the Harvester Case Higgins prescribed a wage that was justified as the minimum necessary to provide a civilised, if frugal, standard of living for the unskilled workman with a family to support. This established the principle that what became known as the 'basic wage' would be set first and foremost by reference to the cost of living, and from 1914 to 1953 it was linked explicitly to the change in the retail price index.

From the 1920s onwards key wage settlements, notably in the metal trades, were taken as a focal point, or coordinating mechanism, for wage negotiations and awards more generally. Thus, 'what began as a system for settling industrial disputes piecemeal became in the course of its early developments, an instrument for formulating and applying national wage policy' (Isaac 2008, p. 297). Two key features were, first, that the system quickly evolved from conciliation to arbitration, and second, that productivity or the 'capacity to pay' became increasingly important (Withers 1987, pp. 250–2).

Award rates for more skilled workers included a premium or 'margin' for skill over and above the basic wage, determined separately on a case-by-case basis, often as a nominal amount rather than as a percentage. But this process led to 'leapfrogging' in wage claims and so from 1954 onwards explicit secondary margins were established based on that of fitters in the metal trades. In 1967 the basic wage and the secondary margin were consolidated into a single award – the 'total wage'. The Arbitration Court, which was succeeded in 1956 by the Commonwealth Conciliation and Arbitration Commission, also dealt with issues such as paid holidays and the length of the working week. Rates of pay for women's occupations were determined separately and were set at a substantially lower level. But after considerable pressure and a sequence of official enquiries the Commission embraced the concept of equal pay for equal work in 1969 and for work of equal value in 1972 (Isaac 2008, pp. 294–5).

From the 1940s through to the 1970s actual pay rates increasingly exceeded those specified by the Conciliation and Arbitration Commission. Over-award payments meant that wages actually paid diverged significantly from the national awards. Accelerating wage inflation led to the indexation of wages to prices in 1975. The harsher economic climate from the mid-1970s onwards gave rise in 1983 to the 'Accord' between the union movement and the Labor government, which, in its various forms, used the arbitration system to impose a wages policy that also subsumed over-award payments. The implied wage restraint was underpinned by reforms of personal taxation, superannuation, family benefits and Medicare. This was the period of greatest centralisation in wage setting but it also saw the beginning of a movement towards decentralisation. In 1987 a two-tier award system was introduced, with the second tier being tied to productivity gains produced by restructuring and by changes in working practices at the enterprise level (Chapman 1998).

The trends towards decentralised wage bargaining accelerated in the early 1990s, with the 1992 amendments to the *Industrial Relations Act* and the passing of the *Industrial Relations Reform Act 1993*. The *Workplace Relations Act 1996* restricted the powers of the Australian Industrial Relations Commission, abolishing compulsory arbitration and introducing individual wage contracts into the federal system. By 2000 more than a third of employees were covered by individual contracts. Further changes to the system took place with the introduction of the *Workplace Relations Amendment (Work Choices) Act 2005*, which shifted dispute settlement to the local level, and the *Fair Work Act 2009*, which shifted the emphasis to collective bargaining at the enterprise level. Between 2000 and 2010 the proportion of employees whose pay was determined by collective agreements increased from 37 per cent to 43 per cent, while the proportion whose wages were set only by award fell from 23 per cent to 15 per cent (ABS 2011).

Trade unions have been important actors in the Australian labour market. After setbacks in the turbulent 1890s, total union membership at Federation stood at 97 000, less than 7 per cent of all employees (Figure 16.2). Union density grew rapidly to exceed a third of all employees by 1920, and it fluctuated around that level for the rest of the interwar period. Unionism was strongly supported by the expansion of conciliation and arbitration, which depended on the participation of trade unions and invested them with a formal role in the institutional structure (Healey 1972, p. 21; Martin 1975, p. 6; Withers 1987, p. 255). While some unions covered workers in only one state, others combined into national organisations that gave them access to federal arbitration.

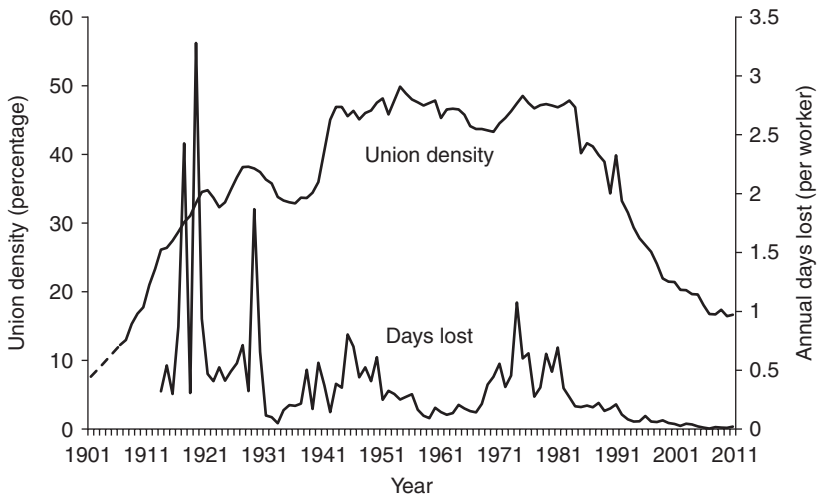


Figure 16.2 Union density and days lost in disputes, 1901–2011

Source: Bhattacharrya & Hatton (2011), Appendix.

In the interwar period the number of unions varied between 350 and 400, with the bulk of the membership in federal unions. They were chiefly organised along occupational lines (reflecting their origins in craft unionism) and industrial lines, with the greatest concentration in sectors such as mining, docks, metal trades, food, transport and building.

As Figure 16.2 shows, the period between the early 1940s and the early 1980s was a high plateau of union influence, with union membership between 40 and 50 per cent of all employees. But underpinning this apparent stability was a decline in the share of manual workers and a rise in the number of white-collar workers. By 1974 half of all unions represented white-collar workers (Martin 1975, p. 26). The high plateau was followed by a steep decline in union membership; from 1984 to 2004 unions lost 1.2 million members and union density sank from 46 per cent to 19 per cent. This decline in unionism can be attributed to a number of factors. One is the trend in the structure of employment, from manufacturing and transport to the service sector and from blue-collar to white-collar. Related to this, the share of workers for whom unionism was compulsory (closed shops) fell from around a half in 1980 to a fifth in 1995 (Wooden 2000, p. 14). Also important, according to some observers, was the growing disillusion (which began under the Accord) of rank-and-file members

with their leadership and with the benefits of union membership (Bramble 2008, pp. 130, 154–5, 176–8).

Figure 16.2 shows how strike activity has varied since 1913. This is represented by the annual number of days lost per worker; it includes lockouts as well as strikes, but these are only a very small proportion of the total. There were sharp peaks in strike activity in 1917 and 1919, which occurred in the context of wartime labour scarcity, opposition to conscription, and the erosion of real wages by inflation. During the 1920s there was a sequence of major disputes culminating in spectacular strikes in the maritime, timber and coal industries in 1928 and 1929, rising to a peak in the economic downturn of 1930. Although days lost per worker year averaged only 0.82 between 1913 and 1930, this was nevertheless a period of considerable strife and turbulence in industrial relations. Underlying it was the tension between slow growth in labour productivity, and workers' aspirations for higher wages and shorter working hours. Industrial disputes decreased in the 1930s, not because these aspirations were satisfied but because high unemployment weakened the bargaining strength of organised labour.

As Figure 16.2 shows, there were two further surges in strike activity, although not on the scale of 1913–30. The first was during the decade of the 1940s. Restraints on wages during World War 2 led to rising claims for increases in the basic wage, the restoration of margins, and a shorter working week. There followed a period of quiescence as these issues were resolved in a climate of strong economic growth. Throughout the period strikes were illegal and in 1951 legislation was passed to fine unions (the so-called 'penal provisions'), which was enforced from 1956 by the Commonwealth Industrial Court (Healey 1972, ch. 18). Renewed industrial strife arose in the late 1960s, particularly over the utilisation of 'work value' in setting margins; also contested was whether over-award payments could be 'absorbed' in higher award rates. Increasing fines and the imprisonment of a union official in 1969 led to mass protests and the scrapping of the penal provisions. The elimination of this sanction fuelled strikes in which labour market issues became entangled with protests over the Vietnam War (Bramble 2008, pp. 46–9). Against this background the Accord, which included a 'no extra claims' (or no-strike) clause, seems to have been remarkably successful in restoring industrial peace after its introduction in 1983. Studies of its effect suggest a reduction in strike activity of 35–50 per cent (Chapman 1998, pp. 634–6). However, strike activity remained at historically low levels even after the end of the Accord.

Wages and unemployment

The emphasis in the Harvester Judgment on raising the living standards of the least skilled workers was given a further twist by World War I. As a result there was a substantial reduction in differentials between skilled and unskilled workers after 1901 and into the early 1920s (Macarthy 1972). There was also a distinct narrowing of differentials across states and between industries, although it is not clear how much of this can be attributed to the arbitration system. Studies of the wage structure in the early part of the century to 1930 (Pope 1982), and for the postwar period (Freebairn & Withers 1977; Norris 1986) found that, across occupations and industries, the wage structure strongly resembled that in other countries, such as the United States and the United Kingdom, but with much less dispersion, especially between blue-collar and white-collar workers. However, relative wages were somewhat responsive to shifts in supply and demand for labour (Keating 1983; Withers, Pitman & Whittingham 1986). Since at least the 1970s there has been a progressive increase in the dispersion of individual earnings (Norris & McLean 1999; Borland 2012), due to a rapid increase in the relative demand for skilled workers that has been amplified since the 1990s by labour market deregulation.

Perhaps the most dramatic change in wage differentials was that between women and men. In the interwar years the female wage was set at just 54 per cent that of men, a figure that was raised to 75 per cent in 1950. The advent of equal pay in 1969, and of equal pay for equal work in 1972, dramatically raised female wages. The average award wage for women relative to men rose from 71 per cent in 1968 to 93 per cent in 1978, whereas the ratio of average weekly earnings rose from 58 to 76 per cent (Figure 16.3). Some of the remaining divergence can be accounted for by gender differences in occupational structure, working hours, and over-award payments. But the unexplained component, often attributed to discrimination, fell from more than a third of the male wage to around 10 per cent (Borland 1999, p. 267). Perhaps more striking is the fact that the growth in women's employment was only slightly slowed by the sharp wage increase (Gregory & Duncan 1981, p. 421).

The effects of the system on overall wage levels are much more difficult to assess. Some economists have suggested that highly centralised wage setters are likely to take into account the economy-wide effects of their actions and therefore to fix wages at levels and growth rates consistent with high employment (Calmfors & Driffill 1988). Yet international comparisons have cast doubt on that view (Coelli, Fahrner & Lindsay 1994). Between 1907 and

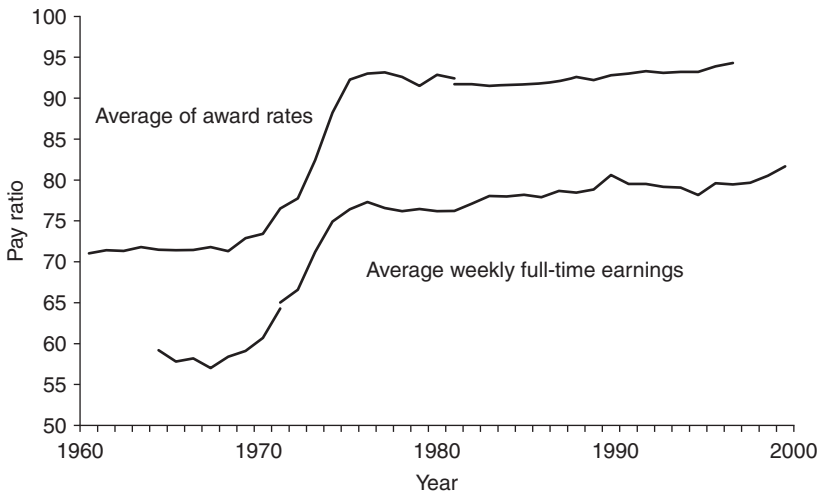


Figure 16.3 Female-male pay ratios (%), 1960–2000

Sources: Gregory & Duncan (1991); Borland (1999). Data kindly supplied by Jeff Borland, University of Melbourne.

1930 the effect seems to have been to raise wages relative to productivity, creating a ‘wage overhang’ (Pope 1982). As Table 16.3 shows, the ratio of real wages to productivity was higher after 1920 than before (row 4). From the 1940s onwards real wages grew more rapidly than earlier in the century (row 3). But from the early 1970s onwards the wage aspirations that had been established in the early postwar decades, backed by strong union power and underpinned by the arbitration system, conflicted with harsher economic conditions. As a result the real wages/productivity ratio increased further in the 1980s. But, as we have seen, the system itself came under growing pressure, and although its life was extended by the Accord, this ultimately gave way to deregulation.

The most widely used index of labour utilisation is the unemployment rate. Figure 16.4 shows the wide variations in the unemployment rate since Federation. From 1901 to 1929 it varied around an average of 5 per cent before ascending steeply to a peak of 20 per cent in 1932. The recovery from the Great Depression saw unemployment fall dramatically to reach an all-time low of 1 per cent in the wartime years of 1943–44. For three decades until 1974 fluctuations were mild and the unemployment rate averaged less than 2 per cent. From that time unemployment drifted upwards, with sharp

Table 16.3 Labour market and economic trends, 1901–2011

	1901–21	1922–41	1942–71	1972–91	1992–2011
1) Growth rate of nominal weekly earnings (% p.a.)	4.95	1.11	6.95	10.23	4.16
2) Growth rate of consumer price index (% p.a.)	3.13	0.40	4.51	8.82	2.56
3) Growth rate of real wage (% p.a.)	1.83	0.71	2.44	1.41	1.60
4) Growth rate of labour productivity (% p.a.)	0.78	0.90	1.97	1.72	1.51
5) Real wage/productivity (1950 = 100)	72.2	99.9	95.5	112.1	94.5
6) Consumer price/GDP deflator (1950 = 100)	118.6	105.7	101.2	91.8	95.9
7) Direct tax share of GDP (%)	1.1	4.0	9.6	14.1	12.1
8) Trade union density (%)	20.4	35.0	46.2	44.3	21.7
9) Unemployment benefit/wage ratio (%)	n/a	n/a	16.35	22.78	23.84
10) Real long-term interest rate (%)	1.21	4.40	-0.18	1.76	3.34
11) Structural change index	7.79	3.8	2.8	2.2	1.6
12) 'World' income growth (% p.a.)	1.64	2.93	3.44	2.70	2.08
13) Fuel price/GDP deflator (1950 = 100)	132.9	89.0	61.8	148.4	116.4
14) Unemployment rate (%)	4.74	9.44	1.85	6.16	6.75

Notes: Row 12 is real GDP growth in Western Europe and North America. Row 11 is calculated as the dispersion of annual employment growth rates across sectors.

Sources: Sources as listed in Bhattacharyya and Hatton (2011), except row 9, which is an average of replacement rates for different worker types from the OECD (<http://www.oecd.org/els/social/workincentives>).

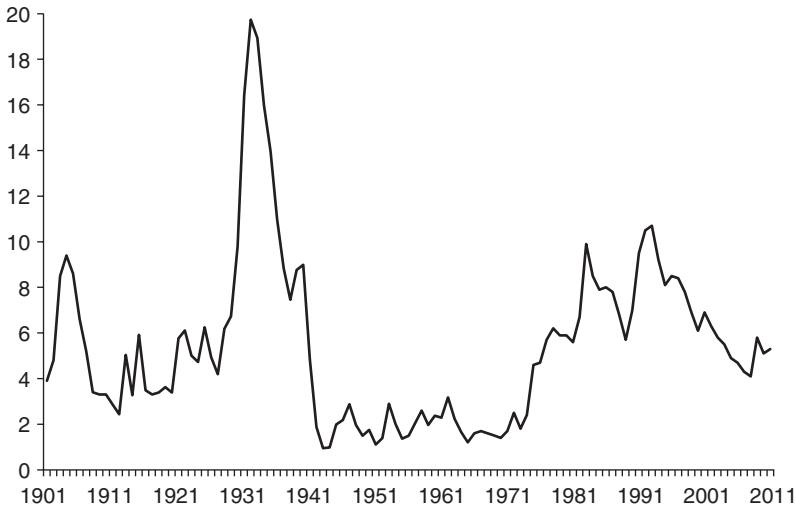


Figure 16.4 Unemployment rate %, 1901–2011

Source: Bhattacharrya & Hatton (2011), Appendix.

peaks in the early 1980s and the early 1990s. From 1993 onwards the unemployment rate trended downwards, dipping below 5 per cent in 2006, a level last seen in the mid-1970s. In good times and bad times, workers move in and out of jobs, but when unemployment is high they remain unemployed for longer. In 1933 two-thirds of the unemployed had been without work for more than a year; in the recession from 1989 to 1993 the share of long-term unemployment increased from less than 25 per cent to more than 40 per cent (Borland & Kennedy 1998, p. 81). As duration increases skills atrophy and motivation declines, making it harder for the ‘hard core’ unemployed to get back into work.

Aside from short-term fluctuations, what really stands out is the period of low unemployment rates during the high plateau of unionism and arbitration from the early 1940s to the early mid-1970s. A number of factors helped to sustain low unemployment. One is strong growth of demand for labour in the early postwar period, as ‘world income’ grew faster than before 1942 or after 1973 (Table 16.3, row 12). While buoyant labour demand strengthened wage demands, other factors were keeping firms’ costs down. One was interest rates, which, in real terms, kept the costs of capital and investment relatively low (row 10). Another was low fuel prices (row 13). But above all, labour productivity grew more rapidly in the postwar period than in the first

four decades of the century. This meant that the wage pressures brought on by tight labour markets were not fully passed through into price inflation. After 1973, productivity growth faltered, and interest rates and energy prices stayed higher in real terms than in the previous era.

Several labour market features had more marginal effects. It is sometimes argued that structural change leads to labour market bottlenecks and thus to higher unemployment. This was somewhat less rapid after World War 2 than before (Table 16.3, row 11). Another issue is cash benefits for the unemployed; the higher the unemployment benefits, the longer workers would commit to search for a new job or to hold out for higher wages. Tax-financed, means-tested unemployment benefits were introduced in 1945, rates were raised in the 1970s and eligibility was widened in the 1980s. But these have never been particularly generous relative to wages (Table 16.3, row 9) and in the late 1990s work requirements were introduced. A further issue is the rising share of workers' income taken in tax, some of which was passed through to wage claims (row 7), but again the effects on unemployment were modest.

Debates about the impact of wage policy have recently been reassessed (Bhattacharyya & Hatton, 2011, pp. 214–16). First, it has been suggested that the wage policy stemming from the Harvester Judgment led to higher unemployment throughout the 1920s (Pope 1982; Forster 1985b). The 1907 decision increased the basic wage by 27 per cent, but its effect on all wages was smaller and it did not become effective until 1912 (Isaac 2008, p. 288). During World War 1 the real wage was eroded as wage awards lagged behind inflation. As a result, by 1920 unemployment was 1.8 percentage points lower than otherwise. In 1920 an enquiry into the basic wage (the Piddington Commission) recommended an upward adjustment. This raised the real wage by about 15 per cent in 1921 and increased unemployment by about 1.2 percentage points between 1922 and 1925.

Greater controversy surrounds the effect of the 10 per cent wage cut imposed in 1931 to combat unemployment during the Great Depression. Despite the attention it has received, the effect is not discernible in industry-level real wages (Gregory, Ho & McDermott 1988, pp. 223–4). This is partly because some state tribunals did not follow the Commonwealth Court (Sheldon 2007), and partly because margins and other components of the wage were not adjusted in nominal terms despite falling prices (Seltzer 2003). Clearly the 1931 wage policy had very little effect, but had it succeeded it would have cut nearly 3 percentage points off the unemployment rate in 1932–33, falling to about one percentage point in 1936 (see also Valentine 1988, p. 186).

One of the biggest wage shocks in the postwar period was the so-called wage explosion of 1973–74, which was associated with the breakdown of the wage-setting process (Nieuwenhuysen & Sloan 1978). Despite rapid inflation following the oil-price shock, the ‘wage push’ more than compensated for the increase in the cost of living and this real-wage increase was locked in by the reintroduction of indexation from 1975 onwards. By 1982 the effect was to increase the unemployment rate by about 1.8 percentage points. In the midst of economic turbulence these effects are rather uncertain and thus it is not clear how far they were reversed under the Accord. One study suggests that the Accord cut real wages by about 10 per cent (Chapman 1998, p. 637). If so, then this would have largely reversed the effect of the wage push, although it did little to stem the underlying rise in unemployment.

Finally, we turn to the labour market reforms of the 1990s. As we have seen the corporatist approach to wage setting was progressively abandoned with the introduction of enterprise bargaining. Ironically, deregulation seems to have unleashed labour market pressures that had been suppressed by the Accord. Thus deregulation alone raised the real wage, adding about 1.5 percentage points to the unemployment rate between 1997 and 2007. But on the other hand it substantially weakened organised labour’s hand in bargaining, as reflected by the steep decline in trade union strength. The latter effect reduced unemployment by about 2.3 percentage points over the decade, which more than compensated for the direct effect of enterprise bargaining (Bhattacharyya & Hatton 2011, p. 216).

Conclusion

In the 20th century a little regulated and rapidly growing labour market was transformed following the depression of the 1890s and Federation in 1901. Over the course of the century a comprehensive arbitration system grew to significantly influence working conditions and work arrangements, accompanied by substantial unionisation of the workforce. Immigration flows augmented domestic workforce growth in a situation of ultimately diminishing fertility, but migration was severely disrupted by the two world wars and the Great Depression.

Handling the Great Depression and then the postwar long boom became the dominant features of labour market operations over this century. However, by the end of the 20th century, enterprise bargaining in the workplace and a comprehensive social safety net through welfare provision had displaced much of the arbitration and unionism that had characterised the

period. Immigration had returned to high levels and increasingly to a skills focus, and it was now very culturally diverse. The workforce was augmented by major increases in female participation and became much more skilled and educated, although questions remained as to whether human capital investment had been optimal for fully realising Australian potential over time.

Real wages did grow substantially in the second half of the century and a tendency for nominal wages to contribute to inflation was curtailed under the new regulatory and macroeconomic policy settings. A resurgence of productivity from the microeconomic reform era of the 1980s and 1990s was dissipating by the second decade of the 21st century and was being seen as the dominant concern for future policy.

The service economy

MONICA KENELEY

Introduction

The service sector dominates the Australian economy. At the beginning of the 21st century it accounted for more than three-quarters of output and 80 per cent of employment (McLachlan, Clark & Monday 2002). The service sector has been referred to as the 'Cinderella sector' because it is one of the least understood sectors of the economy (Daniels 1993; Miles & Boden 2000). A key problem in this respect is its heterogeneous nature: it is highly diversified, making it difficult to draw overall conclusions about its development and linkages to other parts of the economy. In acknowledging the growing significance of the service economy, this chapter reviews the pattern of growth and places the Australian experience within the context of broader worldwide trends. In doing so it addresses a number of questions. What has been the pattern of development? How can this pattern be explained? What are the drivers influencing sub-sector development? What contribution does the service sector make to broader economic welfare?

Defining the service sector

The nature of the service sector makes it very difficult to classify in a meaningful way. Services may range from high-skilled, knowledge-driven activities to low-skilled and low-paid occupations. Conventional methodologies of classification do not fully capture the diversity and complexity of the range of services provided (Pilat 2001). There is no generally accepted definition of services; in fact, services have been more commonly defined by what they are not rather than what they are.

A. G. B. Fisher (1935) and Colin Clark (1940) were among the first to identify and classify service activities. In classifying economic activity into particular types they distinguished between primary, secondary and tertiary industries.

While primary and secondary industries fitted neatly into a definitional model, the tertiary sector was assumed to incorporate all other economic pursuits. It was the 'residual' after the other two sectors were accounted for.

The diversified nature of the service sector not only creates definitional problems, but it also makes classification for evaluation purposes difficult. The conventional approach adopted has been to rely on an industrial classification system. In Australia this has been the ANZSIC. Following the Fisher/Clark model of the three-sector economy, industries are classified according to whether their key functions are agriculture, mining, manufacturing or service. Fourteen industry groups fall within the service category, ranging from trade to education, government, recreational and personal services. However, such systems of classification have been criticised as not useful. They tend to understate the degree of integration between manufacturing and services and the sector's increasing complexity (Pilat 2001).

Differing approaches to classifying services have emerged in the last three decades. A common theme has been the need to disaggregate data in order to provide an analytical tool that would encourage deeper insights into the nature and development of the various components of the sector.

An outcome of this work has been an increasing focus on a more market-based approach to classification. Browning and Singelmann (1978) proposed a modification of the Fisher/Clark three-sector model, suggesting that a six-sector model was more practical. The major difference in this approach was that the service sector was divided into more homogenous groups. Furthermore, these groups were assumed to be sectors in themselves and not sub-sectors of the tertiary sector. The sectoral analysis undertaken by Browning and Singelmann distinguished between distributive services (transport and commercial trade), producer services (services to other industries), social services (health and welfare) and personal services (services to individuals). Elfring (1989a) adopted a similar classification, although he did not see each sector as discrete but rather as sub-sectors of the broader service sector. A benefit of this type of classification is that it enables trends in particular types of services to be more easily identified and analysed. However, such typologies have been criticised because they don't capture total employment in services. By focusing on industry – that is, service-producing firms – the contribution of 'in-house' services are not included (McLachlan, Clark & Monday. 2002).

The approach taken in this chapter is based on the taxonomies used by Browning and Singelmann (1978), Elfring (1988) and McLachlan, Clark and Monday (2002). The service sector is divided into five service

categories: producer, distribution, social, personal, and construction and utilities. Producer services are distinct from consumer services. They relate primarily to production and investment decisions and support these processes. Elfring (1989a) suggests that the focus is largely on the transfer of knowledge and information. Included in this category are financial and accounting services. Distribution services refer to the circulation and dissemination of commodities and information. Transport and trade make up the bulk of services in this category. Personal services are linked to consumer demand and, therefore, income. The range of activities within this category varies from entertainment and recreation to domestic services and accommodation. Social services are differentiated from personal services by the nature of the providers. Such services tend to be provided by government, professionals and not-for-profit organisations. Health, education and other government services fall into this group. The final category is construction and utilities and includes building and non-building construction and the provision of electricity, gas and water. Table 17.1 summarises the classification of services.

Patterns of development

The growing sophistication of colonial economies from the mid 19th century onwards encouraged the growth of service industries. By the time of Federation in 1901, nearly 50 per cent of the workforce was employed in a range of service-sector activities. Key drivers of this expansion were the growth of the agricultural and industrial sectors, urbanisation and the emergence of a middle class. Ville (this volume) highlights the growth of the wool industry and the impetus it provided for business and economic development in the colonies. It also created the demand for supporting services to facilitate the production and marketing of the wool clip. As pastoral enterprises grew in the 1840s, the demand for specific services to support expansion increased. Stock and station agents emerged to deliver sales services (Ville 2000, 2009). As the industry continued to expand, these services grew to encompass a wide range of facilities, from the provision of materials to financing and broking. Over time the more successful agents grew to form the large pastoral companies, such as Dalgetys and Goldsborough Mort, that have played an intrinsic part in the history of the wool industry.

From the 1860s onwards a sustained period of economic prosperity encouraged the growth of the services. Real GDP grew at an average of 4.8 per cent in the period 1861–89. Although colonial populations were increasing, per capita GDP expanded at a rate of 1.3 per cent (Maddock & McLean 1987).

Table 17.1 Service classification

Sub-sector	Services included
Producer services	Banking and financial services Insurance Property management services Engineering/construction/architectural services Business/accounting Legal services Miscellaneous business services
Distribution services	Transport Communication Wholesale trade Retailing
Personal services	Accommodation Hotels, bars/restaurants Domestic service Recreation and entertainment Other personal services
Social services	Health and medical Education Welfare services Services provided by not-for-profit organisations Services provided by government Miscellaneous social services
Construction and utilities	Electricity, gas and water supply Sewerage and drainage services Building and non-building construction Construction trade services

Sources: McLachlan, Clark & Monday (2002); Elfring (1989a); Browning & Singelmann (1978).

An outcome of this trend was the increased demand for a wide variety of services. Construction services increased as the demand for housing increased. Associated with this was the emergence of a variety of specialist financial institutions to service the need for funds. Permanent building societies and savings banks were established specifically to finance house building. The growth in per capita income and the emerging middle class also led to a demand for other types of financial products, such as life insurance.

The appearance of large mutual insurers, such as AMP, National Mutual and Colonial Mutual, occurred at this time.

Further impetus for the development of the service sector came with the growth and expansion of the capital cities as centres of industrial and commercial activity. Frost (this volume) outlines the progress and pace of urban development. Twenty-five years after it was founded, Melbourne was ranked with the largest cities in North America in terms of its population. The cities of Sydney and Adelaide expanded in a similar manner (Frost 1998). As capital cities expanded, the need for specific services grew. The supply of different modes of transport services increased in response. Cable trams were introduced into cities such as Melbourne in the 1880s. Suburban rail networks also expanded at this time to further cater for the urban traveller. Governments played an active role in the provision of rail transport both in urban and country areas. They also accepted responsibility for the delivery of utilities such as water, sewerage and electricity.

From the 1880s economic growth and its associated increase in disposable income fostered the development of new industries designed to cater for the leisure activities of the growing middle classes. The uniqueness of the Australian landscape encouraged travel as a pastime. Excursions to the seaside, mountain ranges and caves became a popular form of entertainment from the mid 19th century onwards. The spread of rail networks and more regular coach services further contributed to the appeal of these activities. Services grew to provide the necessary amenities. Accommodation in the form of grand hotels and chalets provided luxury experiences for the wealthy. Those with a more restricted budget were able to find less extravagant service in one of the myriad guest houses that clustered around resort towns such as Lorne in Victoria or Katoomba in the Blue Mountains of New South Wales (Davidson & Spearrit 2000). The appeal of the guest house and grand hotel was the level of domestic comfort provided. Meals and entertainment were supplied and servants employed to wait on guests. The network of services that grew to support and maintain this activity formed the early basis of a tourist industry that has become an integral part of the fabric of the Australian economy.

The history of service development in the 19th century was one of response to the transformation of colonial agricultural economies into industrial and urban states. Many of these services were new, reflecting both the development of more modern business practice and the diffusion of new technologies. The trends in service delivery established at this time provided the foundation on which the sector developed in the 20th century.

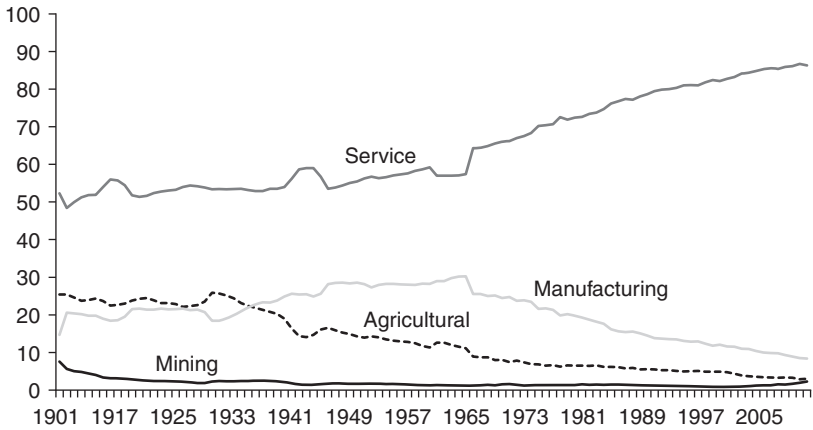


Figure 17.1 Percentage of persons employed, 1901–2010

Sources: Butlin & Dowie (1969); Keating (1967); Foster (1996); ABS (1967); ABS (1997–2011).

The contribution of the sector to employment opportunities, the combination of public and private provision, and responsiveness to the demands of the rest of the economy are characteristics that have determined the pattern of growth into the 20th century.

The relative trends in the service sector's share of employment are illustrated in Figure 17.1. It has increased progressively since the mid-1960s and in 2010 employment in services represented 86 per cent of the total employed. In comparison, manufacturing has never accounted for more than 30 per cent of employment, a rate that it achieved in the mid-1960s at the height of the postwar boom. Since that time, manufacturing's share has declined continuously, to a point where it fell below 10 per cent in 2007. A similar pattern is evident in employment trends in agriculture, which have continued to decline in the post-World War 2 period and have been less than 10 per cent of total employment since the 1960s. Employment in the mining sector has been relatively stable by comparison but has remained at less than 10 per cent of the total over the past century.

Employment data may present an inflated estimate of the significance of the service sector, which tends to be more labour-intensive than other sectors. However, it is corroborated by output data that also points to the importance of this part of the economy. In 1901 services represented 49 per cent of GDP compared with manufacturing at 11 per cent, agriculture at 19 per cent and mining at 11 per cent. In 1995 services accounted for 64 per cent, manufacturing 16 per cent, agriculture 3 per cent and mining

4 per cent (Foster 1996). In line with employment data, the service-sector share of GVA is large compared to other sectors of the economy. In 1975 the proportion of GVA attributed to services was 70 per cent. This had risen to 79 per cent in 2010. Over a similar period of time the GVA of mining had risen from 8 per cent to 9 per cent. Manufacturing had fallen from 19 per cent to 10 per cent and agriculture from 4 per cent to 3 per cent (ABS 2012c, Table 6).

The service sector has historically represented a significant share of output and employment. This has implications for the overall performance of the Australian economy. The sector has often been characterised as being a 'productivity laggard'. International comparisons suggest that the Australian service sector has performed well in terms of productivity. Broadberry and Irwin (2007) report that labour productivity in the Australian service sector grew more slowly than in Britain before World War 1. However, in the post-World War 2 period productivity growth exceeded that of the United Kingdom. One explanation for this differential may lie in the structural rigidities of the British economy. In analysing comparative British and American productivity data, Broadberry and Ghoshal (2002) conclude that labour productivity was greater in the United States principally because of trends in services. In this respect it was the emergence of the modern business enterprise and associated adoption of technological innovations, particularly in the market service industries, that drove productivity improvements in that country. Conversely, it was the slower growth of the modern business enterprise in Britain that retarded productivity growth in that country. The Australian experience of service-sector productivity lies between these two countries. There is no consistent data indicating long-term productivity trends; available evidence points to conflicting trends in the postwar period. A snapshot of selected services presented by Carter (1987) indicated that labour productivity in producer services such as finance grew at a rate of 1.3 per cent in the decade 1949–51 to 1959–61 and then at –0.2 per cent between 1970–71 and 1980–81. In fact, for that decade labour productivity in all other major services, with the exception of transport and communication, grew at a rate of less than 1 per cent. During that time, productivity in agriculture grew at a rate of 2.1 per cent, mining 3.7 per cent and manufacturing 2.8 per cent. McLachlan, Clark and Monday (2002) make the point that relatively low productivity growth recorded by some services may be a reflection of difficulties in accounting for quality improvements. Thus, early data on productivity in services can only provide an approximate measure of contribution. All the evidence suggests that labour-productivity rates in the 1970s

were substantially less than other sectors of the economy. However, it is not possible to determine the exact magnitude of this difference.

The application of more sophisticated data collection and analysis tools has improved estimates of service-sector performance. McLachlan, Clark and Monday (2002) find that average labour-productivity growth in Australia between 1984 and 1998 was marginally above the OECD average. Average annual productivity growth between 1984 and 1998 was estimated to be 2.4 per cent for agriculture, 2.3 per cent for mining and 1.5 per cent for manufacturing. Productivity growth in services as a whole was 1.4 per cent. This compares to the United States, which had an average growth rate of 0.9 per cent for the same period. Sections of the service economy such as utilities and communications have experienced average growth rates in excess of this. For the same period, productivity in utilities grew at an average annual rate of 8.4 per cent and communication 4.6 per cent (McLachlan, Clark & Monday 2002).

The diverse nature of the services makes it difficult to draw absolute conclusions about the productivity of the sector. A more detailed analysis of productivity trends is given in Madsen (this volume). From the brief outline above it would appear that the Australian experience compares favourably to other countries. However, it is evident that some services consistently outperform others. Utilities and distribution services are the leaders in this respect, with rates of growth consistently above the average.

Drilling down into the patterns of growth within the sub-sectors, the rise and decline of certain industries becomes more apparent. Table 17.2 provides a picture of what is happening in the various services sub-sectors.

The growth in producer services, which is consistently above that of total service-sector employment, reflects the maturation of the economy and the changing nature of the business enterprise. Studies of the patterns of change in employment in producer services in other regions, such as Europe and the United States, suggest that the jump in the demand for producer services increased after World War 2 (Elfring 1989b). This also appears to be the case in Australia. The increase in employment during the decade of the 1940s occurred after 1945 and continued for the next decade or more. A key factor in this shift has been attributed to the emergence of the multidivisional (M-form) enterprise. The move to a divisional structure encouraged a shift away from in-house production of all ancillary services to the outsourcing of these functions (Elfring 1989a). This, together with the application of new office technologies, led not only to the growth of producer services but also to an increase in their productivity (Broadberry & Ghoshal 2002).

Table 17.2 Percentage change in service-sector employment, 1910–2009

Year	Producer services	Construction and utilities	Distribution services	Personal services	Social services	Total services, including other services
1910–19	26	10	19	6	34	18
1920–29	30	19	16	7	16	15
1930–39	11	39	15	13	33	23
1940–49	38	37	27	6	–17	17
1950–59	32	16	16	–2	27	17
1970–79	21	5	12	16	38	19
1980–89	38	16	14	11	35	24
1990–99	15	4	8	27	14	14
2000–09	23	32	15	14	27	22

Notes: No data is available for the years 1962–65 so this decade is not included in the table. Value for construction and utilities for 1970–79 is an estimate.

In 1994 the ANZSIC was introduced to the collection of labour-force survey data. This was backdated to 1985. Prior to that, data is based on ASIC classification.

Sources: Calculated on data provided by Butlin and Dowie (1969); Keating (1967); Foster (1996); ABS (1967); ABS (1997–2011).

The upward trend in employment in producer services was broken during the decade of the 1990s. A closer inspection of the data for that period indicates that the reason for this was a decline in employment in the finance and insurance industries. The decline in this area is most likely attributed to the market adjustment in the wake of the financial market deregulation. The privatisation of government banks, demutualisation of major insurers and increased international competition were associated with industry restructuring that saw employment in this sector fall.

Employment in distribution services did not grow as rapidly as producer services or construction and utilities. For most of the century the trend was less than that of the total service sector. Wholesale and retailing comprise the largest share of employment in distribution services. During the 20th century the nature of this industry progressively evolved from being characterised by the small shopkeeper at the start of the century to being dominated by large retail giants at the end. The spread of online technologies in the 21st century continues to place pressure on the business models of retailers. The first department stores emerged in the late 19th century as entrepreneurial businessmen took advantage of marketing opportunities. David Jones, Grace Brothers, Myers, and Hordern and Sons developed as retail empires at

this time. In the 1920s a further innovation, the chain store, appeared. Based on the American concept of 'cash and carry', these stores presented a new approach to retailing, allowing goods bought in bulk directly from suppliers to be sold to the public at reduced prices. Direct buying from manufacturers reduced the need for wholesale services. The expansion of this model after World War 2 inspired the creation of suburban shopping malls. In the later part of the 20th-century, mergers and acquisitions further changed the retail environment, with retail conglomerates such as Wesfarmers and Woolworths dominating the landscape.

The types of employment opportunities available in personal services have changed quite markedly since the beginning of the 20th century. At that time most jobs were in domestic service and the majority of those employed in that area were women (Carter 1987; Higman 2002). The advent of domestic labour-saving devices and rising wage costs were associated with reduced employment opportunities. In the last three decades employment opportunities in Australia have increased in line with the experience in Europe and the United States (Elfring 1989a). The increased participation of women in the workforce was one factor that contributed to this trend. This has been associated with an increase in the number of two-income families. The resulting increase in discretionary income created a demand for a wide range of personal services. Some replaced those conventionally undertaken by women in the home; others fostered the growth of a range of new types of entertainment and lifestyle businesses.

Social services are closely linked to government commitment to essential services, such as defence, education, health and welfare. In both world wars employment in social services grew as the country was put on a war footing. The return to peacetime activities in both cases saw a fall in employment in this sector. A more sustained increase, however, occurred with the expansion of the mixed economy in the postwar period. The years of the Whitlam government (1972–75) represented a period of significant support for these services. The extension of specific services such as children's, women's, aged and disability services occurred at this time (Harris & McDonald 2000). Later falls in the rate of employment growth after 1990 were associated with the exit of government from many of these services.

The pattern of employment growth, particularly in the latter half of the 20th century, reflected that of other western economies (Elfring 1989a). The growth of employment in producer services was consistently above that of the sector as a whole. There was a slowdown in the growth of opportunities in social services and an increase in personal services. The breakdown of

data into sub-sectors highlights the variability in the contribution of different types of services and points to links with broader socioeconomic trends that are not so apparent at an aggregate level.

Explaining the contribution of services to the economy

Early attempts at explaining the pattern of growth in services date back to the works of Fisher (1935) and Clark (1940). The Fisher/Clark hypothesis suggested that long-run development was associated with structural change as the economy moved from an agrarian base to an industrial base. Fisher argued that as the economy developed and incomes rose, the demand for services would increase, leading to an expansion of service-sector employment. Clark, on the other hand, while acknowledging that high income elasticities were a factor, focused more on the supply side. He considered that lower productivity growth in the service sector relative to the other sectors would lead to an increase in employment in that sector (discussed in Carter 1987). Whatever the driver, both Fisher and Clark felt that over time there would be a sustained movement of resources into the service sector of the economy. The implication of this approach for the modern economy was that as per capita income increased, there would be a discernible shift, both in terms of output and employment, to the service sector.

The Fisher/Clark model has been criticised on several fronts. Later studies suggest that the relationship between income and the proportion of services to GDP is not as strong as first believed (Summers 1985; Schkett & Yocarini 2006). The crux of the criticism was that the model was an oversimplification of the development process that failed to fully take account of the diversity of the service sector (Katouzian 1970; Browning & Singelmann 1978; Dowie 1970).

In the 1970s the debate over the contribution of services to modern industrial economies was extended with new contributions from sociologists, geographers and political scientists. The theory of the post-industrial society suggested that with growing affluence spending patterns became more sophisticated. Consumer preferences shifted to services that were seen as 'superior' goods. The outcome of this trend was to move the pattern of demand away from the goods sector to the service sector. The result was an increase in employment and output in that sector. An upgrade in the labour force was also associated with this process as the growth of the service sector was associated with an increase in skilled and professional workers (Bell 1973; Miles 1993).

An opposing argument was to see the growth of service industries in a negative light. William Baumol (1967) put forward a model of unbalanced growth, in which he distinguished between sectors of the economy that were 'progressive' and associated with rising labour productivity and those that were not. In non-progressive sectors of the economy, productivity increased very slowly, if at all. In this respect the expansion of service-sector employment occurred because of differentials in productivity growth, not a shift in demand for service products. This trend had implications for the wider economy. Productivity growth was shared across the economy in the form of rising wages. This meant that the cost of providing fewer productive goods and services increased over time. Lack of productivity growth in the service sector leads to what is known as Baumol's 'cost disease' (Baumol 1967; Schkett & Yorcarini 2006). At an aggregated level, empirical evidence of productivity differentials from the 1960s has supported Baumol's thesis. Withers (1980) argues that such pessimism is not fully warranted. In a study of the performing arts industry he found that the wage-productivity relationship that produced changes in relative costs could also produce positive effects on demand. The income effect associated with wages growth was found to be of sufficient magnitude as to encourage growth in attendance rates and contribute to supporting the future growth of the industry.

The broader contributions of service-sector industries

The service sector has made a substantial contribution to net economic welfare in a variety of ways. In this section three themes are investigated. These themes, professionalisation, innovation and regulatory influences, all reveal more of the significance of the service sector to the economy.

Professionalisation

As the economy has developed in the 20th century, service industries have become more sophisticated, requiring greater levels of skills and qualifications. The development of services has been associated with the professionalisation of industries, resulting in higher-level activities that in turn have provided the foundations for further economic growth. Boyce (2006) argues that the professions and their respective associations act as systems that support difficult transactions, involving abstract, procedural and embodied knowledge, that are required to sustain growth. Many of the skills involved in the provision of services, particularly producer and social services,

are knowledge-based. Accounting, legal, medical and health services, for example, all involve a high degree of specialised knowledge. The professions have played a vital role in furthering knowledge systems, creating standards of quality and ensuring the credibility of specialised information. In doing so, they have supported the continued transmission of knowledge and skills.

The relationship between business and the professions has encouraged a two-way flow of information and knowledge. Businesses gained from the expertise provided by engineers, accountants and lawyers, to name just a few. On the other hand, it was the support provided by business that allowed the practitioners of these skills to further progress their profession. The development of the actuarial profession is a case in point. The major insurance companies, such as AMP, National Mutual and Colonial Mutual, fostered the growth of this profession. The actuaries employed by these organisations were instrumental in driving the professionalisation of this vocation and in the formation and development of its professional association (Bellis 1997; Blainey 1999).

Accountants were another profession that benefited from a close relationship with business. The expansion of colonial economies in the wake of the gold rushes was associated with an increase in the demand for business skills that went beyond that of functional bookkeeping. The introduction of regulations governing companies and the spread of the limited liability company reinforced the demand for higher-level skills such as auditing (Carnegie & Edwards 2001). By the end of the 19th century, professional associations had emerged.

The services provided by accountants expanded as the regulatory and legal framework governing the operation of businesses became more complex. The professional status of accountants grew as they were called on to undertake a wider range of tasks requiring a higher degree of specialised knowledge. While the skills of management accountants were in demand within the corporation, those of public accountants were also called for in an increasing capacity. Specialised accounting firms providing facilities to business expanded to become major entities as the demand for auditing and compliance services grew. During the 1960s and 1970s mergers between international accounting networks operating in Australia occurred, creating the 'Big Eight'.¹ The roles of these firms also extended beyond simple auditing services to include a range of business and professional functions.

Other professions also flourished as governments took a more active role in the regulatory environment. The legal profession developed as

¹ The 'Big Eight' became the 'Big Six' in 1989 and the 'Big Four' in 2001.

the interface between the state and corporations became more complex. Lawyers played an important role in translating new legislation and resolving issues surrounding new legal requirements. In adopting a number of roles in both the public and private sectors, they have facilitated the transmission of knowledge between legislators and the broader public (Lipartitor & Miranti 1998). Like accountants, lawyers built on the demand for their skills to establish their professional credentials. During the 20th century, the legal profession evolved from its basis of small family partnerships to become dominated by the large corporate law firms that have become an integral part of the modern business landscape. In the 19th century, the legal profession was largely made up of small partnerships or sole providers of legal services. In the larger urban centres such as Melbourne and Sydney, leading firms were very often family partnerships. A dynastic tradition evolved whereby only members of the family could become partners of these firms; non-family members were generally excluded. The basis of the business of these firms was built on long-established networks and connections with business leaders. The partners of these law firms provided the formal skills but the bulk of the legal work was undertaken by law clerks (Mendelsohn & Lippman 1979). Although this system started to break down in the 1920s, it was not until after World War I that the shift to the employment of non-family lawyers as partners began to gain momentum. During the 1950s and 1960s the model of business began to evolve in response to the growth of the economy and the corporate sector. Family firms that did not modernise lost their status as leaders in their field and a new organisational structure appeared. The expansion of the economy brought with it an increasing demand for new legal services, especially in the areas of taxation, securities and company law. The need for law firms to employ specialist legal advisers in these fields contributed to the changing structure of these organisations. The growth in the number of qualified legal practitioners within the firm led to the employment of the office manager to coordinate the activities of these professionals. Clerks were replaced by articled clerks working towards their professional qualification and the small family legal firm became increasingly less competitive. Mendelsohn and Lippman (1979) argue that the transformation of the character of the leading law firms that emerged was 'almost a mirror reflection' of the changes to the economy. As the style of business activity changed and became more complex with the expansion of multinational corporations and the growth of Australian companies, so too did the skills of the legal profession. The legal firms that emerged in the 1960s were the forerunners of the large corporate law firms in existence

today. These firms have now become international players, expanding into the Asia-Pacific region in the 2000s.

As economic transactions have become more complex, the need for specialised knowledge has increased. The various professions have supported this function and in doing so have matured to play an essential role in the business sector. The ability of lawyers, accountants, engineers and others to adapt and incorporate new knowledge in the services they provide has been a foundation block for the further development of the Australian economy and society.

Innovation

Magee (this volume) makes the point that the supply of technological ideas has embraced all sectors. However, the contribution of the service sector to innovation processes and the role service sector industries play in encouraging technological development have only recently become the focus of academic debate. Early analysis of the service sector suggested that service industries were characterised by low productivity and low levels of technology (Evangelista 2000). This view was challenged in the 1980s by empirical research that found many service industries were actively involved in innovation, especially through the introduction of ICT. Miles (2000) suggests that there are three broad conclusions that can be made about the role of services in fostering innovation. First, service industries play an important role as intermediaries in innovation systems. Second, service industries play a role as orchestrators of innovation across supply chains. Third, many service industries are not well linked into technologically innovative systems. Some services have less scope for innovation than others; child care, domestic services and personal services such as hairdressing require low levels of technology and practices haven't altered much in several decades (Standing Committee on Economics Finance and Public Administration 2007).

However, just because a service industry is not technologically driven does not mean that it is not innovative. New ways of delivering services in response to changing consumer tastes have transformed some services in the post-World War 2 period. The food outlet industry, for example, is very different to that of 40 years ago. The range of food styles available in restaurants has expanded to include a vast array of nationalities and dietary alternatives. The takeaway food business has developed beyond the corner fish and chip shop to encompass the range from multinational fast food chains to specialised niche market cuisine (DIISR 2009).

The provision of personal services has also been innovative in other ways. For example, outsourcing and the spread of franchising have corporatised services that were once provided on a small and limited scale. Microbusinesses have grown to become successful corporate enterprises through this process. The spread of franchises, such as 'Jim's Mowing', is a case in point (DIISR 2009).

At the other end of the spectrum, there are some service industries that are highly technologically driven. Broadberry and Ghoshal (2002) argue that the transition to modern business-enterprise structures in services would not have occurred without the ability to adopt new technologies. In particular, service industries that are dependent on the flow and management of information tend to be very technologically sophisticated. Financial intermediaries fall into this category. Insurance companies, for example, have not only needed to process large volumes of data, but also ensure its accuracy. Prior to World War 2 this was achieved with the aid of a complex system of data collection and verification that was very labour-intensive. The cost of maintaining this type of system in the postwar period drove the search for alternative methods of data management. The search for more efficient and accurate ways of processing information was almost an industry in itself. In 1949, insurance companies, such as AMP, acquired the latest Hollerith punched-card machines. These allowed the compilation of accounting and statistical data that had previously been too costly to produce (Keneley 2009). While this innovation radically altered back-office routines, it was replaced within a decade with the computer. The first commercially available computers were acquired by insurance companies from 1958 onwards. Shipped in pieces from the United States, they were assembled in purpose-built facilities, usually in the basement of head office. These innovations had far-reaching consequences for the operations of insurance firms. To be used effectively these machines required the centralisation of bookkeeping and record-keeping procedures. Fundamental changes in the organisational structure of insurance offices began to occur in the wake of this new technology. The centralisation of office functions encouraged reorganisation along functional lines and the branch system of management was replaced with a multidivisional structure. Specialisation within the organisational structure increased and new skills were developed. It was from this basis that insurance companies began to evolve into diversified financial intermediaries (Keneley 2009).

Similar experiences are also evident in the banking sector. Early technological advances, such as the telephone, typewriter and adding machine, were adopted quickly by banks. These inventions enabled them to conduct

their business more efficiently. Telephones facilitated communication between branches, allowing banks to maintain their branch networks. Typewriters and adding machines altered the pace of work and the skill levels required. One outcome was to encourage the employment of female clerks (Seltzer 2004).

Like insurance companies, banks had issues associated with managing large volumes of data. By the 1950s the banking business and its associated data-processing needs were growing rapidly. The cheque-clearing facility was a case in point. As a core function of the banking system it needed to work as efficiently as possible. The growth in the economy and associated demand and supply of cheques sparked the search for automated solutions to processing. The introduction of an electronic reading and recording device by the Bank of America in 1955 provided a solution to this problem (Batiz Lazo & Wardley 2007). From that point on the move to computerisation of back-office functions gained momentum, and accounting and record management procedures were progressively altered over the next two decades. However, the most sweeping changes to banking practice were to occur in respect to the services offered to bank customers. Starting with the introduction of credit cards in the 1970s, technological innovation allowed banks to extend retail services and offer new forms of intermediation. The spread of ATMs, telephone banking, EFTPOS and internet banking have changed the face of retail banking. Westpac introduced the first ATM in 1981 and EFTPOS two years later (Davidson & Salsbury 2005). Telephone banking was introduced by ANZ in 1985. Internet banking first appeared in the mid-1990s. Innovation in distribution channels has altered the ways in which banks operate and bank customers make use of bank facilities. This has changed the nature and role of the bank branch from that of bank-account management to product provider supplying retail customers with an array of financial products.

Technological innovation may also be facilitated by knowledge-intensive or professional services firms that provide the expertise necessary to assist organisations with the implementation of new methods of production. Business and management consultancy firms fall into this category. They emerged in Australia after World War 2 in response to the demands associated with the expansion of the mining and manufacturing sectors (Wright 2000). Initially, the focus of the management consultant revolved around industrial engineering and financial controls as new techniques of management accounting were increasingly adopted to monitor labour costs and productivity. By the late 1950s the facilities of consulting agencies were branching out into executive recruiting, personnel, management training and marketing. These firms

evolved to offer more sophisticated services in the 1960s. With the adoption of computer technologies, consultants became important providers of EDP advice. For example, a leading management consultancy at the time (P. A. Australia) developed one of the first integrated data management systems for ICI Plastics Australia in 1963 (Wright 2000). EDP services also became a focus for the large accounting firms that expanded into consulting services in the 1970s. Throughout the 1980s and 1990s management consultants continued to diversify, adding services such as strategic planning and corporate strategy to their repertoires. The consulting services industry has played a key role in promoting innovation through the dissemination of knowledge and providing solutions that encourage the adoption of emerging technologies.

While historically the service sector may have been assumed to lag behind in the uptake of new technology, it is clear now that this is not the case. Technology-producing services are an essential part of the innovation process and have encouraged the uptake of new technology throughout the economy.

Regulatory influences

Governments have traditionally played an important role in the service sector. Intervention was used to pursue a variety of economic and social objectives and it took different forms. Public provision of services was seen as a solution to situations in which the market was perceived to have failed. Utilities, transport infrastructure and telecommunications were examples of services owned and provided by governments at both the state and federal level. Regulatory devices were used to control market conduct to ensure equity in the distribution of particular services or protect Australian businesses. Broadcasting licences, banking controls and the two-airline policy are examples of regulatory systems that have influenced the provision of particular services. Government spending was also used to support the growth of services supplied by other organisations, principally from the not-for-profit sector. Community services was one area that expanded with the encouragement of government funding in support of the welfare state. Quiggin (1999) argues that Australia led the way in the public provision of social welfare services, post and telecommunications, roads and railways, public education and health services. What was seen as an advanced experiment in the 19th century was replicated in other western countries in the 20th century.

The last two decades of the 20th century witnessed a reversal of the mixed-economy approach to service provision. The election of the Thatcher government in the United Kingdom and its ensuing pursuit of a privatisation

agenda marked a dramatic shift in attitudes to the role of the state in the provision of services. In Australia, similar policies were adopted, with government-owned services sold off or corporatised. During the 1980s and 1990s the process of economic rationalisation gathered pace. Borland (this volume) traces the motivations for microeconomic reform in more detail. In respect to government support for services, the common theme was the adoption of a market-oriented approach to funding and service provision. This approach was characterised by the sale of government-owned services at both the federal and state level. Australia's privatisation program, which began in the early 1990s, was one of the largest in the OECD. Its focus was on enterprises providing services such as transport, communications, electricity and finance. At the federal level the sale of transport services (e.g. airlines, airports, rail and port facilities) and communications businesses (e.g. Telstra, Aussat, AeroSpace Technologies) was the most significant in the privatisation program. At the state level, banks, insurance offices and utilities dominated (RBA 1997). In conjunction with the sale of state-owned services, regulatory reform and the pressure to reduce reliance on government funding led to new approaches to service provision. This was particularly so in the areas of social services such as community services, health and education. The discourse revolved around the need to contain the cost of services and maximise efficiency of delivery. New frameworks of practice were introduced, such as contracting and tendering to private providers. The net effect of these changes has been to marketise services that had previously not been subject to market forces.

Changes in the regulatory environment surrounding service markets have also been associated with the liberalisation of trade and a lifting of barriers to trade in global markets. The trade in services has expanded accordingly to become a key component of international transactions. Since 1980, Australia's services exports have grown at an average annual rate that outpaces that of goods exports (ACCI 2011).

The traditional view of services was that they had essential characteristics that made them difficult to trade. Two key features were thought to contribute to their non-tradability. First, they were non-storable, meaning that they needed to be consumed in the same location at the same time. Second was their intangibility, meaning that it was difficult to monitor quality without close interaction between buyers and sellers (Miozzo & Soete 2001). Technological innovation has helped overcome these drawbacks. Advances in information technologies have increased transportability, allowing transactions to occur in different locations and different times. It has also reduced

the problem of information asymmetry and the need for a direct relationship between buyers and sellers to monitor quality (Miozzo & Soete 2001). Globalisation has further facilitated the trade in services by encouraging the integration of markets and generating increased demand for new types of services.

Key components of the trade in services are education and travel. These represented 63.2 per cent of exports in trade in 2009–10 (ACCI 2011). Education developed as a tradable service from the mid-1980s onwards. Prior to that it had been part of a subsidised program that grew out of the Colombo Plan. This plan, introduced in 1951, represented a cooperative agreement between the Australian government and emerging economies in Southeast Asia. The fostering of educational opportunities for students from these countries was one way in which this program could be supported. Rising costs led to a review of the educational subsidy program. The resulting change to policy in the 1980s that allowed for full-fee paying students created the foundation of the education export industry. Full-fee programs developed in tertiary institutions, secondary schools and technical colleges. A corollary to this was the spread of private educational organisations, such as English language schools and business colleges, which emerged to provide ancillary services supporting the expansion of tertiary education programs. The success of these programs saw earnings from the export of educational services grow rapidly in the 1990s (Meadows 2011). Since that time, the education industry has expanded to become the largest service export industry and the fourth largest export earner overall (ACCI 2011).

Although exports of services such as education and travel have grown, the trade in services in general has not diversified to the same extent as it has domestically. Table 17.3 indicates the relative significance of key services exports.

Of note is the business services share of total exports. While there has been a significant growth in the global trade for producer services, Australia has not shared in this expansion. The producer services share of exports has remained fairly static since the 1980s (BCA 2007). Australia has a well-developed service sector but it occupies a minor place in service-sector trade globally. This is particularly the case for producer services. O'Connor and Daniels (2001) suggest that particular issues in the home and host countries explain this state of play. They argue that, on the one hand, Australian companies have not matured to the stage where they can operate effectively in international markets for producer services. On the other hand, the trend in the services trade has been increasingly focused on the ASEAN region where the demand for producer services domestically has not fully developed.

Table 17.3 Australia's services exports, 2009–10

Services	Value (\$ billion)	Share of total (%)
Education-related services	16.4	32.6
Non-education-related travel	14.7	29.2
Professional and business services	6.9	13.7
Transport	6.2	12.3
ICT services	1.7	3.4
Financial services	1.0	2.0
Other services	3.4	6.8
Total services	50.3	100.0

Source: ABS (2013c), Table 1.9.

The alterations in the regulatory environment over the last two decades of the 20th century have had far-reaching implications for the service sector. Attitudes to service provision, frameworks of service delivery and expansion of services markets have altered in response to pressures for change. The service economy that is emerging in the 21st century will be very different to that of the previous century.

Conclusion

The service sector is an essential part of the Australian economy. In the 19th century, the expansion of agricultural and industrial activity encouraged the development of a variety of services to producers that formed the basis from which the current suite of services evolved. Urbanisation and the emergence of a middle class in the middle of that century were associated with growth of a range of other types of services. Transport, utilities, tourism and personal services, revolving around the demands of growing urban communities, added to the growing sophistication of the service sector. Employment and output measures point to the growing importance of the service sector throughout the 20th century. By the end of that century it accounted for three-quarters of the output and four-fifths of employment in the Australian economy.

Service-sector trends provide an understanding of factors influencing the maturation of the economy and the impact of changes in the organisation of industrial and business activity. The adoption of a multidivisional business model, for example, led to the outsourcing of many ancillary services. This provided an environment in which producer services could expand and

more readily adopt new technology. The progressive development of the retail sector, from the small shopkeeper in the early 1900s to the emergence of large retail stores in the 1920s, shopping malls in the 1950s and retail conglomerates in the early 2000s, provides an insight into the adaptive processes of change. The decline of the domestic servant and the rise of a wide range of personal services reflect the socioeconomic impact of increased workforce participation among women and the growth in two-income families.

The heterogeneous nature of services has made it difficult to develop an understanding of the true nature of the contribution of this sector. Early explanations of the pattern of growth suggest that supply and demand factors are key determinants influencing the development of the service sector. Since the 1970s a variety of new methods of classification have broadened our understanding of the linkages between the service sector and other sectors of the economy. It is now apparent that aggregated approaches to measuring productivity do not give a full picture of the impact of services on economic growth. It is also evident that the service sector is contributing a lot more to capacity building than the statistics would suggest. The link between service industries and professionalisation has provided the basis for higher-level activities that support economic growth. The professions have played a vital role in furthering knowledge systems. The ability of lawyers, accountants, engineers and others to incorporate new knowledge into the services they provide has been a key element in the growing sophistication of economic structures and institutions. Furthermore, the role of services in promoting innovation and technological development has been underestimated. While it is clear that not all types of services are technology producers, those that have contributed to innovations that have provided the platform for future economic growth.

The service sector is an integral part of Australia's economic landscape. Not only does it represent a major source of employment and value added, but it also contributes to economic development in a host of ways that are not always apparent. The growing sophistication of service industries in the first decade of the 21st century suggests that this sector will continue to provide the prerequisites for future growth and development.

PART 5



BUILDING THE MODERN ECONOMY

Reorientation of trade, investment and migration

RICHARD POMFRET

Introduction

This chapter will bring together some of the key geographic shifts in Australia's international economic relations in the second half of the 20th century, particularly the refocusing of investment, trade and migration towards East Asia. After describing the major elements of Australia's changing international economic relations, the chapter will examine the main explanatory factors and analyse the consequences of the shifts, which have primarily been increased material prosperity for most of Australia's population, a greater openness of the economy and society, and the adoption of multiculturalism.

Patterns

In 1950 farmers and graziers supplied 86 per cent of Australia's exports; by the 1990s that share had fallen below 25 per cent. Meanwhile, the share of fuels, minerals and metals, 6 per cent in 1950, rose to more than 40 per cent and the share of services increased from 5 per cent to 20 per cent. The change in structure was accompanied by an equally dramatic change in the direction of exports: the share of Europe (primarily the United Kingdom) dropped from 63 per cent to 16 per cent while that of East Asia increased from 14 per cent to 56 per cent (Anderson 1995, p. 33). These dramatic changes, which have continued into the 21st century, required a rethinking of Australian policy towards trade, investment and immigration, as well as reassessment of the nature of Australian society, with its European heritage and Pacific location.

Trade

A paradox of Australia's trade levels is that, like other settler economies, the country was from the time of the First Fleet in 1788 dependent on exports to pay for necessary imports, but trade levels have been low relative to GDP,

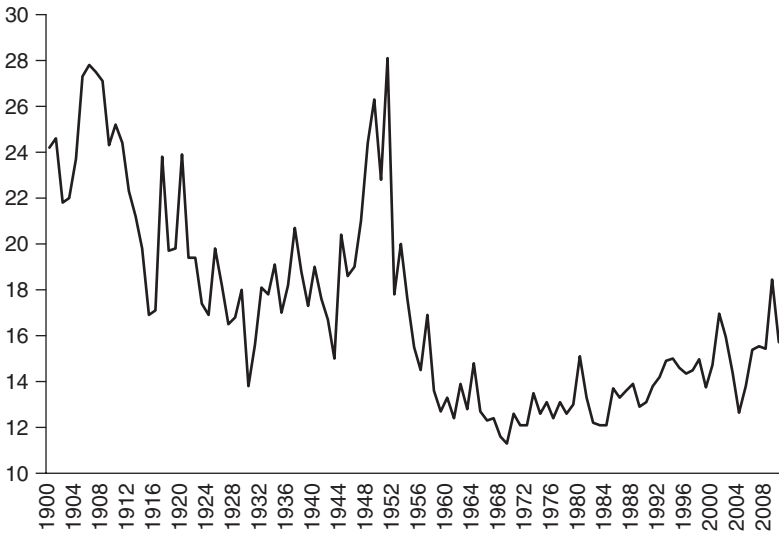


Figure 18.1 Australia's export ratio, 1900–2010 (exports of goods as a percentage of GDP)
Source: Dyster & Meredith (2012, p. 7).

especially in the second half of the 20th century (Figure 18.1). One reason for this was the historically high trade costs due to Australia's 'tyranny of distance' (Blainey 1966). Trade was also discouraged for most of the 20th century by high trade barriers; these were imposed on imports but also resulted from the ensuing overvalued exchange rate, which in turn acted as a disincentive to export.

Australia was a classic staple economy in the colonial era, exporting prison services, and wool, gold, grain and other primary products (Pomfret 1981; McLean 2013). Exports went primarily to the United Kingdom, and imports also came from there. These trade patterns continued throughout the first half of the 20th century. Wool exports peaked during the Korean War boom when Australia's terms of trade index (2010–11 = 100) soared from under 40 in 1947 to 100 in 1951, a level not regained until the 2011 mining boom (Figure 18.2). Australia's competitive position declined in the 1950s and 1960s as substitutes for wool became popular, although in the 1960s declining sales of Australia's traditional exports were offset by major mineral discoveries. In the early 21st century, the leading exports were iron ore, coal and gold, followed by education services.

Trade ratios have risen since the early 1980s, but are not high. The ratio of trade in goods and services to GDP at constant prices was almost stationary

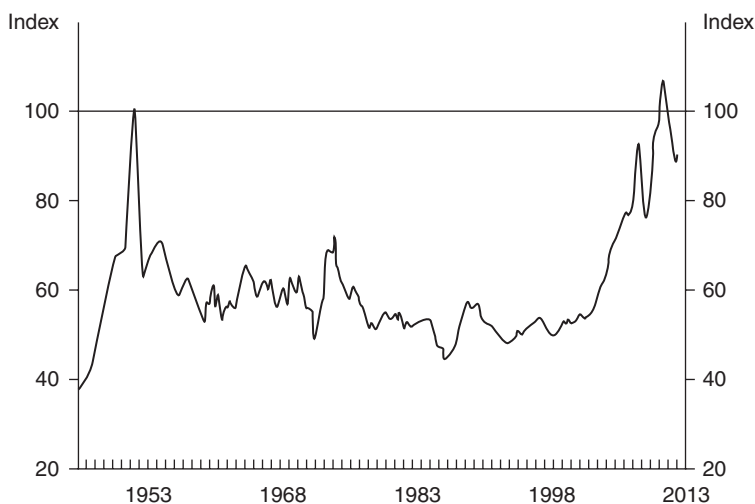


Figure 18.2 Terms of trade, 1947–2013

Note: Annual data are used prior to 1960.

Source: RBA (2013c).

between 1950 and 1980 at around a quarter, but after that rose rapidly to more than 40 per cent by the early 2000s. However, this last figure is low compared to 60 per cent for the United Kingdom and almost 80 per cent for New Zealand (Penn World Tables data, cited in Lloyd 2012). These statistics reflect the simple structure of Australia's export sector, which requires fewer imported inputs compared to an economy like Britain's, and the diversity of the domestic economy, which can produce a larger range of final goods compared to a small economy like New Zealand's.

In the early 21st century, Australia's terms of trade again improved dramatically, on the back of soaring world demand for energy and minerals (Figure 18.2). Australia also became an exporter of services, as tourism and education became major sources of export earnings. Keneley (this volume) describes the rapid expansion of education exports since the 1980s; by 2009–10 education became Australia's fourth biggest export, behind iron ore, coal and gold, and in that year it represented 35 per cent of service exports, while tourism accounted for 28 per cent. The mining companies and the schools and universities catered primarily to the high-performing Asian economies.

In the late 1940s half of Australia's imports came from the United Kingdom and 37 per cent of exports went there (and more than 20 per cent to other Western European countries). By the late 1960s Britain's share had fallen to

22 per cent of imports and 13 per cent of exports. During the same period Japan's share of Australia's imports and exports, which had been less than half of 1 per cent in 1950, increased to 11 per cent of imports and 22 per cent of exports (Anderson 1995). A further change in the direction of Australia's trade followed Britain's shift towards closer relations with its Western European neighbours, culminating in accession to the European Communities (forerunner of the European Union) in 1973 and discrimination against Australian farm exports, which had to seek new markets. Australia also began to reduce preferential treatment of British imports until such treatment was eliminated in the 1980s.

In the long run, however, the change in trade direction was driven by the rising share of East Asian countries in world markets and those countries' need for crucial primary-product imports that Australia was able to supply (coal, iron ore, and other minerals). Thus, while the United States, Canada and Europe worried about competition from Japan during the 1970s and 1980s, Australia benefited from the fast-growing Japanese market and had a positive bilateral trade balance with that country. Similarly, Australia benefited from the rise of South Korea and Taiwan in the 1980s, and then the growing importance of China. Even as Japan's economy stalled in the 1990s and 2000s, Australian exports to and imports from Asia continued to grow rapidly. By 2011–12 China was Australia's largest trade partner (DFAT 2012b); the five leading destinations for Australian exports were China (25 per cent), Japan (17 per cent), South Korea (8 per cent), India (6 per cent) and the United States (5 per cent), and the five top sources of Australian imports were China (15 per cent), United States (14 per cent), Japan (7 per cent), Singapore (6 per cent) and Germany (4 per cent).

Rates of protection

There is no consensus on how to quantify trade policy, but the time path of Australian policy is apparent with any measure. Australia adopted high-tariff policies soon after Federation, although until 1930 Australian tariffs were not exceptionally high. They were, for example, generally lower than United States tariffs, and Australian and Canadian trade policies were not dissimilar until the mid-1930s, when Canada like the United States began to unwind the high tariffs of the early 1930s, and undertook serious trade liberalisation after 1947 (Pomfret 2000). In 1947 Australia was a charter signatory of the GATT (forerunner of the WTO, established in 1995), but during the 1950s and 1960s it sought exclusion from the general reduction of tariffs by GATT signatories on the grounds that as a primary-product exporter it needed to nurture

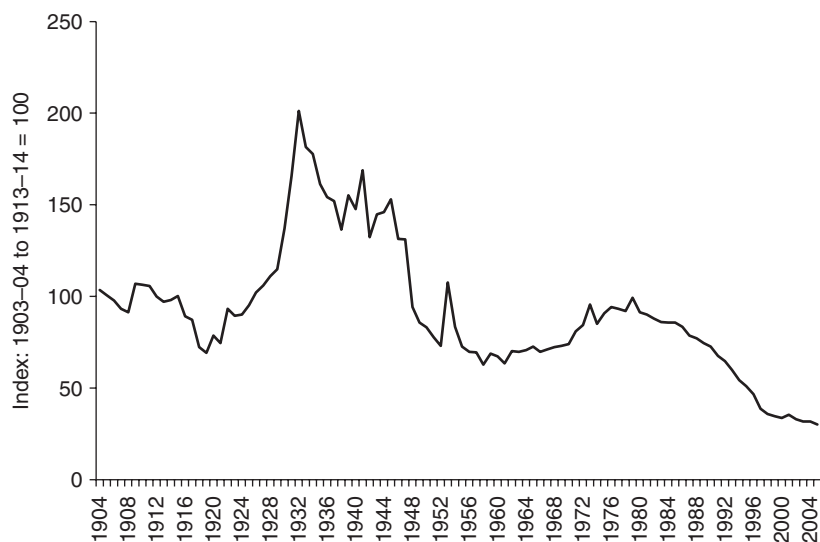


Figure 18.3 Level of tariff protection in Australia, 1903–04 to 2004–05

Source: Dyster and Meredith (2012, p. 20) based on Lloyd (2008).

infant industries. Australia's tariffs were reduced after they peaked in 1931–32, but this process slowed in the 1950s and apart from a reduction in 1973 was not resumed until the early 1980s (Figure 18.3).

A more complete measure of protection would include non-tariff barriers to trade as well as tariffs. Lloyd (2008) argues that the most meaningful measure of overall protection is the TRI, which is the uniform tariff rate that would yield the same utility as the actual differentiated structure of tariff and non-tariff barriers to trade. Unfortunately, the data required to estimate the TRI for Australia are only available since 1988. The estimated TRI fell dramatically from 16.9 per cent in 1988–89 to 5.9 per cent in 2004–05.

The more intuitively comprehensible import-weighted average tariff follows a similar pattern to the TRI, but with values about half the size – that is, from 8.3 per cent in 1988–89 to 3.5 per cent in 2004–05. Over the century before 2004, the average tariff was volatile (Lloyd 2008, Figure 10). It peaked at 37.1 per cent in 1931–32, fell to 8.2 per cent during World War 2 and increased to 16.0 per cent in 1945–46. It then fell to just under 10 per cent in 1956–57 where it stayed until the end of the 1960s, when it crept up to 13.2 per cent in 1972–73. A reduction to 10.4 per cent in 1973–74 was partially reversed, but after 1977 the average tariff remained in a range of 9–11 per cent until the late 1980s, when the sustained substantial reductions described above began.

By the start of the 21st century, Australia's protection of the importable goods sector was among the lowest in the world. The main residual protection is through non-tariff barriers, such as quarantine restrictions on agricultural imports or regulatory barriers, which apply especially to trade in services. The effective rate of protection – that is, the percentage by which a sector's value added is greater than it would be in the absence of any government intervention – is estimated by the Productivity Commission to have been 22 per cent in 1984–85 and 4 per cent in 2009–10. Assistance to the most protected sectors, TCF and cars, fell over this period from at least 250 per cent to 13 per cent for TCF and from 66 per cent to 11 per cent for cars (Industries Assistance Commission 1987, p. 64; Productivity Commission 2009, p. 19), although a succession of schemes was devised to help the car industry (see the Annex to this chapter).

Since the 1990s the main form of assistance to specific tradable goods sectors has been subsidies. During the 2000s the budgetary assistance has shifted from output-related assistance to subsidies for R&D and other general-purpose assistance. This is a major change in the nature of assistance (and one supported by economists as less distortionary) and in many cases it is now difficult to determine whether we are dealing with assistance to producers or, say, environmental policy (for example, in the case of subsidies for green technologies).

In the first half of the 20th century Australia was a strong supporter of the Imperial Preference system, but, as mentioned above, preferential treatment in the United Kingdom market was reversed in 1973. Apart from preferential market access for developing countries' exports under its 1966 Generalised System of Preferences scheme and a free trade agreement with New Zealand, which became more extensive with the implementation of the 1983 Closer Economic Relations Agreement (McLean 1995), Australia's trade policies in the late 20th century did not discriminate among trading partners. This changed after the turn of the century when Australia implemented trade agreements with Singapore (2003), the United States and Thailand (2005), Chile (2009) and ASEAN (2010). These agreements are with countries that, for the most part, have low tariffs, and they focus on reducing non-tariff barriers or behind-the-border regulatory measures that the partners believe inhibit trade.

The trade agreements' emphasis reflects a general phenomenon – namely that in an era of low tariffs, trade policy has become concerned with indirect influences on trade and may be inseparable from more general deregulation discussed in other chapters in this volume (especially Borland on

microeconomic efficiency, and Hatton and Withers on labour markets). Within the trade arena such policy initiatives are usually referred to as trade facilitation, or the reduction of trade costs other than tariffs and traditional non-tariff barriers. Historically, Australia was considered a high-trade-cost country due to the tyranny of distance and also to regulation (e.g. state monopolies in communications sectors) and uncompetitive labour markets (e.g. the workers on the militantly unionised docks).¹ Trade costs were reduced in the 1960s and 1970s by technical advances such as containerisation and the jet aircraft that were independent of Australian policies. In the 1990s and 2000s, public policy became more important with the deregulation of key services. It is difficult to quantify these changes, but one comprehensive study has estimated that Australia's trade costs fell from 8 per cent of the value of imports in 1990 to 4 per cent in 2008, which was higher than trade costs in the United States, about the same as in Brazil and lower than in Chile (Sourdin & Pomfret 2012).²

Exchange rates

The main macroeconomic variable affecting international economic relations is the exchange rate. For most of Australia's history, the currency's value was tied to that of the British pound. In 1910 a separate currency was introduced at par to sterling. In 1931 the Australian pound became equal to 16 British shillings. When Australia introduced decimal currency in 1966, with two dollars to the British pound, the new dollar's value was eight British shillings. During much of this period, the value of the Australian pound was supported by foreign exchange controls that were an important barrier to trade.

From 1946 to 1971, under the Bretton Woods system, Australia maintained a peg to the American dollar, and the Australian dollar decoupled from sterling when the pound was devalued in 1967 and the Australian dollar's value remained USD1.12. With the December 1971 Smithsonian Agreement and subsequent attempts to maintain the Bretton Woods system with a devalued US dollar, the Australian dollar appreciated from USD1.12 to USD1.22 in December 1971 and eventually USD1.49 in September 1973. Australia's peg against the United States dollar created volatility and depreciation against

1 Sheridan (1998) analyses the dysfunctional labour relations in the pre-containerisation waterfront industry.

2 Trade costs are defined as the difference between the costs of international and domestic trade, and are measured in this example by the difference between the value of a good when it left the exporting country (fob, i.e. free on board) and when it arrived in Australia (cif, i.e. including cost, insurance and freight) as a percentage of the fob import value.

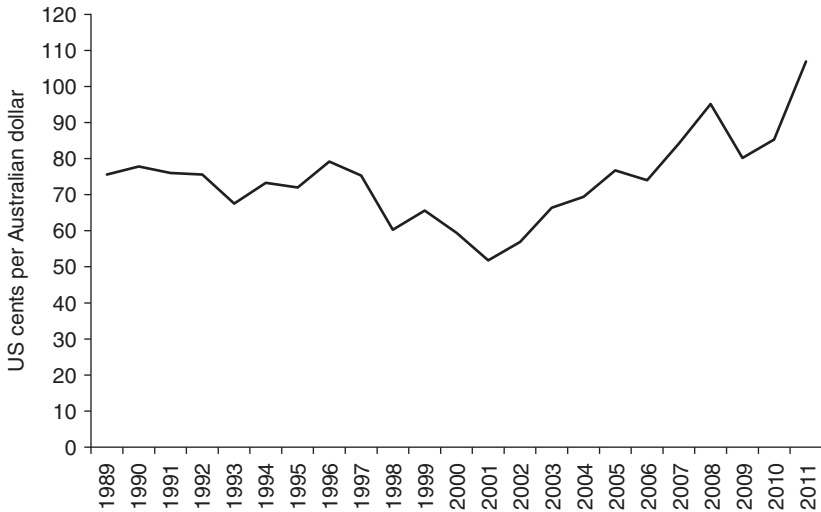


Figure 18.4 Australian dollar: exchange rate with USD, 1989–2011 (June)

Source: Dyster & Meredith (2012), p. 338.

other major currencies, and in September 1974 the Australian dollar's peg was shifted to a basket of currencies; the composition of the trade-weighted index was periodically adjusted after 1976. Policy reform between 1973 and 1983 was in response to external forces that exposed deficiencies in the prevailing system, rather than along a carefully planned path to greater flexibility (DeBelle & Plumb 2006), but the direction was towards the eventual abandonment of a fixed exchange rate and foreign exchange controls.

In December 1983 the Australian dollar was floated and virtually all exchange controls were removed. The dollar's value since 1983 has been determined primarily by market forces, and is volatile relative to other currencies. In large part associated with Australia's sensitivity to world prices for minerals and energy, the Australian dollar declined in value relative to the American dollar in the late 1990s, falling to almost 50 United States' cents in the early 2000s. The Australian dollar then went through a large and steady appreciation, broken only temporarily by the decline in world economic growth in 2008–09, and was worth more than a United States dollar by 2011 (Figure 18.4). This doubling in value of the Australian currency against the major international currency within a decade was a boon to Australians travelling abroad or buying imported goods, but placed a major strain on non-minerals exporters and on import-competing producers.

Inward and outward investment

There have been three distinct phases of foreign investment in Australia since 1945. Initially, foreign companies primarily from the United States and, to a lesser extent, the United Kingdom opened subsidiaries in Australia in order to jump behind the high tariff wall, and in the 1960s they were joined by mining companies attracted to Australia's natural resources. Between 1949 and 1970 the annual inflow of foreign direct investment increased from \$130 million to almost \$900 million (Krause 1984, pp. 299–304).

In 1972 a screening process was introduced to monitor foreign investment and limit takeover of Australian companies. The FIRB was established in 1975, and the screening process was tightened under successive governments. In 1983 the FIRB rejection rate doubled.

The third phase has seen a gradual relaxing of restrictions on foreign direct investment. This has been part of a more positive attitude globally towards direct foreign investment, reflected in the inclusion of TRIMs in GATT/WTO negotiating briefs in the mid-1990s and the inclusion of investment clauses in Australia's bilateral trade treaties in the 2000s. At the same time, some large firms of Australian origin (e.g. News Corp, Westfield, as well as older resource companies such as BHP and RTZ) were becoming major global players in their industries (Merrett, this volume).

Following the floating of the exchange rate in 1983 and the removal of residual exchange controls, portfolio investment flows have become important. The distinction is between foreign direct investment in which the overseas partner retains control of the project, assumes operating risk and receives profits, and portfolio investment in which the borrower controls use of the funds and the lender receives a contractual return (interest plus principal). As the relative importance of these two types of foreign investment changed, the interest rate became a determinant of the exchange rate, and Australia was impacted by changes in other countries' interest rates. In the 21st century this became significant in that Australia experienced an asset bubble in real estate markets before the United States financial crisis of 2007–08 and was at the same time part of a 'carry trade' because interest rates were higher than in Japan. Interest rates were higher in Australia because of the demand for funds driven in part by the real estate bubble, and the higher interest rates led Japanese investors who anticipated little change in exchange rates to 'carry' their funds to Australia in order to obtain a higher return. Capital flows based on shifting interest-rate differentials and including speculative positions on future interest and exchange rate movements added volatility to

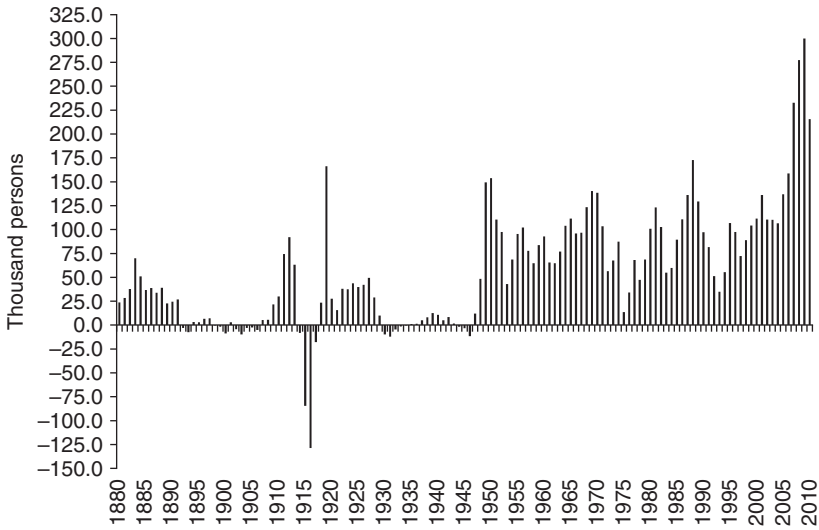


Figure 18.5 Net overseas migration to Australia, 1880–2010

Notes: Includes defence personnel, 1914–1920; to 1971 includes short-term movements.

Calendar years to 2006, then financial years ending 30 June.

Source: Dyster & Meredith (2012, p. 17).

the exchange rate, reflected most dramatically in the increased value of the Australian dollar in the first decade of the 21st century (Figure 18.4).

Migration

With its abundant natural resources, Australia has been a net importer of both capital and labour in almost every year since Federation, apart from during the two world wars and the Great Depression (Figure 18.5). Australia continues to be a land of immigration, although attitudes towards the level and composition of immigration have fluctuated. In the 2011 Census, 46 per cent of Australia's residents, out of a total population of 21.5 million, were either born overseas or had at least one parent born overseas.

Between 1946 and 1975 net immigration into Australia was more than 2 million people, of which around 1.75 million were publicly assisted (Figure 18.5). Apart from transport subsidies, the government provided assistance with finding employment, training in English and other skills, and temporary housing. Immigrants were predominantly British, although in the late 1940s there were also large numbers of displaced persons from northern Europe. By the 1960s the net was cast wider to include migrants

from southern Europe, especially Italy, Greece and Yugoslavia. With stagflation in the 1970s, immigration slowed and opposition to the idea that Australia needed more workers mounted. During this period, composition was determined by race as well as nationality; before the late 1960s, British or American citizens of non-European descent were not allowed to immigrate to Australia, and Asian or African emigrants were only considered in special circumstances.

In 1919 Prime Minister Hughes hailed the 'White Australia' policy as 'the greatest thing we have achieved'. After the outbreak of hostilities with Japan in 1941, Prime Minister John Curtin reinforced the philosophy of the White Australia policy, saying: 'This country shall remain forever the home of the descendants of those people who came here in peace in order to establish in the South Seas an outpost of the British race' (quoted in Department of Immigration and Border Protection 2009). During World War 2, however, many non-white refugees entered Australia. Most left voluntarily at the end of the war, but many had married Australians and wanted to stay. Minister Holt's decision in 1949 to allow 800 non-European refugees to stay, and Japanese war brides to be admitted, was the first step towards a non-discriminatory immigration policy.

The next major step was in 1957 when non-Europeans with 15 years' residence in Australia were allowed to become Australian citizens. The revised *Migration Act 1958* introduced a simpler system of entry permits, abolished the controversial dictation test, and avoided references to race. After a review of the non-European policy in March 1966, the Minister for Immigration, Hubert Opperman, announced applications for migration would be accepted from well-qualified people on the basis of their suitability as settlers, their ability to integrate readily and their possession of qualifications positively useful to Australia. This announcement was the watershed in abolishing the White Australia policy, and non-European migration began to increase. Yearly non-European settler arrivals rose from 746 in 1966 to 2696 in 1971, while yearly part-European settler arrivals rose from 1498 to 6054.³ In 1973 the Whitlam Labor government took three further steps in the process to remove race as a factor in Australia's immigration policies: legislating that all migrants, of whatever origin, be eligible to obtain citizenship after three years of permanent residence; issuing policy instructions to overseas posts to totally disregard race as a factor in the selection of migrants; and ratifying all international agreements relating to immigration and race. However,

3 ABS, 'Statistics – Migration', <http://www.abs.gov.au>.

the Whitlam government reduced the overall immigration intake, and an increase in the number and percentage of migrants from non-European countries only occurred after 1975.

The most dramatic event challenging immigration policy was the end of the Vietnam War in 1975 and the surge of refugees from Vietnam to whom Australia felt a moral obligation. Numbers were initially small, and Australian policy was accepting in part to encourage refugees to seek safer passage than in small rickety boats. In 1978, as large boats started to arrive, there was concern about whether the immigrants were refugees or economic immigrants. At the same time, however, Australia was coming under pressure from its ally the United States, which had taken the majority of Vietnamese emigrants in 1975–78, to accept a larger share, and during the Fraser governments Australia took in tens of thousands of refugees. Between 1976 and 1985, 73 000 Vietnamese settled in Australia, joining a community that had numbered less than a thousand in 1975.

While the numbers were small compared to total immigration, the episode began a period in which attitudes towards Asian-Australians would be transformed. In 1989 a second exogenous shock followed the Tiananmen massacre in Beijing when the government announced that the tens of thousands of Chinese students currently in Australia would be permitted to remain in the country. Immigrants were subsequently admitted from other Asian countries, and in the 1980s a third of immigrants were from the Philippines, China and Hong Kong, Malaysia and Indochina. The Asian share increased to more than 40 per cent in the 1990s.

Australia's current migration policy allows people from any country to apply to immigrate, regardless of their ethnicity, culture, religion or language, provided that they meet the criteria set out in law. Immigration rates have increased since the turn of the century, more than doubling between 2000 and 2012. While the United Kingdom and Ireland continue to be an important source of immigrants, their combined number was less than a sixth of the total inflow in 2011–12, when India and China were of roughly the same importance as the British Isles and most of the other immigrants were also from Asian countries (Table 18.1). In addition to Indigenous languages, around 200 other languages are spoken in Australia; after English, the most common languages spoken are Italian, Greek, Cantonese, Arabic and Mandarin.

As race was being removed as a criterion for immigration, Australia was moving to a more explicit focus on skills. Economists played an influential role in two 1988 reports that paved the way for this policy shift,

Table 18.1 Immigrants by nationality, top-10 source countries, 2011–12

Country of origin	Number
India	29 018
China	25 509
United Kingdom	25 274
Philippines	12 933
South Africa	7640
Sri Lanka	5577
Malaysia	5508
Ireland	4938
South Korea	4874
Vietnam	4773
Total	184 998

Notes: Period covered is 1 July 2011 to 30 June 2012. New Zealand is not included.

Source: Department of Immigration and Citizenship (2012), p. 5.

foreshadowing similar changes in other high-income countries.⁴ In the first decade of the 21st century, qualification levels of the Australian population increased dramatically (for example, the number of people with a postgraduate degree increased by more than half between the 2006 and 2011 censuses), and the fact that immigrants had higher levels of education than the resident population was an important factor in the upgrading of skill levels.

Explanations

Several mutually reinforcing reasons lay behind these changes. Britain's declining importance in the world economy, and in particular in the Asia-Pacific region, had been highlighted by the 1941–45 War in the Pacific. Although the immediate postwar decade saw reaffirmation of the old ties, this was clearly temporary; a situation highlighted by the United Kingdom's applications to

⁴ The two 1988 reports were the *Report of the Committee to Advise on Australia's Immigration Policies* chaired by Stephen Fitzgerald, and the *Report of the Expert Working Committee on the Immigration Selection System* to the National Population Council chaired by Glenn Withers.

join the European Common Market, albeit unsuccessful during the 1960s, but finally achieved in 1972. On the world's stage, the United States was the unchallenged dominant power in the global economy. Following increased assembly of vehicles for American troops during the war, the first Australian designed and commercially produced car to roll off the assembly line in 1948 was built by the American-owned General Motors–Holden. During the next two decades, investment by other United States corporations and import of American cultural exports raised concerns about the Americanisation of the economy and society.

The 1950s and 1960s were decades of historically rapid growth in the world economy, driven by trade liberalisation and exchange rate stability and by technical change, which reduced the costs of transport and communications. Australia was far from immune to these developments. However, the policy response was to resist change by maintaining, and in some respects strengthening, the protectionist trade policies and labour market regulation that had been set up in the first half of the century (Wilson, this volume; Pincus 1995; Merrett & Ville 2011). In the 1950s, protectionism was intensified by quantitative restrictions on imports, by foreign exchange controls and by specific state intervention in agricultural markets. Although a charter signatory of the 1947 GATT, Australia absented itself from the substantial trade liberalisation undertaken by the high-income countries of North America and Western Europe; by remaining a high-tariff country, Australia benefited less than other countries from the 25-year boom after the GATT was signed. Uniquely among the high-income countries, Australia's openness, measured by the ratio of exports plus imports to GDP, was lower in 1975 than in 1960. It could have been worse as world food and wool prices declined from their early 1950s peak, had Australia not been saved by the first large mineral discoveries of the 20th century which began to figure significantly in exports by the end of the 1960s.

Although not clearly recognised until the 1970s, another major change in the world economy was the growth of the newly industrialising economies of East Asia. By the end of the 1960s the rapidly growing Japanese economy was buying more than a quarter of Australian exports,⁵ and developing East Asia a sixth. In the short term, Australia could export raw materials to the region, balancing the widening trade deficit of Europe and North America with East Asia, but in the long term Australia's restrictions on imports were

5 Australia, in contrast to New Zealand, made an effort to reorient trade from the United Kingdom. Schedvin (2008a) documents the attempts during the 1950s to find markets for Australian wheat in Asia as a way of avoiding more fundamental trade reforms.

increasingly anomalous. As Australian exporters opened up to the global economy and overseas travel became easier with the development of more efficient longer-range jet aircraft, Australians became aware of the shortcomings of domestic products.

The catalysts for economic reform in Australia are a matter of dispute. A conventional account emphasises the role of academics and public servants, notably Alf Rattigan, in pushing the reform agenda with eventual success (Corden 1997, pp. 109–28). The influence of professional economists is difficult to assess because such influence might be indirect and gradual rather than identified with a specific person. From the 1960s, however, there was a clear trend towards better economics education and more economics students in Australian universities, and subsequently an increased role of trained economists in government and elsewhere. Sceptics, such as Brennan and Pincus (2002a), argue that ‘it is doubtful whether economists’ views played more than a peripheral role’ and that the international climate set by leaders such as Margaret Thatcher in Britain and Ronald Reagan in the United States was more important, with Australian politicians as followers rather than path-breaking reformers. Whether influenced by economists’ arguments, and Max Corden with his international reputation was especially significant, or by atheoretical observation, Australian policy reform was surely in response to the evidence that failure to specialise and realise potential gains from trade was harming the country.

Economic reform was not easy. The first reform efforts were made in the mid-1970s, but serious change only came in 1983. The Whitlam government introduced an across-the-board 25 per cent reduction in import duties in 1975. Under the 1975–83 Fraser governments an inquiry into the functioning of the monetary system (the Campbell Commission) was established, and reported in 1981, but Fraser and other senior ministers were lukewarm towards foreign exchange deregulation, and there was strong resistance in the bureaucracy, especially from Secretary of the Treasury John Stone. Besides the caution on the part of politicians and senior public servants, there were also powerful interest groups that would be hurt by reduction in protection from foreign goods.

Despite rejecting the recommendations of the Campbell Commission, once in power the Hawke–Keating Labor governments pursued radical reforms, starting with the decision to float the currency in December 1983. Adoption of a flexible exchange rate was explicitly linked to controlling inflation and increasing Australia’s international competitiveness. Liberalisation of the foreign exchange market highlighted the need for major regulatory

reforms, as described elsewhere in this volume (Borland, Keating). Between May 1988 and March 1991 the government initiated a fairly rapid reduction of trade barriers, aimed at reducing most tariffs to less than 5 per cent by 2000. Despite the economic hardships caused by reforms in the decade after 1983, the reform agenda was largely bipartisan, although momentum slowed after the turn of the century.

Trade liberalisation occurred fairly smoothly, apart from two sectors that had been heavily protected and were allowed ongoing assistance. TCF claimed special needs due to the industry's salience in country towns, and the claim was to some extent underpinned by the existence of the Multifibre Arrangement, an international agreement which permitted GATT/WTO members to impose quotas on textiles and clothing imports from low-wage countries. The Whitlam government had partly offset the impact of its 1975 tariff reductions by tightening quantitative restrictions on textile and clothing imports, but the scheduled expiration of the Multifibre Arrangement at the end of 2004 provided a useful termination date for special protection of the Australian industry. The car industry was more complex due to the dominance of a handful of multinational corporations (initially Ford, GM and Chrysler, but by the 1990s Chrysler had left and Toyota and Mitsubishi had arrived), and the geographical concentration of jobs around a few large factories. The late 1980s and 1990s were characterised by a series of 'plans' for the car industry of varying degrees of complexity (see Annex, p. 415). Nevertheless, even these exceptions were limited and by the early 21st century the Australian economy had become one of the most open to trade. The main residual restrictions are non-tariff barriers, such as quarantine restrictions on some imported foods and goods banned in Australia (narcotics, pornography, guns, etc.).⁶

With the increased openness of the Australian economy, the reorientation of trade towards Asia accelerated as Australia proved perfectly placed to take advantage of East Asia's high economic growth. Recognition of the new industrialising economies of Asia (the Four Tigers: Hong Kong, Singapore, Taiwan and South Korea) came in the mid-1970s, and the second generation (Malaysia, Indonesia and Thailand) reformed in the early 1980s, coinciding with China's reengagement in the global economy after its 1979 reforms. Although Australian trade patterns had been shifting towards Asia since the

6 Thus, importers continue to face time costs of clearing customs, quarantine and other regulatory barriers not faced by domestic producers. However, competing domestic producers and retailers have become increasingly vociferous about the amount of imported goods avoiding taxes on goods and services.

1950s, there had been little active engagement in the region beyond supporting the United States' military involvement in Vietnam. Protests against that war and against Australian inaction during the Indonesian takeover of East Timor in 1975 contributed to a reassessment, while the Vietnamese boat people stimulated migration policy change. The economic opportunity was publicised by Ross Garnaut (1989), an economist and Australian ambassador to China, and reflected in Australian leadership establishing APEC in 1989.

Migration patterns also shifted as immigration from Europe slowed, and new Australians came increasingly from Asia. Formal abolition of the White Australia policy was a precondition, but external stimuli were also important. Immigration has largely been a bipartisan policy, although the Liberal opposition in the late 1980s voiced more open reservations to non-European immigration and there have been ongoing concerns about queue-jumping migrants posing as refugees.

Consequences

In the last decade of the 20th century and the first decade of the 21st century Australia had one of the fastest rates of economic growth among mature economies. Australians enjoyed not only more goods and services but also vastly more choice, epitomised in the diversity of cars on the streets as protection for domestic producers was removed. Valid concerns were voiced about the distribution of benefits, and there were clearly short-term gainers and losers from policy reform, but (apart from socially excluded groups marginalised from the market economy) increased inequality was not as apparent or divisive as in the United States or Europe (Shanahan, this volume).

Adjustment across sectors was facilitated by macroeconomic stability after the tariff cuts were introduced. Following the recession of 1992, Australia enjoyed more or less full employment over the next decade and a half. Microeconomic reform facilitated labour mobility, while reasonably comprehensive unemployment insurance softened the short-term blow of job loss. Indeed, one striking feature of the economy after the turn of the century was increased acceptance, at least outside the public sector, that the concept of a job for life was anachronistic in a modern economy.

Reorientation of trade, investment and migration flows not only weakened the old imperial ties, but forced Australians to face up to the challenge of dealing with new types of organisations in partners with different cultures. This began to happen in the middle decades of the 20th century as Japan became a major customer for Australian wool, and large Japanese

companies exported and then invested in Australia. The rise of China to become Australia's leading trade partner posed even greater challenges as entrepreneurs operating within institutions with a variety of state involvement all had attitudes shaped by China's tumultuous 20th-century history and rapid change over recent decades, a background difficult for most Australians to comprehend. Nevertheless, the challenge has to some extent been met successfully as Australian exporters, whether in resource sectors or in services, have found customers in East Asia.

The post-1983 reform package created a more flexible Australian economy in which competitive firms or sectors, which would not have been identified as major exporters by policymakers, have emerged. Ironically, some of the niche exporters have been in the sectors that were most fearful of import competition – TCF and transport equipment. Billabong, founded in 1973 by a Gold Coast couple who designed board shorts and cut them on the kitchen table, went international in the 1980s and became a public company in 2000; the global clothing company had sales of \$1.7 billion in 2011. In the transport equipment sector an Australian company is the sole source of the wholly composite rudder for the Boeing 777 and is designing and building the moveable trailing edges on the world's most advanced new aircraft, the Boeing 787.⁷ In diversifying from the stereotype of a farm on top of a mine, the most successful export sector has been education.

Economic liberalisation in Australia and New Zealand was accompanied by deeper trans-Tasman integration through the 1982 CER Agreement. East Asia's increased weight in Australian trade led to greater foreign policy emphasis on Asia, and a leadership role in the creation of APEC, which was both innovative (open regionalism) and defensive (countering the EAEC). Internal deregulation and increasing competitiveness led to new exports, notably of education services, which have attracted temporary (and sometimes permanent) immigrants, and will have long-run consequences as future Asian businesspeople, voters and leaders will (hopefully) cherish their Australian connections. As an open economy, and the 14th largest trading nation, Australia became more active on the global stage, through the Cairns Group in GATT/WTO negotiations (Higgott & Cooper 1990), and in the

7 Boeing Aerostructures Australia, established in 2000 by acquisition has moved from design, manufacture and assembly of aircraft to being a world-class manufacturer of aircraft components for leading manufacturers, and is highly regarded for its work in the area of advanced composite carbon fibre technology. Boeing Aerostructures Australia also works with a large number of smaller Australian companies, creating jobs and enabling development of new skills.

twenty-first century in the G20 and bidding for a seat on the UN Security Council. Some of the consequences have become part of the causal mechanisms, accelerating the reorientation of Australian trade, investment and migration towards Asia.

Economic changes have impinged on the nature of society. The old anglo-centric culture was challenged by immigration from southern Europe in the late 1950s and 1960s. However, the White Australia migration policy was not dismantled until after the 1966 Migration Act and further reforms in the 1970s, and large-scale Asian immigration followed shocks overseas between 1975 and 1989. The consequence in the 1990s and early 21st century was a visible shift to multiculturalism in Australia's cities.

Such changes have not been without difficult side effects. With exposure to globalisation, job security has declined and greater affluence has become associated with financial insecurity. These effects are not felt equally, as public-sector workers continue to benefit from greater job security and better pension rights than most private-sector workers, and as some high-profile Australians in mining, media and property have become very rich (Leigh 2013). The resource boom widened disparities between the states' economic prosperity, raising concerns about a two-speed economy as the 'rustbelt' south-eastern states fell behind flourishing Western Australia and Queensland, but rust is not a major problem in the Australia climate and this was a relative, not absolute, decline. Similar concerns were raised about the decline of country towns that failed to compete in a global economy. For many Australians the response was internal migration, although this was not always welcomed, and especially for Indigenous Australians urbanisation could be a traumatic experience. While immigration and multiculturalism have become widely accepted, treatment of refugees has become increasingly controversial. With more widespread worries and insecurities, consensus and civility in Australian domestic politics have declined in the 21st century, at the same time as the government of the day has assumed a role on the global stage in keeping with the country's greater involvement in the global economy.

ANNEX: the car industry

In the 1950s and 1960s, the Australian automobile industry expanded dramatically, with wholly owned foreign subsidiaries General Motors–Holden, Ford and Chrysler making large investments aimed at supplying the Australian market. Exports to New Zealand and other Commonwealth countries were

negligible. Smaller, local assemblers included Renault, Volkswagen and British Leyland. Political support for protection of the Australian automotive industry was largely bipartisan, until the Whitlam government's 25 per cent across-the-board tariff reduction in 1973. Holden immediately announced 5000 sackings, and the ACTU leader Bob Hawke led the industry-union campaign against the cuts. The result was an 85 per cent local content requirement and an agreement that Holden would rehire the retrenched workers. Over the next 30 years, tariff cuts were at least partly offset by subsidies or non-tariff barriers to trade, and whenever support fell short the foreign owners threatened to leave.

Despite protection, poor productivity led to Australian automobile industry crises in the 1980s. Holden closed Pagewood (New South Wales) and Acacia Ridge (Queensland), while Chrysler sold its remaining equity to Mitsubishi, including its Tonsley Park (South Australia) plant, in 1980. Meanwhile, the smaller European assembly operations had been discontinued, and Toyota and Nissan had established factories in Australia.

Starting in 1981 under the Fraser government and extended by John Button, the Minister of Industry and Commerce in the Hawke government, a gradualist approach to reductions in protection was accompanied by corporatist policies and ongoing subsidies. Button envisaged bureaucratic regulation (establishing the Automotive Industry Authority), phased tariff reductions (2.5 per cent per annum), export credits schemes, minimum annual model production (40 000 vehicles per model), joint ventures, model sharing and R&D cost sharing, which would together result in fewer separate car manufacturing facilities in Australia. Subsidies from Canberra helped Ford and Holden finance development of new Falcon and Commodore models in the late 1980s. Industry rationalisation led to plant closures as Nissan withdrew from Australian manufacturing in 1992 and Ford closed its Homebush (New South Wales) plant in 1994. At the same time, Toyota Australia made a \$500 million investment commitment in 1992, which was dependent on the government authorising Australia's first single union agreement – without which, Toyota threatened to build the plant in Malaysia.

Since the early 1990s, the car industry has been forced to adapt as successive governments have progressively reduced tariff rates to make the industry more internationally competitive and outward-looking. At the same time, however, governments introduced and increased subsidies to offset any loss by the industry with each successive tariff cut. These included, for example, a scheme in the 1990s to promote exports to the United States by

allowing producers to import an equal number of cars; Australian consumers paid extra due to the tariff, and the foreign-owned carmakers used the revenues to subsidise exports and increase profits. The leading export, the Ford Capri, was a beautiful car, but even with the subsidy was uncompetitive due to shoddy fit and finish, which reflected decades of the car industry being sheltered from international competition. The government has also imposed Australian-specific standards that lock out competitor imports without expensive adjustment. State and federal governments have preferential Australia-made car-purchasing arrangements that provide an indirect subsidy and demand for vehicles.

The combination of general support plus company- or even factory-specific assistance has continued to characterise Australian policy towards the car industry, whose producers routinely threaten to cut jobs if they are not subsidised. When in the 1993 election Liberal Party leader John Hewson proposed a zero-tariff regime and no specific industry support, the Federated Chamber of Automobile Industries (FCAI) campaigned actively, painting a picture of Dandenong, Altona, Broadmeadows, Fishermans Bend and Geelong (Victoria) and Elizabeth (South Australia) becoming ghost towns like Homebush (until resuscitated by the 2000 Olympics) and Acacia Ridge, and contributing to Hewson's defeat as he lost votes in those areas of Victoria and South Australia. Since then, there has been a bipartisan policy of offering support to the car industry, both at the Commonwealth level and in Victoria and South Australia. In 2012 the Gillard government committed \$5.4 billion to help the sector until 2020, and the Liberal government in Victoria and Labor government in South Australia also committed tens of millions of dollars on the promise that it will 'protect jobs'.

Yet fewer and fewer consumers wanted the cars that were made in Australia. Between 2003 and 2010, annual car sales in Australia were around 600 000, and the share of imported cars purchased by Australians increased from 60 per cent to nearly 85 per cent. Price-sensitive consumers were buying smaller, fuel-efficient cars, while domestic manufacturers continued to focus on larger cars, and consumers wanting quality cars have preferred imports ever since trade barriers were lowered. Subsidies insulated the local industry from the realities of the marketplace, and the industry did not build cars people want, but producers survived on subsidies; for example, in 2011 GM Holden (as the company was known by then) reported a profit which was almost exactly the amount that it collected in subsidies.

The situation was, however, unstable as losses increased and governments' appetite for subsidies approached a limit. After losing \$430 million in 2011 and

2012,⁸ Ford announced in 2013 that it would cease production in Australia in 2016, despite an offer by the Minister for Industry, Ian Macfarlane, to negotiate further subsidies. GM Holden looked increasingly desperate in demanding more subsidies from the government and wage cuts from its workers, and by the end of 2013 it too announced that it would cease production. In February 2014 the sole remaining car producer, Toyota, announced that it also would end car production in Australia by 2017.

8 'Holden posts second biggest financial loss at \$152.8 million, promises return', 8 May 2013, news.com.au, accessed 21 March 2014.

Microeconomic reform

JEFF BORLAND

Introduction

Over the past 30 years governments in Australia introduced a set of policies that have come to be known as ‘microeconomic reform’. These policies shared a defining characteristic: the intention to enable individual agency and markets to play greater roles in economic activity. The extensive scope and scale of the policies made microeconomic reform a (perhaps the) major theme of economic policy making in Australia during this time. Reform encompassed many areas of economic activity – finance, manufacturing, the government sector, and markets for agriculture, communications, utilities and labour – and a wide variety of policy changes, including removing barriers to entry to markets, ending price supports and subsidies to producers, and selling off government-owned business enterprises.

The main underlying motivations for undertaking microeconomic reform have been twofold: improving economic flexibility so as to assist in achieving macroeconomic balance and to help in raising living standards in Australia. Linking the policy to these objectives is the belief that allowing a greater share of economic activity to occur in the private sector with less intervention by government will improve resilience and productivity. Examples of ways in which it was expected this could occur were by inducing producers to supply their outputs more efficiently, and by improving or expanding the functioning of markets (Forsyth 1992, pp. 5–7; Freebairn 1998, p. 49).

That microeconomic reform constituted a broad and coherent episode of policy making has only gradually become apparent. When the federal government initiated reform of the finance sector in the early 1980s, it was a one-off rather than part of a master plan. But as the 1980s progressed, and the government developed a grand narrative for the problems facing the Australian economy and the potential benefits of reform, an extensive program of linked policy changes was implemented. As Peter Forsyth (1992,

p. 8) has noted: 'What started out as some ad hoc policies directed towards particular sectors has become a systematic program of measures.'

The chapter is organised as follows. The next section provides an overview of main reforms and rationales. Forming the bulk of the chapter, eight sections each describe a major area of reform, and evidence on specific effects of that reform, roughly in the sequence that the reforms occurred. The final section of the chapter presents an overall assessment of the effects of micro-economic reform.

Background

The story of government intervention in the Australian economy in the 30 years after World War 2 has been described as 'All the restrictive practices known to man' (Butlin, Barnard & Pincus 1982). Policy making, during and after the war, became increasingly centralised; and the influence of government policy on economic activity grew. Government intervention was designed to contribute to the national objectives of economic development and population growth, and to enable government to provide a social safety net for the less well-off.

Dating when economic policy making in Australia began to shift away from this model is difficult. Piecemeal changes to the competition, tariff and financial policies were made beginning in the 1960s. Probably the most reasonable starting date for microeconomic reform, however, is the conduct of the Campbell Committee review into Australia's financial system and the implementation of its recommendations in the early to mid-1980s. Later in the 1980s the federal Labor government turned to a program of wide-ranging structural reform (see Forsyth 1992, pp. 8–9; Henderson 1995, pp. 62–71). Its May 1998 Economic Statement announced a number of policy changes, such as reducing company tax, establishing a plan for cutting tariff protection, and placing government business enterprises on a more commercial footing (Kelly 1992, pp. 386–95). Regulation of agricultural commodity markets was challenged from the late 1980s onwards; privatisations of government business enterprises began to occur in the early 1990s; and reform of labour market institutions commenced in the early to mid-1990s (Hatton and Withers, this volume), as did the Hilmer reforms of competition policy. This chapter's review of policy reforms ends in the late 1990s, by which time the pace of microeconomic reform had slowed (Megalogenis 2012, p. 288).

Microeconomic reform has encompassed policy changes by governments at the federal and state levels. This chapter is mostly concerned with reforms

by the federal government. State governments have also played an important role, in those areas where they have responsibility for regulation. Privatisation of state government-owned enterprises (e.g. electricity generation and distribution in Victoria), reform of state industrial relations systems (Productivity Commission 1996, p. 39), and cooperation among states to achieve reform of the transport and utilities sectors (Keating & Wanna 2000, pp. 135–36, 140) are some examples of major reforms implemented by state governments.

Microeconomic reform required politicians to decide that it was a good idea. This happened when they came to believe that reform would bring significant national benefit and, furthermore, that the political gains accruing from the national benefit outweighed the political costs of losses that reform would cause for some private interests. Creating the position that reform would bring benefits depended, importantly, on the work of policy agencies (such as the Tariff Board), the government bureaucracy, and academic economists. The decision to act on this position was prompted by the perceived weak performance of the Australian economy in the 1970s and 1980s. Once initial reforms had been made, there was often a snowball effect, whereby the benefits of further reform were increased by the initial reform.

That the poor performance of the Australian economy was a powerful motivation for microeconomic reform now seems generally accepted in historical accounts (Forsyth 1992, p. 4; Kelly 1992, pp. 11, 14; Banks 2010, p. 4). In the 1960s and 1970s concerns were expressed about the impact of policy in specific areas, such as manufacturing industry, the labour market and the finance sector. In the 1980s these concerns coalesced into a general anxiety about Australia's loss of international competitiveness and its effect on living standards (Gruen 1986). Australia's external imbalance was rolled into the prevailing sense of doom, most famously in Paul Keating's 1986 'banana republic' statement (Megalogenis 2012, p. 184).

The idea that Australia's economic performance was poor, and that microeconomic policy reform was needed to rectify this situation, was increasingly taken up in the 1970s and 1980s by academics, government advisory bodies and politicians (see, for example, Quiggin 1996, p. 3 who also provides extra references). Independent public agencies, in particular the Productivity Commission and its earlier manifestations, were particularly influential in promoting and prompting microeconomic policy reform (Banks 2010, pp. 12–16; Brennan & Pincus 2002b, p. 26). Research by academic economists was an input to this work of policy agencies, as well as being an independent influence on opinions on microeconomic reform in Australia. Essentially, this research was important in describing why current policies might not be

in the national interest. This was done by identifying the ‘private interest’ motivation for many existing policies (e.g. Corden 1974; Sieper 1982), and by evaluating the benefits that would come from policy reforms (an early example was Kasper et al. 1980, p. 248). When academic economists moved into government bureaucracies, they served as a further conduit for research to affect policy making.

Some in fact have seen the role of economists as the main driver of microeconomic reform in Australia and interpreted this as dooming the reform agenda to failure. In a major public debate in the early 1990s, Michael Pusey (1993, p. 17) argued that ‘the central coordinating Departments have been captured by this single line of “new right” “free-market” economic rationalism’. Economists themselves have been more modest about their influence, citing many other factors affecting policy outcomes in Australia (e.g. Keating 1993) and rejecting the idea that the details of the microeconomic reform agenda represented slavish adoption of a greater role for markets (e.g. Harper & Leslie 1992, p. 89).

Political economy has a major role in most accounts of the introduction of microeconomic reform in the 1980s and early 1990s. In particular, several factors assisted the federal Labor government of this period to introduce reforms (Kelly 2000, pp. 223–34; Garnaut 1994). First, the government, through its corporatist approach, was able to garner support from business and the union movement, which was important for gaining consensus in favour of many reforms. Second, the Opposition supported passage of most reform policies in parliament, a critical factor. Third, policy was often deliberately crafted to ensure community support. Garnaut (2001, p. 3) suggests of this period: ‘It has always been necessary to demonstrate at least that a set of economic policies that raise output in the society as a whole does not exacerbate inequality in the distribution of income and wealth.’ Finally, Bob Hawke and Paul Keating, as Prime Minister and Treasurer respectively, brought a high quality of political salesmanship to the task of selling the reforms. Once started, the process of microeconomic reform to some degree generated its own momentum. Changes to government policy relating to one sector of the economy created an increased awareness of the benefits of microeconomic reform generally. In some instances an initial change in policy appears to have raised the returns to reform in another sector. As an example, making the Australian economy more open to international trade in the late 1980s and early 1990s accentuated the relation between economic performance and the degree of centralisation in wage bargaining, creating a greater reason for a shift to enterprise bargaining (Keating & Dixon 1989, p. xi).

Australia's move into microeconomic reform coincided with international rethinking of the role of government in the economy. Episodes beginning with the apparent inability of Keynesian demand management policies to deal with stagflation in industrialised economies in the mid-1970s through to the breakdown of communist economic systems in China and the Soviet Union were important in initiating this rethinking. The writings of economists such as Milton Friedman and Friedrich Von Hayek provided intellectual underpinnings. Both the Reagan administration in the United States and the Thatcher government in Britain engaged in market deregulation and privatisation of government enterprises in the early 1980s (Quiggin 1996, pp. 11–12), and closer to home New Zealand undertook large-scale reform from 1984 onwards (Evans et al. 1996). So it can hardly be argued that Australia was going it alone on microeconomic reform. International developments meant that, in adopting microeconomic reform, the Australian government could see itself as being in step with international practice. Beyond this, the developments likely provided guidance on how Australia should proceed with its own reform (Brennan & Pincus 2002b, pp. 22–4).

At the same time, it is important to differentiate the Australian and international experiences, with at least three areas of difference clear. First, the reforms in Australia were extensive by comparison with most other developed economies. Partly this was because by the 1980s Australia had fallen behind other nations in the process of policy reform. For example, Pincus (1995, p. 70) notes how Australia had remained aloof from the 'American-led thrust towards a more liberal world trade regime' from the 1940s to the 1960s; and in the aftermath of the breakdown of the Bretton Woods Agreement Australia was slow to shift to a flexible exchange rate. Second, Australia was distinguished from other major reformers, such as New Zealand, by its gradualist approach. Third, the context for reform differed. Australia had different institutions and economic circumstances, and a Labor government in office when reform commenced.

Finance sector

Regulation of the banking sector in Australia in the post-World War 2 era emphasised direct intervention – ceilings on interest rates and controls on bank lending (Merrett 1992). Problems with this regulatory system began to be recognised as early as the 1950s (Grenville 1993, p. 11) and, as a result, from the late 1960s onwards a process of removing some direct controls on banking activity commenced. At first this reform was faltering, with initial steps

being reversed; but in the years that followed the process accelerated, most notably following the Campbell and Martin reviews of the early 1980s.

In seeking to explain these reforms in the finance sector, accounts typically give precedence to the 'steady erosion of the effectiveness of monetary policy' that became particularly evident in the 1970s (e.g. Harper 1986, pp. 42–3). This decrease in effectiveness was mainly due to the growth of NBFIs. Because NBFIs were outside the set of regulations affecting bank activity, their growth meant that the central bank and the government were exercising control over 'a diminishing portion of total financial intermediation' (Grenville 1993, p. 7). Other factors were also important in explaining the impetus to reform. The breakdown of the Bretton Woods Agreement in the early 1970s and the subsequent growth in international capital flows made it increasingly difficult for Australia to manage and maintain its fixed exchange rate (Megalogenis 2012, p. 153). The organisation of the finance sector was seen as imposing efficiency losses on Australian society through, for example, the deadweight costs of interest-rate regulations and the effects of low levels of competition (Merrett 1992, p. 59).

The Campbell Committee was created in 1979 and reported in 1981 (see Committee of Inquiry into the Australian Financial System 1981; also Perkins 1982). Some of the Committee's recommendations were implemented by the incumbent federal Liberal–National Party government. In 1983 the new federal Labor government established the Martin Committee to review the Campbell Committee recommendations (see Committee of Inquiry into the Australian Financial System 1984). This Committee reported favourably, although by that time the government had already implemented some of the Campbell Committee's recommendations.

Reform of the finance sector encompassed several main areas (Harper 1986, Table 1; Merrett 2002d, pp. 277–8). First, exchange controls were lifted and the Australian dollar was floated in the last quarter of 1983. Second, controls on interest rates were progressively removed from the early 1970s to the mid-1980s. Third, quantitative controls that had been designed to regulate bank lending were either removed or made less restrictive. Fourth, 16 foreign banks were invited in 1985 to establish operations in Australia, and banking authority was granted to Macquarie Bank Limited. Fifth, there was an increased emphasis on prudential regulation which, for example, involved the introduction of a raft of new regulatory authorities.

These reforms caused a rapid expansion in the role of the finance sector in the Australian economy. The share of the finance industry in aggregate GDP increased from about 4.2 per cent in 1980 to 6 per cent in 1990, with most

of the increase occurring from 1985 to 1988 (ABS 2013a). The composition and operation of the sector were also significantly affected. Relaxing the constraints on banks allowed them to re-establish a position of primacy in the financial market. For example, from 1983 to 1993 the market share (by assets) of banks increased from 44 to 50 per cent, and that of NBFIs decreased from 31 to 15 per cent (Dyster & Meredith 2012, p. 267). New banks took some time to get a toehold in the market, and by 1990 accounted for about 10 per cent of market activity (Ackland & Harper 1992, pp. 50–2). The extra scope for competition in the finance market was manifested in a narrowing in the margin on wholesale lending to large firms. However, margins on retail lending, where there was less effect on competition, increased throughout the 1980s (Milbourne & Cumberworth 1991). The efficiency consequences of finance-sector reform have been the subject of considerable debate. The Wallis Committee (see below) concluded that the reforms improved allocative efficiency and product innovation (Harper 1997, pp. 289–90). On the other side of the debate, critics such as John Quiggin have argued that most of the innovations attributed to reform in fact occurred due to technological change; and that any accounting of the consequences of reform should also take into account innovation ‘failures’, such as foreign currency loans (Quiggin 1996, pp. 92–4).

The reforms to regulation of the finance sector in Australia had been primarily implemented to improve the capacity to manage the macroeconomy. Certainly, they contributed to a major makeover of the approach to macroeconomic policy making. By the early 1990s there was a new model of macroeconomic management, one that used the policy rate to maintain the rate of inflation within a target band (Macfarlane 2006).

While it is possible to find differing opinions, the general view appears to be that this new approach to policy making has played an important role in Australia’s macroeconomic stability since the early 1990s (e.g. Macfarlane 2006, pp. 86–7; Davis 2011, p. 301). Having a floating exchange rate has also been suggested as a factor that has allowed smoother adjustment to external shocks in the Australian economy (Gruen 2011). In contrast to these longer-term effects, the immediate macroeconomic consequence of the new financial system was significant instability. In the mid- to late 1980s rapid growth in credit combined with a lack of appropriate prudential standards by banks caused asset-price inflation and an increasing proportion of low-quality loans. A subsequent collapse in share prices and commercial property prices in the late 1980s and early 1990s meant major losses for Westpac and ANZ, as well as the demise of several state banks and corporate empires

across Australia. This episode contributed to the poor performance of the Australian macroeconomy at the time (Gizycki & Lowe 2000, p. 186).

This episode of the late 1980s was seen to have revealed problems with the new regulatory system, and hence gave rise to further reforms in the finance sector. There was, for example, a shift away from rules-based supervision towards on-site reviews that focused on how financial institutions measured and managed their risks (Gizycki & Lowe 2000, p. 203). The Wallis Committee, established in 1996, provided the opportunity for a more thoroughgoing review of regulation of financial markets. The Committee recommended moving the basis for regulation from institutions to functions (Financial System Inquiry 1997; Harper 1997). Responsibility for prudential supervision was assigned to APRA, and market conduct and disclosure became the responsibility of ASIC (Gizycki & Lowe 2000, p. 203).

Manufacturing industry

An orthodoxy on the desirability of assisting industry and protecting it from foreign competition prevailed for much of the 20th century (Wilson, this volume). High levels of protection for most manufactured products were in place by the 1920s, and while the form of protection changed over time, substantial barriers to import competition remained 50 years later (Lloyd 2008, pp. 124–7; Pincus 1995). By the 1960s, however, there was an emerging recognition of the costs of this assistance, and doubts whether it was in the national interest (Anderson & Garnaut 1987; Glezer 1982). In inducing this change in attitude, key early contributions were made by academic economists – for example, Corden (1963) who introduced measurement of the effective rate of protection to Australia. This academic research began to have some influence on the bureaucracy in the 1960s, in particular at the Tariff Board under its Chair, Alf Rattigan. The establishment of the Industries Assistance Commission in 1973, with an expanded responsibility for both tariff protection and general assistance, in particular, guidelines that allowed it to propose policies in the national interest, has been considered a critical development (Kenwood 1995, p. 74). A series of major government reports in the second half of the 1970s further contributed to a change in opinion within government. The 1976 Jackson Report suggested that an import-replacement strategy would not retrieve the position of manufacturing industry in Australia (Committee to Advise on Policies for Manufacturing Industry 1976); while the Crawford Report recommended a gradual reduction in tariff protection and instead assistance to be provided

by way of export incentive grants (Study Group on Structural Adjustment 1979). These reports recognised the growing industrialisation of many of Australia's Asian neighbours, and that their low wage costs would only increase the difficulty of maintaining low-skill, labour-intensive manufacturing in Australia. Further academic research, especially by the ORANI modelling group, was important in providing quantification of the costs of assistance (Powell & Snape 1993). The possibility of negotiating for reforms of international agricultural protection that would benefit Australia also seems to have been influential in forming government policy on protection to manufacturing industry (Anderson 1993, pp. 114–15).

The history of reduced assistance to manufacturing began in the early 1970s. In July 1973 the federal Labor government made an across-the-board cut to tariff rates of 25 per cent. The Coalition government, which came to federal office in the mid-1970s, took two different paths to adjusting policy on assistance. Protection to labour-intensive sectors, such as PMVs and TCF, was increased substantially, but at the same time in other sectors tariff reductions were continued (Dyster & Meredith 2012, pp. 269–70).

When Labor was returned to government in the early 1980s, it initially sought negotiated decreases to tariff protection for selected industries, including steel and PMVs (Albon & Falvey 1992, pp. 157–9; Capling & Galligan 1992). Industry plans, such as the Button Plan for the PMV sector, were intended to improve efficiency through a corporatist approach to inducing restructuring. The objective was to reduce the number of motor-vehicle producers and the number of vehicle models being produced, with export facilitation payments being provided as a quid pro quo for tariff reductions. By the early 1990s there were four PMV manufacturers remaining in Australia: Toyota, Mitsubishi, General Motors–Holden and Ford (Dyster & Meredith 2012, p. 330).

In May 1988 the Labor government shifted to implement more general reforms, announcing that most tariffs above 15 per cent were to be progressively reduced to that level over a four-year period, while tariffs between 10 and 15 per cent would be reduced to 10 per cent. This policy was extended in May 1991 with the decision that most tariffs would be reduced to 5 per cent by 1996; and that tariffs on the PMV and TCF sectors would be decreased to 15 per cent and 25 per cent respectively by 2000 (Kenwood 1995, pp. 77–9).

Simulations of the 1988 and 1991 reforms estimated that these tariff reductions would generate increases in real GDP in Australia of 0.5 per cent and 1.1 per cent respectively (Albon & Falvey 1992, pp. 150–1). By contrast, the predicted effect of policy changes made in the 1970s is ambiguous; in fact Quiggin (1996, pp. 136–7) estimates that the effect of higher dispersion in

rates of protection outweighed the effect of a lower average rate of protection, so that wellbeing would have been lowered due to those tariff changes.

Within manufacturing there were large decreases in employment during this period. From 1973 to 2000 the share of employment accounted for by jobs in manufacturing industry fell from 23.9 per cent to 12.0 per cent (ABS 1986, Table 20; ABS 2013d, Table 4). Establishing how much of this decline was due to reductions in tariff protection is, however, difficult. Fahrner and Pease (1994, pp. 199–204), for example, found that from 1981–82 to 1991–92 changes to imports were directly able to explain a large fraction of changes in employment only for a small segment of manufacturing industry – the chemical and other machinery sectors; and that a much more significant influence causing a decrease in employment was improvements in productivity.

Another dimension of reform of international trade policy since the 1980s has been Australia's increasing involvement with the negotiation of multi-lateral trade agreements (Anderson 2003, p. 178). With the decline in food prices in the 1980s, Australia formed the Cairns Group of non-subsidising agricultural exporting countries, with the objective of promoting removal of protection on farm output. This initiative was important in having agriculture and services restored to the GATT agenda at the Uruguay round of negotiations which commenced in 1986, although the influence of the group has declined in recent years (Dyster & Meredith 2012, p. 241).

Agricultural sector

During the 1950s and 1960s, the priority of agricultural policy in Australia was to achieve an expansion in the size of the industry to assist the goal of national development – by providing food for a growing population and as a source of export revenue (Edwards 2006, p. 4). A variety of policies to promote this objective were developed: commodity price stabilisation plans; input subsidies; tax incentives; and public support of activities such as R&D and marketing (Butlin, Barnard & Pincus 1982, p. 133). For example, by the early 1970s stabilisation schemes existed for a large fraction of agricultural output: wheat, wool, milk and dairy products, dried vine fruits, eggs and sugar (Edwards 2006, p. 14; Kenwood 1995, pp. 48–53).

Between the 1970s and 1980s a change began to occur in the policy environment for the agricultural sector. Whereas the 1974 Harris Green Paper on rural policy retained an efficiency rationale for government intervention, the 1982 Balderstone Report on agricultural issues explicitly advocated deregulation, and argued that the basis for any compensation to producers should be

on equity rather than efficiency grounds (Edwards 2006, pp. 10–11; MacLaren 1998, p. 36).

A variety of influences contributed to this change. Policy making for the agricultural sector was affected by the same ‘costs of assistance perspective’ held by the manufacturing industry (Lloyd 1973); it was also influenced by the pro-reform agenda of the National Farmers’ Federation, and the declining value of the support provided to producers by the existing policies (Martin 1990, pp. 198–202). Factors external to the industry were also important. A mining boom in the 1970s reduced reliance on the agricultural sector as a source of export income; Britain joining the Common Market removed Australia’s preferential access to that market; and the move away from a fixed exchange rate made it increasingly difficult to administer price stabilisation schemes (Edwards 2006, p. 8).

From the 1940s to the early 1970s the agricultural sector had benefited from increasing rates of assistance. After that time, however, this pattern of support was reversed. As Anderson, Lloyd and MacLaren (2007, p. 473) describe: ‘Australia’s agricultural subsidies and regulatory interventions ... have been close to eliminated over those 35 years. The average NRA to the farm sector fell from 16 per cent in the early 1970s to less than 2 per cent this decade.’

A prominent aspect of microeconomic reform of the agricultural sector has been the demise and dismantling of price stabilisation schemes. The most spectacular case was the collapse of the AWC in the early 1990s (see Bardsley 1994; Massy 2011). Introduced in 1973, the Wool Reserve Price Scheme initially operated relatively untroubled, and was judged to have reduced price volatility. But in 1987 the federal government passed the right to set the reserve minimum price for wool to the AWC. Almost immediately the reserve price was increased by 70 per cent, from 508 cents/kg in 1987 to 870 cents/kg in 1988. This induced a boom in wool production, and a shift by textile manufacturers to using cotton and synthetic fibres. The stockpile grew from virtually zero in 1988 to 4.6 million bales at the end of 1990, putting the stabilisation fund \$2.7 billion in debt. In May 1990 the federal government assumed control of the stockpile and debt, and reduced the reserve price to 700 cents/kg. When this failed to stimulate demand, and the stockpile kept growing, the government was forced to end the scheme in February 1991, at which point the price fell to 430 cents/kg. The ultimate cost to taxpayers of this failure has been estimated at \$1 billion (Richardson 2001, p. 109). (For accounts of the ending of the wheat and dairy stabilisation schemes, see Edwards 2006, pp. 18–23; Edwards 2003.)

Another theme of agricultural policy from the 1970s onwards has been the provision of adjustment assistance (Kenwood 1995, pp. 54–6; Edwards 2006, pp. 25–6). This has, for example, involved payments to facilitate adjustment to larger-scale farming activity (loans to enable this to occur, and assistance for displaced farmers); as well as various types of short-term assistance, such as for effects of droughts on farm income. There has at times been a questioning of the efficiency rationale for this assistance (e.g. IAC 1984), which has led to reforms, such as the introduction of the Agriculture – Advancing Australia Package in 1997, intended to limit the extent to which assistance represented a substitute for subsidies.

Government sector

By the 1950s an extensive range of government business enterprises existed in Australia, including businesses involved in the supply of postal services and telecommunications; air, railway and shipping services; energy utilities; and banking. The establishment of these enterprises was often accompanied by entry regulations that made the government business a monopoly supplier (see Butlin, Barnard & Pincus 1982).

Since the late 1980s many government business enterprises have been corporatised or partially/fully privatised. The objective has been to create incentives for management to focus on commercial goals – such as profit maximisation. Privatisations have included the Commonwealth Bank (1991–96), Qantas (1993–95) and the Commonwealth Serum Laboratory (1994). Entry to markets in which government businesses operate has also been deregulated.

Reform of the government sector has extended to services that had been supplied from within the public sector. While governments in Australia were (to differing degrees) already using contracting out before the commencement of microeconomic reform, the Industry Commission (1996, p. 73) suggested: ‘In the early 1990s there was a sharp rise in the use of contracting in many jurisdictions.’ For example, local governments in Victoria were required to have competitive tendering for at least 20 per cent of their total expenditure by 1994–95, rising to 50 per cent by 1996–97. The services contracted out by government have encompassed a wide variety of activities: prison services in Victoria, labour market training for job seekers by the federal government under the Job Network Scheme, and garbage services in many parts of Australia.

Reforms to government business enterprises attracted considerable controversy. The initial attempts at privatisation by the leadership of the federal

Labor government, for example, met substantial opposition from within the Labor Party, causing delays in reform (Kelly 1992, p. 391). One issue that received a deal of attention was how the government's budgetary bottom line was affected by selling off assets. Harris and Lye (1998) examine nine privatisations that took place in Australia prior to the late 1990s. They find a mixed story: the sales of the Commonwealth Bank and GIO reduced the net worth of the public sector; but sales of CSL, Qantas and Telstra had a positive impact on this net worth. While some underpricing was therefore observed, Harris and Lye (1998, p. 28) argue that the Australian experience 'compares favourably with international comparisons'. The practice of contracting out was equally subject to scrutiny. Critics claimed that accountability and quality standards would be reduced by private-sector service provision (e.g. Quiggin 1996, ch. 13). Proponents of contracting out, however, argued that the efficiency savings were large, and that issues such as service quality could be addressed by appropriate management (e.g. Domberger 1994).

Transport, communications and utilities

The transport, communications and utilities sectors in Australia have traditionally been highly regulated. Regulation has involved public ownership, often accompanied by restrictions on entry to compete with the public supplier, and with mandated cross-subsidies to ensure equality of access to the services.

Major reform of the airline industry occurred in 1990 when the existing policy restricting the domestic market to two suppliers was abolished, as were restrictions on the discounting of fares (Dwyer & Forsyth 1992, p. 226). This led to attempts by new suppliers to enter the market. These attempts brought short periods of heavy competition, but the eventual exit from the market of the new supplier (Quiggin 1996, p. 104). In the mid-1990s the sell-off of major airports was announced, with the leases to most of these airports being sold by the late 1990s (Industry Commission 1998, p. 10).

Reform of shipping in the 1980s sought mainly to improve labour productivity by reducing manning levels. The *Navigation Act 1912* had restricted coastal shipping trade to Australian-licensed vessels, and a large share of the gains from this monopoly appear to have been extracted by maritime unions through high wages and manning levels on ships (Dick 1992, p. 205). Financial assistance was provided for the purchase of new ships in return for reduced crew sizes on those ships, while the Waterfront Industry Reform Authority was given the tasks of introducing enterprise bargaining to stevedoring and

implementing a scheme of accelerated retirement (Kenwood 1995, p.112). In 1998 the Patrick dispute at the Melbourne docks became the basis for further reform that substantially reduced employment levels (Lawrence & Richards 2004).

There was major deregulation of interstate road haulage in the 1960s (Forsyth 1992, p. 191). Some deregulation of intrastate passenger markets also occurred; for example, in 1993 Victoria contracted out the right to supply about 80 per cent of bus services in Melbourne (Industry Commission 1998, p. 102). This is not to say that all regulation was removed during this period; for example, transport by taxis remained regulated in most Australian capital cities. In the other area of land transport, rail, there was also reform, such as privatisation of the National Rail Corporation in the late 1990s (Industry Commission 1998, pp. 90–1).

From 1946 to 1975 the Postmaster-General was responsible for post and telecommunications services in Australia. In 1975 these services were separated. The Australian Postal Commission was to supply postal services and AUSAT, OTC and Telecom became the suppliers of respectively satellite, international and domestic telephony services. Australia Post and the telecommunications suppliers were corporatised in the late 1980s. In the mid-1990s a variety of restrictions on competition in the postal market were liberalised. In 1992 competition was introduced in the telecommunications market with a merger of OTC and Telecom creating one supplier, Telstra, and AUSAT being sold to Optus to create a second supplier. An extra supplier, Vodafone, was introduced into the mobile phone market in 1993. Telstra was partially privatised in 1997, and in the same year the telecommunications market was opened to new entrants (Albon 1998, pp. 315–19).

Reform of the utilities sector began with the electricity industry in the early 1990s. An agreement to integrate supply of electricity from that time came to fruition in December 1998 with the commencement of the National Electricity Market. In preparation for the commencement of the national market, by the mid-1990s most state governments had undertaken steps to break what had been a monopoly public supplier of electricity into separate units responsible for generation, transmissions and distribution, and then to corporatise or privatise those units (King 2003, pp. 38–9). Reform of the gas sector was slower to begin, with a taskforce to achieve third-party access to transmission and distribution systems only being established in the mid-1990s (Industry Commission 1998, pp. 64–5).

Several studies have examined productivity in the transport and communications sectors in the periods before and after reform, and have found gains.

For example, TFP in domestic aviation has been estimated to have increased by 7 per cent between 1987–88 and 1998–99, and in rail by 8 per cent between 1989 and 1997 (Forsyth 2000, p. 254). Generally, however, these studies do not seek to control for other influences on productivity, and because they are examining changes over a decade or so, this raises the question of how much of the increase in productivity can be attributed to the reform. The results on the effect of reform on productivity are most convincing where a narrower time period around a large-scale reform is considered; for example, the study of late 1990s waterfront reforms by Lawrence and Richards (2004) found an increase in TFP of about 20 per cent in five years. Those who believe that the benefits of reform of the transport sector have been limited argue that this is due to particular features of that sector, such as high levels of market power being the natural state in areas like cargo handling and domestic aviation (Dick 1992, p. 211; Quiggin 1996, p. 112).

Labour market

Labour market regulation in Australia prior to the 1980s involved a central role for compulsory arbitration through industrial tribunals; encouragement of collective representation of workers via trade unions; and a system of awards which specified minimum terms and conditions of employment. Coverage of the award system was about 80 per cent in the 1980s (Borland 2003, pp. 104), with each award specifying a different set of binding minimum wage rates for an extensive array of job categories. For example, the award for TCF workers specified more than 700 separate job classifications and the metal industry award had 348 categories of workers (Keating & Dixon 1989, p. 28).

From 1983 to the early 1990s, wage setting in Australia was mediated through the Prices and Incomes Accord between the ACTU and the federal Labor government. The Accord was an income policy-style agreement designed to bring the existing high rates of wage inflation of the late 1970s and early 1980s under control. Early versions of the Accord involved a high degree of centralisation, with no wage increases allowed beyond those granted in national wage cases (Chapman 1998). Later versions introduced a degree of decentralisation, and can be seen to constitute the beginnings of a shift to enterprise bargaining (Kenwood 1995, p. 133).

Significant legislative reform of Australia's industrial relations system commenced in the late 1980s and early 1990s (Borland 2003). A series of policy changes made by the Labor government (including the *Industrial Relations*

Amendment Acts of 1992 and 1994 and the *Industrial Relations Reform Act 1993*) encouraged the spread of enterprise bargaining, allowing a collective agreement for an individual enterprise registered with the IRC to replace the award that would otherwise apply to those workers, provided a no-disadvantage test was met. Awards were defined to constitute a 'safety net'. The Liberal–National Party government's *Workplace Relations and Other Legislation Amendment Act 1996* introduced further reforms. These included capacity for agreements with individual workers, and a reduced role for the award system, with the IRC restricted to setting minimum wages and conditions regarding 20 allowable matters, and no scope to arbitrate on matters above the minimum safety net.

The changes made to Australia's industrial relations system in the 1990s were associated with a growth in enterprise bargaining and a decreased role for industrial tribunals (Wooden 2001, pp. 244–5). By 2000, 37 per cent of workers were covered by registered collective agreements, while the proportion still covered by awards had fallen to 23 per cent (Borland 2011, p. 213). There is evidence that this shift to decentralised wage setting has had a significant effect on wage outcomes in Australia – namely reducing the incidence of pattern bargaining, and altering the inflation–unemployment trade-off (e.g. Borland 2012a).

Competition policy

The landmark legislation in the history of competition policy in Australia is the *Trade Practices Act 1974* (TPA). The Act introduced a Trade Practices Commission, and adopted outright prohibition of specified practices, with substantial penalties for non-compliance. For example, Part IV of the Act includes sections that prohibit price fixing, resale price maintenance, exclusive dealing, and mergers that would have the effect of substantially lessening competition (King 2003, p. 33). The Act was a significant extension of initial trade practices legislation introduced in 1965 and 1971 (Kenwood 1995, pp. 90–1; Freyer 2006, pp. 320–35; Merrett, Corones & Round 2007). In 1973 a Prices Justification Tribunal was established, with responsibility for monitoring price increases and exerting moral suasion to seek to restrain excessive increases. The Tribunal was abolished in 1981, but then reincarnated as the Prices Surveillance Authority in 1984, with the objective of 'promot[ing] pricing restraint by carrying out surveillance and reviews of specific price changes' (Kenwood 1995, p. 98).

In October 1992 the federal Labor government established the Independent Committee of Inquiry on National Competition Policy to report on whether and how to extend coverage of the TPA (Hilmer 1995, p. 2). The Committee released its report (hereafter referred to as the Hilmer Report; see Hilmer, Rayner & Taperell 1993) in August 1993. The report went well beyond the scope of the TPA, recognising, as Hilmer has written (1995, p. 2), that 'in most cases the factors that either encouraged or limited competition were not the rules of the *Trade Practices Act* but other regulations, market structures that resulted from the actions of governments in establishing and operating businesses over many years, and/or the direct actions of governments themselves'.

In assuming this broader purpose, the Hilmer Report became the basis of the overall agenda for microeconomic reform in Australia from the mid-1990s onwards. The report contained recommendations in four main areas: reforms of the TPA; new approaches to regulation of competition; new administrative arrangements for implementing the proposed reforms; and an ongoing process of review (see King 2003, pp. 270–2; Hilmer 1995, pp. 2–5). The Council of Australian Governments accepted the major recommendations of the Hilmer Report in February 1994. In April 1995 the Competition Principles Agreement to implement the recommendations was signed by the federal and all state governments (King 2003, p. 32). Reforms to the TPA were made in 1995 (with accompanying legislative reforms by the states) to broaden its coverage as recommended by the Hilmer Report, and to introduce a new Part IIIA establishing procedures for access to essential facilities. The Trade Practices Commission and the Prices Surveillance Authority were merged in November 1995 to create the ACCC (King 1997, p. 271). The ACCC has the responsibility for implementing competition policy through the TPA; it also has responsibility for regulation of telecommunications, airports and utilities, as well as being the 'umpire' for access disputes (King 2003, p. 32).

A major issue of contention that has emerged from the Hilmer reforms is the access arrangements that established a process for a potential supplier to obtain access to an input produced using natural monopoly technology. Criteria defining essential facilities that would be subject to access provisions, the extent to which the asset owners should be able to be obligated to provide access, and the appropriateness of reliance negotiation as the core approach for establishing access, have all been the subject of dispute (see, for example, King 2003; Ergas 2008; Fletcher 2009).

Overall effect of reform on Australian economic performance

The implementation of microeconomic reform in Australia has been spread over quite a long period, during which time there have been many other major influences on economic activity. This makes it particularly difficult to measure the effect of reform on macroeconomic aggregates.

One line of commentary has sought to associate the productivity 'surge' that occurred in Australia from 1993–94 to 1998–99 with microeconomic reform (Parham 2004, p. 253; Banks 2010, p. 9). But it is important to note that there is little direct evidence of effects of reform on labour productivity in the 1990s. Instead, what is usually presented is evidence by exclusion. For example, the Productivity Commission (2009, p. 17), in its submission to the 2009 House of Representatives Select Committee Review of productivity, stated: 'The removal of these [other] possible explanations as likely causes of the surge in productivity leaves the reforms of the latter part of the 1980s and 1990s as the prime candidate.'

Studies which show improvements in efficiency in individual sectors, at around the time the reform took place, provide stronger evidence – for example, in the rail, communications and utilities sectors, and on the water-front. Nevertheless, even these studies need to be regarded as suggestive, since they draw mainly on time series data on productivity, with microeconomic reform just one of several possible explanations for changes that have occurred. To the extent that reform has altered the relative productivity of different sectors, or improved the capacity of businesses in those sectors to adapt to shocks to their operating environments, it may reveal a change in Australia's institutional comparative advantage (Hall & Soskice 2001).

A major area of benefit from microeconomic reform is likely to have been an improved capacity for the government to manage the macroeconomy. For example, given the circumstances that existed prior to reform, it is difficult to imagine how Australia could be better off with a fixed exchange rate. A related effect is the improvement in the inflation–unemployment trade-off that occurred in the mid-1990s, apparently associated with the introduction of enterprise bargaining.

There may also have been costs imposed due to microeconomic reform. One potential source is adjustment costs, particularly from worker displacement due to structural change caused by reform. It has been difficult, however, to do more than make the point that these costs might exist (Borland 1998). A second potential source of costs is the distributional consequences

of microeconomic reform. Aggregate net gains may mask a division between winners and losers. An example is where cross-subsidies for some categories of consumers have been removed. A third potential source is reduction in the quality of output or a perceived threat to community service obligations (e.g. Quiggin 1996, p. 193).

Policy reform can have major consequences for political economy, and this is likely to have been a further effect of microeconomic reform in Australia. Changes to economic policy affect the relative economic importance and power of different groups in society, and hence change the balance of influences on policy making (Acemoglu & Robinson 2013). The episode of microeconomic reform in Australia can, for example, be argued to have increased the political influence of the finance sector and reduced that of the manufacturing sector. This in turn may have affected subsequent policy making.

The evolution of Australian macroeconomic strategy since World War 2

MICHAEL KEATING¹

A country's economic strategies typically reflect its current circumstances, history and values. As Australia emerged from World War 2 its inherited economic strategy had been built around imperial preference, and population and capital flows from Britain. But Australia's dependence on commodity exports never provided a sufficient base for the increased population, while the large fluctuations in commodity prices made the economy prone to instability. Over time, therefore, that strategy sought greater security through a broader economic base that relied less on commodity exports.

Other significant historic influences include Australians' preference for government-determined outcomes, even if efficiency were sacrificed, probably because of the seemingly greater control of outcomes that government intervention promised. To some inside and outside Australia, this was perceived as a significant distrust of markets (Caves & Krause 1984, p. 2). Furthermore, Australian strategy has traditionally been influenced by the notion that government has a duty of care to its citizens who might otherwise suffer from the risks associated with the vicissitudes of the market. Thus, over time, an expectation developed that government should ensure a minimum living standard and minimise and/or compensate for disadvantage as markets and policies change.

This chapter considers these various influences on government economic strategy and how far and why they have been modified over the last 70 years. Part of the reason why strategy has evolved over time is that the nature of the problems is perceived to change. Accordingly, it is convenient to consider the Australian post-World War 2 experience in three sub-periods: from the war

¹ This interpretation of Australia's macroeconomic strategy draws on the author's experiences as a senior government official for part of the period examined.

until the late 1960s, when the focus was particularly on national development; the years of stagflation from the early 1970s to around 1991; and the adoption of a more flexible market-based approach to economic strategy from the mid-1980s onwards. The final section of the chapter provides an overall assessment of the changes that have occurred.

Postwar reconstruction and national development, 1943–70

The focus of Australian economic strategy for the first quarter of a century after World War 2 was economic development. Essentially, this represented no change in Australia's long-term goals and neither did the means adopted vary significantly. As Treasurer Chifley proclaimed in 1942, 'our post-war aim must be the physical development of our country linked up with expanded production and increased population' (quoted in Cornish 1981, p. 8). In one major respect, however, the postwar strategy was different – it was backed by a new determination and a new approach to pursuing full employment, which was enshrined in a White Paper released in 1945.

Australia's most serious postwar problem was expected to be inflation. The nation's capital stock had declined due to low wartime investment and there was an urgent need for new investment, including in housing and urban amenities. Wartime controls were suppressing pent-up demand, but inflation could potentially explode unless the controls were only gradually removed. At the same time the federal Labor government and many advisers were fearful about the longer-term outlook. The Great Depression was a vivid recent memory, and the fear was that the experience following World War 1 would be repeated, with a short inflationary boom, followed by a severe recession. In particular, the military forces and employees engaged in wartime production needed to be retrained and new jobs had to be created to absorb this surplus labour. Policymakers were also worried about Australia's reliance on commodity exports, and feared that after an initial postwar boom, the interwar experience of low and unstable commodity prices would recur and chronic balance of payment problems would return (Schedvin 1992, p. 62).

Improvements in welfare assistance were another key element of Labor's strategy for postwar reconstruction, and a number of new programs were introduced. However, the level of benefits and their coverage were still only modest. Consequently, the financial implications for the Budget were not great, with total expenditure on social security and health only accounting for 14 per cent of the federal Budget and 1.8 per cent of GDP in 1948–49

(Jones 1983, p. 50), compared to 50 per cent and 12.8 per cent respectively in 2011–12 (Statement 6 in Australian Government 2012, p. 23). As Treasurer Chifley put it in 1944, ‘our objective is not primarily social security, but rather the much higher objective of full employment of manpower and resources in raising living standards’ (quoted in Jones 1983, p. 50). The policy goal of full employment was to be achieved through a combination of support for economic development and Keynesian stabilisation policies, with economic development involving in particular accelerated population growth and the expansion of manufacturing industry. The two branches of this economic strategy and the inevitable tensions between them will be described in more detail below.

Between 1946–47 and 1948–49 the economy grew at the very fast average annual rate of 6.5 per cent (Maddock & McLean 1987, p. 363) as the Labor government took a number of initiatives to kick-start national development. New industries – such as motor vehicle production – were started up, and investment in major new infrastructure projects – most notably the Snowy Scheme – was encouraged. From 1950 the conservative Coalition government broadly maintained this strategy for national economic development over the next 20 or so years. In particular, it continued an exceptionally large immigration program, which in turn required heavy public investment in infrastructure. In addition, the government pursued a rapid increase in private investment augmented by foreign capital flows, and a deliberate policy of protecting manufacturing industry.

The average level of manufacturing protection in the 1950s and 1960s remained similar to before the war, but unlike most other developed countries, Australia did not participate in multilateral tariff reductions during these two decades (Anderson 1987, Table 7.5). Private investment was assisted, with generous depreciation allowances and low interest rates, and foreign investment was actively encouraged. Over these two decades, private capital inflows accounted for almost a quarter of business investment, but retained earnings also accounted for an increasing share over time. By 1969–70 total private fixed capital expenditure in real terms was three and a half times higher than in 1949–50 (Maddock & McClean 1987, p. 363). In the 1950s manufacturing dominated this investment, but in the following decade mining and finance joined manufacturing as the major investing sectors (Maddock 1987, p. 87). Australia’s economic policymakers sought security by broadening both the country’s industrial base and its markets. Indeed, arguably the most significant economic policy innovation during the Menzies era was the negotiation of a trade treaty with Japan in 1957. This treaty facilitated

a new trade direction away from the traditional reliance on Britain in favour of new markets in East Asia. Ten years later Japan had become the biggest single market for Australian exports, and the growth of the Asian market has underpinned Australian development ever since.

Overall, the two decades of the 1950s and 1960s are now seen as a golden age, with real GDP increasing at an annual average rate of 4.2 per cent in the 1950s and 5.1 per cent in the 1960s (Maddock & McLean 1987, p. 363). Of course, Australia was not alone in experiencing exceptional economic growth over these years, and the relatively benign global conditions undoubtedly helped Australia's performance. But relative to other developed countries, Australia was unusual in its rapid population growth, averaging 2.4 per cent per annum in the 1950s and 2 per cent in the 1960s (Maddock & McLean 1987, p. 354). This increase was partly due to higher living standards encouraging higher birth rates, but government policy critically influenced the rate of net migration, which accounted for some 40 per cent of the population increase over these two decades (Hatton & Withers, this volume). Domestic demand, especially for housing and related durables, expanded rapidly in response to high population growth. But the rise in living standards also contributed to domestic demand, with per capita GDP increasing in real terms at average annual rates of 1.8 per cent and 3 per cent in the 1950s and 1960s respectively. By 1970 per capita consumption was double what it had been 30 years ago in 1940, whereas in 1940 per capita consumption was the same as 30 years earlier (Maddock 1987, p. 79).

Economists' views on Australia's strategy for economic development in the postwar period are divided. Some argue that the policy of protection led to slow trade growth relative to other developed economies. The logic is that, by preventing greater specialisation in what Australia did best, the policy came at a cost to per capita economic growth (Anderson 1987, pp. 189–90). Other economists take a contrary view, arguing that the surge in migrants brought increased skills, which in turn led to higher productivity and per capita incomes – although the evidence suggests that these migrant skills probably made more difference before World War 2 than after it (Pope & Withers 1996). Nevertheless, at the time popular opinion did not question the continuation of the prewar strategy of protectionism through the 1950s and 1960s. Instead, the main tensions in the strategy appeared to arise as pressures from development spilled over and created problems for stabilisation policy. During the immediate postwar years of economic reconstruction, stabilisation policy principally relied on quantitative controls. Key wartime restrictions, such as consumer rationing, and controls over prices and wages,

capital issues, foreign exchange and credit expansion, continued for some years. But as the effects of war receded so did the authority for these direct controls and more of the burden of stabilisation policy was transferred to monetary policy.

In 1945 the Commonwealth Bank formally assumed the position of Australia's central bank. Its role was defined broadly to pursue the stability of the currency, the maintenance of full employment, and the economic prosperity and welfare of the people of Australia. It was clearly established that while the Bank could advise, ultimate responsibility for key decisions remained with the government. In effect, the government thenceforth accepted responsibility for the economic condition of the nation, which at that time represented a significant new interpretation of the state's role in a capitalist economy (Bell 2004, p. 13). Furthermore, not only was the newly established central bank not independent, but for the most part it was subservient to the Treasury, which had better access to the government and a mandate for overall coordination of economic strategy.

By 1948–49 inflationary pressures were building as buoyant exports and high capital inflow led directly to rapid growth in trading bank assets, combined with continuing shortages of consumer and investment goods. Following the outbreak of the Korean War in June 1950, there was a further surge in export prices, particularly wool prices. This increase in purchasing power was superimposed on an economy already suffering from excess demand pressures, stoked by strong capital inflows, wage increases averaging almost 20 per cent in 1950–51, and serious supply bottlenecks. Eventually, by the middle of 1951, with inflation exceeding 25 per cent, a marginally restrictive 'horror budget' was introduced involving tax increases and a budget surplus (Schedvin 1992, p. 172). Interest rates were allowed to rise for the first time in a decade and heavy calls were made on the banks to increase their deposits in their special accounts. Coincidentally, the Korean War ended shortly afterwards and, with demand being squeezed from home and abroad, the balance of payments moved quickly from a surplus to a large deficit. In response, fiscal and monetary policy settings were relaxed and import controls were reintroduced, remaining an important instrument for reconciling national development, full employment and external balance until the end of the 1950s.

In retrospect, possibly the most significant aspect of the 1952–53 recession was that the unemployment rate only rose by 1.5 percentage points, while inflation was quickly brought down to 2 per cent in the same year (Maddock & McLean 1987, pp. 354–7). This suggests that markets were much more responsive to demand management than later on when inflationary

expectations became more entrenched and pressures for rising real incomes were more intense. For the remainder of the 1950s, policy settings were generally consistent with controlling inflation. Furthermore, the balance of payments was less of a problem during these years as strong capital inflow more than covered the gap between exports and imports. By early 1960 the government felt able to abandon import controls. However, wage increases and a tax cut at around the same time led to a surge in imports. The government responded with a credit squeeze and a supplementary budget in November 1960. A sharp contraction of the economy resulted, with unemployment rising to just over 3 per cent – the highest level since World War 2 (Maddock & McLean 1987, p. 354).

A somewhat chastened government reversed its demand-management policy settings in early 1962 and strong economic growth resumed during the remainder of the 1960s, supported by the emergence of a mining boom. For the most part, inflation was relatively well controlled, but from the late 1960s it started to creep up, with the annual increase in consumer prices averaging 6.3 per cent between December 1969 and December 1972.² This problem was not, however, unique to Australia, and at least part of the inflationary pressures that Australia was experiencing towards the end of this long period of economic growth emanated from overseas. Capital inflow was very strong, leading to rapid growth in the money supply³ while rising interest rates threatened to exacerbate the inflow of capital. Active use of the exchange rate could have averted these inflationary pressures from abroad, but the Coalition government never achieved the necessary consensus to implement an appreciation of the dollar.

Generally, the verdict of economists regarding macroeconomic management from the end of World War 2 until the early 1970s is that, with the partial exception of the two episodes in 1952–53 and 1960–61, there was a reluctance to use fiscal policy (Arndt 1960). In practice, fiscal policy proved to be much less flexible than was anticipated in the 1945 White Paper on Full Employment, reflecting the unwillingness by government to vary both taxation and expenditure. Furthermore, Australia was much less inclined to use market instruments in prosecuting its monetary policy than other countries,

2 Increase in household consumption deflator as estimated by the author from data provided in RBA, Historical Statistics, Table go6 hist. All subsequent RBA references in this chapter are to the Historical Statistics. The author is responsible for subsequent calculation of the RBA data.

3 The money supply, M3, increased by almost 21 per cent over the course of 1972 and by another 21 per cent in the next 12 months (RBA, Table go6 hist).

such as the United Kingdom and the United States. Instead, the principal monetary instrument was variations in the amount of reserves that the private banks were required to lodge with the central bank, in so-called special accounts (later renamed 'statutory reserve deposits'). Australia also hung on to import regulation and interest rate controls, and was extremely reluctant to vary the exchange rate (Perkins 1977). Because of its inability to raise interest rates, the Reserve Bank (which became the central bank in 1959) found that it was forced to support the bond market, when it should have been a seller (Schedvin 1992, p. 130). In short, whenever there was a gap between demand and supply in the Australian economy, monetary policy – the only form of stabilisation policy actually used – was hamstrung by the unwillingness to use interest rates and the exchange rate as policy instruments.

This reluctance to use market instruments perhaps partly reflected the afore-mentioned national distrust of markets, but it also reflected the conflicting objectives inherent in the economic strategy throughout the 1950s and 1960s. The Treasury and the federal government tended to give priority to the objective of national development and wanted 'cheap money' to promote faster economic development. In addition, low interest rates were seen as reducing the cost and difficulty of managing the public debt, which was a principal preoccupation of the Treasury. On the other hand, the Commonwealth Bank, especially while Coombs was governor, was preoccupied with the balance of payments and unemployment – with inflation and economic growth being secondary targets (Schedvin 1992, p. 342). A further complication was that the Treasury and the government were disinclined to take action to restrain overheating until the last possible moment, which led to accusations that the economic strategy over these years was excessively 'stop-go'.

On the whole, however, the 1950s and 1960s must be regarded as reasonably successful for stabilisation policy and the overall economic strategy, especially when compared with the experience of the following two decades. But there were warning signs towards the end of the 1960s and early 1970s. For most of the two postwar decades there appeared to be a stable trade-off between inflation and unemployment, and wage demands after the Korean War boom were reasonably restrained, with the 5 per cent average annual increase in average earnings between 1953–54 and 1968–69 being roughly compatible with a 2.5 per cent inflation rate.⁴ While this trade-off between inflation and unemployment, and the associated wage restraint, lasted it greatly

4 Author's estimates using data from ABS Yearbooks.

simplified the task of stabilisation policy. But by the late 1960s this trade-off was breaking down.

Continuing prosperity eventually led to rising expectations for living standards and consequently increased pressures for wage rises and higher public expenditure. Furthermore, the more volatile exchange rates following the breakdown of the Bretton Woods system in 1971 removed another source of discipline over wage increases. Instead, some argue that monetary policy became less effective in restraining wages when exchange devaluation became possible.⁵ Thus, by the beginning of the 1970s, inflation and unemployment rose together: consumer prices increased at an average annual rate of nearly 7 per cent in 1971–72 and 1972–73⁶ and unemployment jumped by nearly 1 percentage point over these two years (Maddock & McLean 1987, p. 355). Inflationary expectations were becoming entrenched and the fundamental conditions that had propelled economic expansion in the previous two decades had been eroded and the stagflation that marked the next two decades had begun.

Stagflation, 1970s and 1980s

The election of the first Labor government in 23 years at the end of 1972 captured a shift in the popular mood: after two decades of unprecedented prosperity, Australians had come to believe that continuous improvement in living standards was the norm and even their right. The new government offered the promise of new horizons based on a comprehensive program to improve the quality of life and social equity. This program involved a major increase in public expenditure, hopefully to be financed through continued economic growth. Wage increases were also encouraged. On the other hand, from here on there was less emphasis on national development, as rising concerns about the environment, and later increasing unemployment, trumped the traditional desire for population growth through migration. Consequently, there was also less need to promote increased job opportunities in manufacturing.

The immediate difficulty facing the new government at the end of 1972 was the high rate of inflation, which was being fuelled by a build-up in liquidity through very strong exports and capital inflows. The following year

5 Schedvin (1992, p. 459) concludes that 'as a broad generalisation it can be said that under Bretton Woods wages growth adjusted to prevailing monetary conditions; after 1971 the relationship was reversed'. See also Hicks (1982).

6 Household consumption deflator: RBA, Table go6 hist.

the first international oil crisis exploded and many OECD countries were plunged into recession and rising unemployment. The stage was set for a period of stagflation internationally. In response, Australia tried a number of alternative strategies over the next 20 years before stagflation finally ended in Australia following the 1991–92 recession.

At first the new Labor government was slow to recognise the danger of stagflation, and for its first 18 months it tried through its policy to reconcile the largely incompatible twin goals of lower inflation on the one hand, and increased public expenditure and support for real wage rises on the other. During these initial months demand pressures were principally relieved by increasing imports. Thus, in its first 13 months, the government revalued the exchange rate several times by a total of 22 per cent against the TWI (RBA, Table f11 hist).⁷ In addition, there was a uniform tariff reduction of 25 per cent in July 1973. Initially, there was the traditional reluctance to allow interest rate rises, but the difficulties in directly controlling liquidity meant that interest rates were eventually allowed to rise to new heights, with 90-day commercial bill rates reaching 21.75 per cent in mid-1974, while the ‘controlled’ yield on 10-year bonds reached 10 per cent a year later (Schedvin 1992, ch. 14). On the other hand, fiscal policy was expansionary. Over 1973–74 and 1974–75 real budget outlays increased by 3.6 per cent and 14.5 per cent respectively, and the budget out-turn suggested an expansionary impact equivalent to almost 3 per cent of GDP (Pagan 1987, p. 117). In addition, government support for wage increases led to average earnings increasing by 50 per cent from the December quarter 1972 to the December quarter 1974 (RBA, Table g06 hist).

By mid-1974 unemployment started to rise and there was increasing contention within the Labor government regarding both the primacy of its incompatible objectives and the means of pursuing those objectives. The Treasury and Reserve Bank advisers argued that bringing down inflation must be the priority, to be achieved through a ‘short sharp shock’. In their view, under the conditions of stagflation then experienced, the old Keynesian trade-off between inflation and unemployment no longer applied. Instead, a sustained reduction in unemployment could only be achieved through low inflation. But a large number of ministers were unwilling to accept this new doctrine. Rather, they considered that the rapid rate of wage increases was underpinning inflation, and ways should be explored to moderate these increases.

7 The first revaluation, less than three weeks after the government’s election, represented the first time since World War 2 that Australia changed its exchange rate independently of other countries.

In addition, the government was most unwilling to modify its 'program' and tighten public expenditure.

Australia avoided recession in 1974–75, but severe structural imbalances were clearly emerging. A combination of wage increases, higher taxes, exchange appreciation, tariff cuts and high interest rates had squeezed profits and rendered the traded goods sector uncompetitive. In addition, the continuing policy disputes and inconsistencies reinforced a loss of business confidence. The net result was a surge in the value of imports, which increased by a massive 56 per cent in 1974,⁸ while over 1974–75 the real money supply decreased by 1.5 per cent and private investment fell by 9.4 per cent in real terms (ABS, cat. no. 5206, Table 2).

In mid-1975 the government changed course as it moved against leap-frogging wage increases and persuaded the Australian Conciliation and Arbitration Commission to reintroduce wage indexation. In the short term this was judged to lower prospective inflation by several percentage points, although it did have some longer-term disadvantages (Schedvin 1992, p. 526). Fiscal policy was also tightened in the 1975–76 Budget, and although outlays grew by another 12.8 per cent, the structural budget deficit contracted by about half a per cent of GDP (Pagan 1987, p. 117).

At the end of 1975 there was a further change in strategy as the new Coalition government declared that its policies would focus on 'fighting inflation first'. In principle, the Coalition government accepted the monetarist critique of Keynesian policies, and specifically that there was no longer any trade-off between inflation and unemployment. But it is doubtful whether the government fully accepted the other part of the monetarist doctrine – namely that in a world of rational expectations, once the anti-inflation credibility of policy is established, inflation could be brought down painlessly.

In practice, the Coalition government would not provide the Reserve Bank with the independence that would have been a prerequisite to establishing the anti-inflation credibility of monetary policy. Furthermore, the government was reluctant to appreciate the exchange rate to dampen inflation, and although there was some deregulation of interest rates over time, again the government was generally reluctant to agree to interest rate increases. Fiscal policy was tightened in the Coalition's first budget in 1976. It was tightened again significantly in 1979–80 and 1980–81, but that was in response to an upsurge in private demand associated with a mining boom following the

8 Increase in imports as estimated by the author from data provided in ABS, cat. no. 5206, Table 3. All subsequent ABS references in this chapter are to an ABS publication catalogue number. The author is responsible for subsequent calculation of the ABS data.

second oil shock, and was not so much expected to bring inflation down as to prevent it rising further.

Perhaps most importantly, wage indexation continued until 1981, thus locking in real wages and inhibiting much reduction in the rate of nominal wage increases, and therefore in inflation. It also seems likely that the natural rate of unemployment, consistent with non-accelerating inflation, had increased in the mid-1970s in response to the rise in unit labour costs, and the subsequent atrophying of unemployed workers' skills. So this locking in of real wages meant that little progress was made in reducing unemployment. When wage indexation was abandoned in June 1981, the government encouraged collective bargaining, but the economy was booming thanks to a short-lived mining boom, and the unions were able to obtain large wage increases. Real unit labour costs for the private non-farm sector jumped by 3.9 per cent in 1981–82 (RBA, Table go6 hist), and a few months later the economy entered the worst recession since World War 2.

By 1982–83 inflation was running at an annual rate of 10.5 per cent⁹ and unemployment averaged 9 per cent (RBA, Table go7 hist). Furthermore, in the nine years since the onset of stagflation in 1973–74, real non-farm GDP had increased at an annual average rate of only 2.4 per cent compared with a rate of 5.6 per cent in the previous 11 years from 1962–63 to 1973–74 (RBA, Table gro hist). The final response by the Coalition government was to introduce a six-month wage freeze – effectively a repudiation of monetarism – although the easing of macro-policies was fairly modest because of continuing concern about the high rate of inflation.

In response to the disappointing outcomes from the strategy of 'fighting inflation first', the incoming Labor government in 1983 introduced a new strategy based on the Accord between the government and the trade unions. In the government's view, the Australian economy was insufficiently flexible for governments to generate full employment solely on their own initiative. Instead, the new government sought to achieve a bargained consensus with key powerful interest groups that unemployment and inflation should be tackled *simultaneously* through a combination of fiscal expansion and wage restraint (Keating & Dixon 1989).

What was not appreciated initially, however, was the extent of the adjustments that would be needed to cope with Australia's recurring balance of payments problems, which re-emerged again early in 1985. Australian industry had become uncompetitive and, with growth recovering, imports were

9 GNE deflator: ABS, cat. no. 5206, Table 5.

being sucked in, rising from 14.8 per cent of GNE in 1983–84 to 17.5 per cent in 1985–86 (ABS, cat. no. 5206, Table 3). In addition the terms of trade moved strongly against Australia, falling by 16.6 per cent over the two years to December 1986 (ABS, cat. no. 5206, Table 1). This deterioration in Australia's trading position was associated with a rapid build-up in foreign indebtedness, which in turn precipitated a major depreciation of the Australian dollar, with the TWI falling by 41 per cent between November 1984 and its low point of July 1986 (RBA, Table fl hist). The response to this deterioration in foreign indebtedness and the Australian dollar required two key changes to the Accord strategy. First, the government and unions agreed to achieve and subsequently lock in a decline in real wages sufficient to 'validate' the depreciation of the dollar. Second, the commitment to fiscal stimulus was reversed, with the expectation that the improvement in net exports would instead support aggregate demand.

Throughout this period wages policy was a principal instrument of economic policy. It was expected to bear the main burden of unwinding inflation without resort to unemployment, while at the same time achieving an improvement in the profit share and even real wage reductions. However, the difficulties of confronting *both* inflation and real wages made it harder to achieve either objective completely. Although progress in reducing inflation (still running at 6.5 per cent during 1989–90)¹⁰ was disappointing, more progress was made in reducing real wages as this was seen as necessary to improve international competitiveness, business investment and employment growth – the most important priorities. Indeed, between 1982–83 and 1989–90 the economy grew at an average annual real rate of 4.2 per cent, distinctly better than the average growth rate of 2.4 per cent in the previous seven years (ABS, cat. no. 5204, Table 16). Employment growth was also very strong over this period, increasing at an annual average rate of 3.1 per cent, and unemployment came down from an average of 10 per cent in 1983 to an average of 6.2 per cent in 1989–90 (RBA, Table go7 hist).

At the same time, and consistent with the Accord philosophy and Australian notions of fairness, every effort was made to ensure that the real disposable incomes of low- and middle-income households did not fall despite the fall in real wages. This was achieved through a series of improvements in the social wage and wage–tax trade-offs in the Budget. The net result was that between June 1984 and September 1988, real average earnings and real unit labour costs fell by 4.3 per cent and 25.8 per cent respectively (RBA, Table go6 hist)

¹⁰ Household consumption deflator: RBA, Table go6 hist.

while real household disposable incomes per capita increased on average by 2.5 per cent over this period (ABS, cat. no. 5204, Table 37) but with significantly bigger increases for families with children. Furthermore, this support for living standards was achieved while fiscal policy was tightened. Both outlays and revenue fell as a share of GDP, while the Australian government's underlying cash balance moved from a deficit equivalent to 3.3 per cent of GDP in 1983–84 to a surplus equivalent to 1.5 per cent by 1989–90 (Australian Government 2012, pp. 10–16).

Monetary policy generally played a supporting role through this period. Following financial deregulation in 1983, direct control of banks' liquidity and monetary targeting were in turn abandoned. Instead, the principal instrument of monetary policy became the cash rate of interest, which was set by the Reserve Bank and was then transmitted through the commercial banks to affect all other interest rates. Increases in the cash rate during the 1980s were mainly in response to deterioration in the current account of the balance of payments, with a strong correlation between changes in the cash rate and movements in the current account (Bell 2004, Figure 2.2). Monetary policy was not used aggressively to try and reduce inflation, but rather wages policy was relied on for this purpose. Instead, monetary policy then accommodated wage increases so long as they were consistent with government policy – an element of the strategy that was subsequently contested.

The biggest challenge to this strategy came at the end of the decade in 1990. Following the deregulation of financial markets, the banks increasingly chased market share, prudential standards fell, credit growth reached an annual rate of almost 30 per cent and many companies were highly geared. In these circumstances, tight monetary policy – with the cash rate lifted to just below 18 per cent in late 1989 – inevitably resulted in falling asset values, and the economy blundered into recession in 1990–91.¹¹ Nevertheless, that recession does appear to have 'snapped the inflation stick', although the official forecasts at the time do not suggest that officials expected the recession to be so successful in reducing inflation. Thus, even after the full depth of the recession was apparent, in February 1992 the CPI was officially forecast to increase by 2.25 per cent through 1991–92 and by 4 per cent over the year to the June quarter 1993 (Keating 1992, pp. 118–22), whereas in fact the actual increases in the CPI were only 1.2 per cent and 1.8 per cent respectively.

11 The recession was certainly not intended and there were mistakes in forecasting and analysis, with the Treasury in particular continuing to advise throughout 1990 that there would be a soft landing and not a recession (Edwards 1996, ch. 13; Bell 2004, ch. 3).

Furthermore by 1995–96 the actual level of the CPI over this period was more than 4 percentage points lower than officially projected back in 1992.

Reflecting on Australia's experience of stagflation over two decades, much of the debate at the time could be characterised as being between Keynesians, who emphasised the stickiness of prices (particularly real wages), and monetarists, who insisted that flexible markets are the key to achieving full-employment equilibrium.¹² Both these streams of thought influenced Australian economic strategy then and since. The notion of a trade-off between unemployment and inflation once favoured by Keynesians was dismissed early on by official advisers. On the other hand, it was the Keynesian recognition of the stickiness of real wages that led the Labor government to adopt an incomes policy. Most importantly, unlike the monetarists, Australian governments and their key advisers never believed that inflation could be brought down painlessly. For example, Bob Johnston, the then governor of the Reserve Bank, stated in 1989 that to deal with inflation in a permanent way required the acceptance of a great deal more pain than Australian governments and society had so far been prepared to bear (Keating 2004, p. 20). Similarly, Bernie Fraser, the then Deputy Secretary of the Treasury, said in 1984 'that monetary and fiscal policies *on their own* are not capable of reducing inflation ... without incurring socially and politically unacceptable levels of unemployment and other disruption in the short term' (Fraser 1984, p. 231). In fact, when inflation was eventually brought down in the early 1990s it did involve considerable pain in Australia, just as it had in other countries.

At the same time, however, official thinking in Australia was also influenced by overseas experience and discussions about the importance of reducing institutional rigidities that prevent markets, and particularly the labour market, from adjusting flexibly. As monetarism has emphasised, more flexible and competitive markets allow any necessary adjustment to economic disturbances to be achieved more quickly and less painfully. In addition, and again in line with monetarism, strategy now pays more attention to the formulation of expectations. In particular, it is now deemed important to establish the credibility of monetary policy by ensuring that it is committed to achieving a low inflation target and that the Reserve Bank has the necessary independence to honour that commitment. How these conditions for sustained economic growth were achieved and have worked out in practice is discussed in the next section.

12. Friedman (1970, pp. 210–11) argues that 'the relative speed of adjustment of prices and quantities is still the difference in approach and analysis between those who regard themselves as Keynesians and those who do not'.

Sustained economic growth, 1991 to 2011–12

The 20 years since the 1991–92 recession represent the longest period of sustained economic growth since Federation, with an average annual growth rate of 3.5 per cent. The foundations for the economic strategy that underpinned this phenomenal period of sustained growth were the microeconomic reforms which started with the decision to float the Australian dollar in December 1983 (Pomfret, Borland, this volume). Essentially, these reforms were intended to make Australian markets more competitive and more flexible. The traditional Australian suspicion of market-determined solutions was substantially modified in order to increase productivity, improve competitiveness and make the Australian economy less inflation-prone.

Under Labor the achievement of many of these reforms was assisted by the Accord processes. Following the balance-of-payments shock in the mid-1980s, the unions came to accept that future increases in real wages would be contingent on the maintenance of the competitiveness of the trading sector, and that structural reform at the microeconomic level was required to improve Australia's competitiveness and ensure long-run employment growth (ACTU/TDC 1987, ch. 3). Furthermore, the government's willingness to assist those people negatively impacted by structural adjustment, along with the strong growth in employment, improved the environment for union cooperation in achieving these reforms.

By 1991 the government started thinking about a shift away from the centralised system of wage determination in favour of a more flexible enterprise-related system, partly because the government knew that incomes policies have never lasted forever, and partly because the scope for wage–tax trade-offs was becoming more constrained as the recession bit into tax revenue (Edwards 1996, pp. 418–20). Over the next two years the government moved progressively to a system that extended enterprise bargaining to non-union workplaces and ensured that wage increases were much more closely tied to increases in productivity and therefore less likely to be inflationary. New legislation discouraged the Australian Industrial Relations Commission from arbitrating wage settlements. Instead, the Commission was constrained to maintaining a social safety net, based on a set of minimum wages and conditions. In addition, it could arbitrate general increases but they would only apply to those people on the minimum rate in awards (Edwards 1996, pp. 512–18).

Most importantly, these microeconomic reforms ensured that, following the recession-induced fall in consumer price inflation to an annual rate of

0.3 per cent through 1992 (RBA, Table go6 hist), this time inflation did not subsequently reignite as the economy recovered. Instead, this time inflation stayed low for a number of reasons. First, this recession was not linked with high wage rises. Instead, the rate of wage inflation going into the recession was low (3.1 per cent through 1990–91: RBA, Table go6 hist), with the main pressure on consumer prices coming from import prices following the exchange rate depreciation. Furthermore, because real wages fell, the impact from import prices washed out of the system over time. Second, the micro-economic reforms meant that competition was fiercer and employers were more likely to resist excessive wage claims as economic growth picked up. Third, the deliberate emphasis on productivity bargaining to determine wage increases meant that employers could afford to meet the aspirations of workers for an increase in living standards over time without putting their prices up to maintain their profits.

During the 1990s an important change also occurred in the role of monetary policy. The Reserve Bank first achieved *de facto* independence and subsequently, in 1996, following a change in government, the Bank achieved *de jure* independence when the new Treasurer signed a 'Statement on the Conduct of Monetary Policy'. The Bank used its increasing independence in 1993 to publicly adopt an inflation target of 2–3 per cent as the principal focus of monetary policy. From then on, monetary policy effectively provided the framework for wage negotiations, rather than the other way around as had occurred during the previous decade under the Accord. Over the 20-odd years since the 1991 recession this system has delivered an average inflation rate of 2.4 per cent per annum,¹³ while the departures outside the 2–3 per cent range have been infrequent, small, and not for long. Maintenance of this low-inflation environment is widely considered to have underpinned Australia's sustained economic growth over this period.

Another critical factor has been that there is no longer the same focus on the balance of payments, and especially the current account deficit. Prompted by academic criticism, led by Professor John Pitchford, the authorities came to accept, after the 1991 recession, that there was no particular need to intervene to reduce a current account deficit associated with an increase in private capital inflows. Since then the Reserve Bank has let the exchange rate swing quite substantially so as to act as a shock absorber in response to overseas disturbances. In particular, this approach to monetary policy allowed Australia to avoid a recession following the Asian financial crisis in 1997 and again in

¹³ Household consumption deflator: RBA, Table go6 hist.

response to the global financial crisis when the TWI fell by 26.3 per cent between October 2007 and January 2009 (RBA, Table f11 hist).

Fiscal policy continued to not figure prominently as a tool of stabilisation policy in the last two decades, the exceptions being the fiscal stimulus in early 1992 and again in response to the GFC, in 2008–09. Tax receipts were surprisingly slow to recover following the 1991 recession, but by the end of the decade revenues were growing consistently with incomes, and the Budget swung into surplus from 1997–98 to 2007–08, except for one year, 2001–02. The Coalition government also introduced a tax reform package in 2001, most notable for the introduction of a GST. This package changed the tax mix and improved economic efficiency by removing a number of small taxes that negatively impacted on taxpayer behaviour and were relatively expensive to collect. Because of the compensation arrangements, the package did not, however, affect the distribution of net taxation and the overall burden of taxation rose, with the ratio of Australian government receipts to GDP averaging half a per cent more in the five years after the tax reforms compared to the five years before (Australian Government 2012, pp. 10–16).

Productivity also grew strongly during the 1990s, with labour productivity increasing at an annual average rate of 1.9 per cent (ABS, cat. no. 5204, Table 15). The consensus view is that this good outcome reflected the micro-economic reforms before and during that decade (Fair Work Act Review 2012, p. 71). Since the mid-1990s there has been a succession of changes to the regulation of workplace relations, principally aiming to affect the balance of power between employers and unions (Borland, and Hatton and Withers, this volume). These changes, however, seem to have made little difference to the rate of productivity growth or to the rate of wage increase. Indeed, the annual rate of productivity fell to an average annual rate of increase of 1.3 per cent between 2000 and 2011 (ABS, cat. no. 5204, Table 15), while the annual rate of increase in nominal wage rates averaged 4.0 per cent in the 1990s, compared to 4.8 per cent in the 2000s (RBA, Table go6 hist).

This experience suggests that perhaps it is not so much the legislation that governs the results achieved through enterprise wage bargaining, but the willingness of the parties to explore the possibilities for trade-offs between wages and conditions and enhancements to productivity. In that respect, the unions have probably been less cooperative after 1996 than they were previously under the Accord, when, as noted, the union leadership was very aware of the need for Australia to remain competitive. Furthermore, the 100 per cent improvement in the terms of trade through the 2000s (ABS, cat. no. 5204, Table 15) allowed real unit labour costs to fall by 7 per cent (RBA,

Table go6 hist), despite lower productivity growth and an average annual increase of 2 per cent in real compensation per employee.¹⁴ A critical issue for future economic strategy will be whether the growth rate of productivity can be increased, or wage demands modified, now that the terms of trade have started to return to more normal lower levels.

Most recently, the GFC has provided a good test of the robustness of economic strategy in the face of a severe external shock, and generally the strategy pursued in Australia has proved its value, in several ways. First, the reforms to the Australian prudential system in the 1990s, plus the learning experience of the major financial institutions after the 1990 credit squeeze, meant that these institutions had much sounder balance sheets than did some of their overseas counterparts going into the GFC. Furthermore, although the Australian government did intervene at the height of the crisis to guarantee bank deposits, the government has not had to take over bank debts and recapitalise them as has happened in some other advanced economies. Second, in the decade prior to the GFC the Reserve Bank tended to modify its focus on consumer prices to take account of what was happening to asset prices as well. As a result, asset prices did not become nearly as overvalued in Australia, relative to underlying demand, as they did in other advanced economies, and house prices in particular did not fall nearly as far as they did in Australia's overseas counterparts. Third, the fiscal intervention started very quickly, within one month of the collapse of Lehman Brothers, was one of the largest packages among OECD countries¹⁵ and was estimated to have boosted growth by 2 percentage points in 2009 (OECD 2010, p. 30). In addition, the government's training initiatives meant that unemployment did not rise nearly as much relative to the decline in output, and skills were thus preserved. Finally, Australia was relatively well placed to recover quickly, as China's economic boom led to an Australian resources boom. Indeed, given the resources boom, the main criticism has been that Australian economic growth, and especially productivity growth, might have been a bit higher than the average annual rate of 0.6 per cent achieved over the seven years ending in 2010–11 (ABS, cat. no. 5206, Table 1).

In response to this criticism about Australia's recent growth record, the Labor government, elected at the end of 2007, sought to improve the supply side of the economy, and particularly productivity, by increasing the rate of

¹⁴ AWOTE of full-time adults deflated using the household consumption deflator: RBA, Table go6 hist.

¹⁵ By mid-2012 the fiscal measures were estimated to have exceeded 7 per cent of GDP (OECD 2010, p. 30).

infrastructure investment and lifting skill levels. The results achieved by that government up to when it lost office were, however, modest. Furthermore, tax revenues have failed to rise commensurate with the improvement in the economy since the depth of the GFC, and a combination of less revenue and a political promise to return the Budget to surplus has constrained the capacity of the government to pursue its policies for improved infrastructure and education and training.

Assessment

Looking back over the last 70 years since World War 2 it is interesting to consider what has changed and what has endured, and how economic strategy has evolved to meet changing circumstances.

Australia is even more closely integrated with the global economy and continues to rely on commodity exports and foreign capital inflows to finance a significant part of local investment. A key difference today has been the switch in our markets as a result of the development of a beneficial trading relationship with China and other Asian countries. However, while Asian demand has underpinned our economic growth in recent years, Australian policy – as in the past – has also had to respond to a financial crisis emanating from America and Europe.

Another major difference that has emerged is how we pursue economic stability in this increasingly globalised world economy. In the past adjustments to Australia's economic strategy used to be frequently driven by the perceived need to respond to balance-of-payments crises. This is much less the case since the Australian dollar was floated and inflation brought under control. Instead, in the last two decades quite large exchange rate movements have acted as a buffer to absorb the impact of external shocks and thus mute their immediate impact on domestic output and employment. On the other hand, the experience of the ongoing financial crisis in other OECD countries suggests that the authorities cannot afford to take a completely benign attitude to foreign borrowings, especially by the banks, as the government may subsequently be called on to guarantee these borrowings.

More generally, it would appear that the experience of globalisation has convinced many people, and particularly the policy-making elites, that relying on market instruments represents a superior way of achieving traditional goals. The framework for macroeconomic policy that has evolved now has four key elements. These are first, a market-determined exchange rate that supports monetary policy and acts as a shock absorber; second, a

medium-term inflation target implemented by an independent Reserve Bank; third, a medium-term fiscal framework implemented by the federal government; and fourth, largely decentralised wage-determination arrangements that are more likely to reflect the particular circumstances of individual industries.

Under this macroeconomic framework, an independent central bank now has 'primary responsibility for managing demand to keep the economy on a stable growth path consistent with low inflation' (Parkinson 2012, p. 9). Fiscal policy is more explicitly focused on maintaining fiscal sustainability over the medium term, and there is an expectation that discretionary changes in fiscal policy will only be used to support demand in extreme circumstances, such as during the GFC. In most years fiscal policy is primarily directed to improving the supply side of the economy and maintaining equitable outcomes. One result of this macroeconomic framework has been that the economy has been much less volatile, with fluctuations in the last decade being little more than half those experienced during the 1970s (Gruen 2011, p. 7).

This shift to increasing reliance on market instruments and refocusing fiscal policy on the supply side of the economy has also involved a change in the strategy for national economic development. In the years immediately following World War 2, the government directly intervened to encourage the development of particular industries, but as industry protection was reduced over time, the scope for such direct intervention diminished. Instead the market-oriented reforms were designed for 'arm's length' economic management, with government overseeing the economic framework within which private economic agents could prosper (Latham 2013, p. 36).

Over the last quarter of a century or so the point has been reached where in principle, at least, the strategy for national development is meant to be focused on the determinants of the supply capacity of the economy – namely population, participation and productivity (PPP). Accordingly, national development is now for the most part pursued through migration policy; education, training and work initiatives to improve participation; infrastructure development; and labour market regulation to encourage better ways of working and the associated use of skills. The expectation is that any industry assistance should be generic and directed towards increasing productivity, such as subsidising research and development.

This approach to national development reflects a considerable shift from the Australian history of much more direct intervention to influence the pattern of industry development and the highly centralised system of wage determination. When this new approach was initiated in the 1980s and 1990s,

the necessary microeconomic reforms were heavily dependent on support from broader encompassing groups, such as the ACTU. These groups achieved considerable status in their negotiations with the government and were thus able to override the objections of their more narrowly based affiliated members who represented more sectional interests (Keating & Dixon 1989, ch. 8). Moreover, these reforms, and others since, have often been accompanied by major compensation packages to 'buy' the support of those negatively impacted. For example, in the case of tax reform, almost all the extra income from new taxes, such as the GST or the carbon tax, have been returned to those most negatively impacted, and there has been no reduction in the overall tax burden.

The ongoing challenge will be to maintain the momentum of this economic strategy. The evidence overseas is that typically countries only change course when the old strategy is seen to have failed. During the 2000s, however, successive governments reassured Australian voters that the economy was performing well, and that Australians could be comfortable and relaxed. Perhaps not surprisingly, this message resulted in a falling away in the reform effort and some evidence of backsliding. For example, assistance to particular industries is sometimes still available, usually on the grounds that it is to promote necessary structural adjustment to restore the industry's competitiveness in a deregulated market economy. But this justification would be more convincing if it had the imprimatur of the independent Productivity Commission. Government regulation has also increased, and sometimes without the provision of the prescribed regulatory impact statements. And government outlays have been somewhat less tightly controlled in recent years compared with the 1980s, increasing at the same average rate as GDP between 1996–7 and 2011–12, notwithstanding that this was a long period of sustained economic growth when arguably more savings might have been made.

Given Australia's present fiscal position, it may prove difficult to fund future investment in infrastructure, technology, and human capital, while maintaining prudent financial management with higher saving. The rule seems to be that tax increases cannot be contemplated. Unless Australia improves its growth potential, however, it may prove difficult in the future to avoid some increase in the overall level of taxation, especially in a market economy that relies less on direct regulation and more on incentives, while still wanting to conform to Australian notions of social justice. Indeed, these social justice traditions have remained a powerful continuing influence on economic strategy, and our sense of entitlement may even have increased

(Tingle 2012). Most recently, in 2012, the then Shadow Treasurer called for an end to the 'Age of Entitlement', but as he noted, 'it is not popular to take entitlements away from millions of voters in countries with frequent elections' (Hockey 2012, p. 3). In particular, many policy changes that would benefit the large majority of Australians are resisted because of their negative impact on relatively small groups of people. Furthermore, Australian notions of fairness often (although not consistently) extend to accepting that these people should not be disadvantaged or, if they are, then they should be compensated over and above the normal safety net standards.

Nevertheless, the increase in Australia's social expenditure has not just been directed to compensating the 'losers' from policy changes. Indeed, there has been a deliberate attempt over the last three decades to better integrate social and economic policies to achieve a more comprehensive and effective economic strategy. In particular, a better understanding of the causes of inequality has led to the provision of a wider range of supporting services to a wider range of clients. For example, in January 1982 a single-income family with a dependent spouse and two children, earning two-thirds of average male earnings and renting privately, received only 4.4 per cent of their income from government cash transfers, compared with 27.9 per cent 30 years later in 2012. The real earnings of such a family increased by 38.3 per cent over these 30 years, but their real disposable income increased by 55.3 per cent, or almost half as much again (author's estimates). In addition, universal health-care coverage became available, and it was the improvements in the social wage through increased government outlays that most benefited low-income households (Keating & Mitchell 2000, pp. 130–5).

These improvements in the social wage reflected long-standing Australian notions of social justice whereby assistance is concentrated on the neediest. Thus, the Australian social contract supports citizens through a comprehensive safety net, based on a minimum wage and flat-rate benefits, plus incentives for private provision over and above these minimum standards. This stands in contrast to the income-maintenance provisions adopted in many other advanced economies, and as a result the Australian tax-transfer system is the most efficient among all OECD economies (Whiteford 2010). Along with Denmark, Australia redistributes most to the poorest 20 per cent of the population, but Denmark has much more 'churning' so that it taxes and spends 80 per cent more relative to average household pre-tax income than Australia does to achieve the same amount of redistribution (Whiteford 2013, p. 37).

Overall, there appears to have been a modest increase in income inequality in Australia over the last three decades, but this reflects an increase in

the dispersion of earnings, of which around 43 per cent has been offset by improvements in the tax-transfer system (Whiteford 2013, p. 39). Furthermore, this increase in the dispersion of earnings mainly reflects a hollowing out in the proportion of middle-level jobs and not a change in relative wage rates (Keating 2003). Consequently, those people remaining in the same job would not have remarked on any deterioration in their relative position. If allowance is made for expenditure patterns and changes in the cost of living, then the improvement in living standards was fastest for households in the two lowest quintiles of the income distribution between 1984 and 2011, although not in the last decade (AMP.NATSEM 2012, pp. 20–1).

At the same time, however, because much of this improvement in assistance has been tightly targeted at low-income households, this has led to rising concerns about the possibility of increasing welfare dependence, and financing the improvements has also been a continuing problem. The policy response has been to promote policies that favour more individual responsibility and which require those assisted, and who should be able to work, to either earn or learn. In addition, the budgetary consequences of the expansion in social expenditure have been mitigated by maintaining the emphasis on targeting assistance, increasing user pays (sometimes with contingent loans), and introducing compulsory superannuation and compulsory private health insurance.

Of course, all Australians are now much richer than people were 70 years ago. Indeed, in many respects Australia, like other advanced nations, has become a post-materialist society. Consequently, many Australians, although not all, are increasingly concerned about quality-of-life issues, such as the environment, in preference to accumulating even more material possessions. This change in aspirations and personal priorities has necessarily also had an impact on economic strategy.

In particular, there is now less emphasis on rapid population growth, with the total population increasing by 30 per cent in the last 20 years ending in 2011–12, (ABS, cat. no. 3101, Table 1), compared to an increase of as much 52 per cent in the 20 years between 1950 and 1970 (Maddock & McLean 1987, p. 354). Consistent with this lower rate of population growth, public capital expenditure has also declined from an average of 8.3 per cent of GDP in the 1950s and 1960s (Maddock & McLean 1987, p. 362; ABS, cat. no. 5204, Table 2) to an average of only 5.2 per cent in the two most recent decades (ABS, cat. no. 5204, Table 2). On the other hand, Australia still favours a high rate of migration to maintain reasonably strong population growth. Indeed, net migration accounted for only 40 per cent of the population increase between

1950 and 1970, whereas in the 20 years ending in 2011–12, net migration accounted for as much as 52 per cent of the population increase (Hatton and Withers, this volume).

As they have in the past, Australians continue to look to government to solve many or even most of the nation's problems. In addition, our traditions of fairness and social justice remain very strong, and economic strategy must inevitably accommodate that culture. But the changes in the last three decades suggest that economic strategy today is now much more reliant on market instruments and on institutions that are responsive to markets and allow the efficient deployment of those market instruments.

PART 6



LOOKING BACKWARDS AND TO
THE FUTURE

A statistical narrative: Australia, 1800–2010

MATTHEW BUTLIN, ROBERT DIXON AND PETER J. LLOYD

Introduction

This chapter discusses the evolution of the main official statistical collections in the period 1800–2010 and shows how we can understand the evolution of the Australian economy using those statistics. The contribution of innovative official statisticians and scholars, together with understanding the inherent limitations of the data, are two important aspects of this discussion.

Our intention is to apply a long-term, macroeconomic perspective to draw out insights that may not always be immediately evident from detailed scholarship in particular areas and time periods. We also suggest a number of areas for future research.

What we cover

To make this task manageable, we have narrowed our scope to four broad themes of economic development: scale of settlement, living standards, economic structure and openness to the international economy. Accordingly, the key measures of interest are population, GDP per capita, the industrial structure of the economy, and the openness and balance of payments of the economy. As we began to collect the data, we supplemented these core measures with others, including migration, life expectancy, labour force, participation and unemployment, prices and wages, foreign investment, and interest rates and equity returns. The data are set out in seven accompanying tables, included in the Statistical Appendix at the end of this volume; the figures presented in this chapter are drawn from those tables.

What we leave out

Narrowing the focus means the narrative has some very important gaps, some of which are addressed in other chapters.

A key gap is the economic story of Aboriginal and Torres Strait Islander people in Australia, especially the massive depopulation, expropriation of resources and falling living standards they have experienced. The statistical picture is extremely limited and subject to wide range of error for the period of initial contact between Aboriginal groups and European settlers, and is fragmentary for much of the 19th and early 20th centuries. Most of the Aboriginal population was omitted from censuses of the Australian population until the 1971 Census (which reflected the change in the Australian Constitution following the 1967 referendum) and the (non-market) output of the Aboriginal economy was similarly omitted from all estimates of early colonial GDP.¹ This seriously distorts the level and growth rate of both population and GDP estimates for Australia as a whole.

A second gap is the almost total absence of measures of the environment and its evolution over the past two centuries. This and the gap regarding Indigenous people are the flipside of successful colonisation and economic development. For most of Australia's settlement history, increases in agricultural output have been at the extensive margin, achieved by felling forests and introducing the grazing of pastures and planting of crops on land that was hunted and gathered by Aboriginal people or found unused. This displaced Aboriginal land use and resulted in the loss of many mammal, bird and reptile species; salination in some areas; the falling level of the water table in the Great Artesian Basin; the introduction of non-native animal and plant pest species; and other environmental damages. However, Australian economic historians have not endeavoured to quantify the degradation of the environment post-settlement (Harris, this volume).

A third gap is Australia's social transformation, developing from a colonial penal outpost based on convicts and agriculture into a sophisticated liberal democracy built on a federation of states and a diverse population. This complementary story is dealt with elsewhere in this volume. That said, the social transformation, the requirements of government and evolving public policies drove, expanded and reshaped the statistical collections.

Other gaps include limited time series on household time use and production, very limited data on human capital and human capital formation in the 19th century, and limited information on industrial concentration and monopoly power.

1 The experience of Aboriginal and Torres Strait Islander people is covered in the chapters in this volume by Hunter, and Altman and Biddle.

The statistical collections

An overview

A recurring theme in the growth and coverage of the statistical collections is the need for statistics to support the public policy and administrative needs of the day, especially as, successively, the dependent colonies moved to self-government, Federation established the Commonwealth of Australia, and the economic and social policy role of the Commonwealth expanded. These changes define several distinct statistical eras in the 19th and the 20th centuries during which there were major changes in the scope, accuracy and methods of the official collections.²

For example, the advent of national conciliation and arbitration in labour markets and the establishment of the Commonwealth Court of Conciliation and Arbitration in 1904 caused a large shift in the scope, quality and frequency of labour market statistics. Later, full employment and social welfare policies in the post-World War 2 period required extensive collections of national income and expenditure data, broader ranges of social indicators, and improved wage and price data in particular.

Early statistics, 1788–1822

Official statistical collections began with European settlement in 1788. The British Home Office required Governor Arthur Phillip to account for the development of the colony and particularly the need for further supplies, provisions and clothing. In addition, the power to make land grants came with the obligation to complete a regular return of grants made. Early dispatches included accounts of the size and structure of the colony's population, livestock, land grants and information on vital statistics. The statistical reporting has been characterised as being 'of the nature of documents reporting and accounting within government departments' (Forster & Hazlehurst 1988, p. 4) rather than a compilation intended as an overall description of the Australian colonies.

The first distinct period of colonial official statistics ran from 1788 to 1822 for New South Wales, and from 1804 to 1822 for Van Diemen's Land (Tasmania as it was then known). The scope of the early returns grew with expanding requests from the British authorities and the need to govern increasingly

2 We have drawn extensively on the detailed paper by Forster and Hazlehurst (1988) on Australian statisticians and the development of official statistics, the bicentennial compilation of historical statistics by Vamplew (1987, pp. xiv–xvi), ABS (1989), McLennan (2001) and McLean (2005).

complex colonies with mixed penal and market-based economies. Forster and Hazlehurst (1988, p. 4) note areas of statistical collections: population, the Commissariat (which provided the supply of stores to the penal economy and developed as ‘the main market for local produce and the main retail outlet for supplies’), vital statistics (including marriages, births and deaths) and agricultural statistics. Information was also collected on materials relevant to a maritime empire, including timber and forests, and on international trade, customs revenue and land grants, and was supplied to the relevant Departments of State in Britain.

Data accuracy varied considerably, and specific data points from this early period are, in general, not to be relied on. Key data collections often depended on inaccurate methods of enumeration; some were irregular; and some statistics were collected over a period of days rather than a single day. For example, the early population estimates came from ‘musters’, which were assemblies of population at specific locations on particular dates for the purpose of enumeration by the governor’s officials, magistrates or other designated means. They were also an occasion for collecting other statistical information, including livestock numbers.³

Despite various attempts by colonial authorities to improve the effectiveness of the musters, overall they contain significant and varying inaccuracies. This was known at the time: the population was increasingly widely dispersed, which meant aggregate figures underestimated the true position. At the same time, the musters included double and triple counting because some individuals presented for counting at several locations and thereby obtained extra rations from the Commissariat. On the occasion of the 1820 muster, ‘Governor Macquarie found the returns so inaccurate he felt unable to send them to England’ (Forster & Hazlehurst 1988, p. 3).

From these official data scholars have made estimates from 1788 onwards for, among others, population, current GDP, and exports and imports. Supplementary sources of information include the court records and embarkation information of convicts, which provide some indication of occupation and hence skills of the transportees.

A great many statistics are absent from this early collection – for example, labour market data such as labour force, employment, wage rates, prices, skills and participation. Some attempts have been made to develop estimates of the workforce, employment and occupation profile for the early period

3 Caldwell (1987, p. 25) provides estimates of the colonial population from 1788 to 1825 based on the musters.

(see, for example, the five-yearly projections of colonial labour supply in Butlin 1994) but accuracy is limited.

*Before self-government: colonial Blue Books
and censuses, 1822–55*

In 1822 the British Colonial Office introduced the annual Blue Book system to the Australian colonies as part of continuing reforms of the empire-wide administration of the colonies. This annual compilation was intended to assist the Colonial Office in its administration of the colonies, especially in reporting the extent and use of financial resources. Annual Blue Books were produced for both New South Wales and Van Diemen's Land starting in 1822, for Western Australia from 1834 onwards and for South Australia from 1840 onwards (*Statistical Returns for the Colony of New South Wales*, various dates).

Initially, the Blue Books focused on the cost of the colonies, with the five main areas covering net revenue and expenditure, taxes, military expenditure, establishment and schedule of fees (Forster & Hazlehurst 1988, p. 6). Additional information was required on population, exports and imports, and currency.

Over time, and driven by the needs of the Colonial Office, their scope broadened. From 1828 onwards the New South Wales returns included education, agriculture, manufactures, mines and fisheries, land grants, and gaols and prisoners. They were supplemented by other collections specifically designed for local administration, such as the *Statistical Return of Van Diemen's Land for the Years 1824 to 1835* prepared at the direction of Governor Arthur (Forster & Hazlehurst 1988, p. 11).

Contemporary accounts of British authorities indicate the Blue Books were initially regarded as very unreliable, but by the mid-1830s the assessment had changed to the data being generally very good. The accuracy of some statistics, however, remained problematic, notably annual statistics of births and deaths (where coverage was incomplete) and agriculture, which relied on the police force for collection.

The first population census took place in New South Wales in 1828. Information was collected on the number of members in a household, names, sex, age, occupation, place of residence, religion and housing, and the numbers of cattle and cleared and cultivated land. The information was considered to be of questionable reliability in part because respondents were suspicious of the motives of the authorities in conducting the census and participation was not mandatory. Further New South Wales censuses followed in 1833, 1836, 1846 and 1851, and provided information on the future Victoria

and Queensland, both of which were then part of New South Wales. Van Diemen's Land held censuses in 1842, 1843, 1848 and 1851; South Australia's censuses in this period were in 1841, 1844, 1846 and 1851. Victoria conducted one census in 1854, before self-government in 1855.

The censuses provide an increasingly accurate and more detailed picture of the colonial population in terms of age, gender and religion, together with skills, occupation and housing. However, there was little coordination among the colonies on the timing of their individual censuses, limiting their value in measuring the colonial population of Australia.

By the middle of the 19th century the official statistics for Australia – Blue Books, censuses and ongoing reporting from the colonies to individual Departments of State in Britain – provided (by contemporary imperial standards) a reliable and useful body of information to assist the administration of the colonies. Scholars have used these sources to broaden the statistical description of the Australian economy beyond the rudimentary picture available before the Blue Books. The additional information includes, among other things, greater detail on industrial structure and output, prices, demographics, exports and imports.

Self-government to Federation, 1855–1900

In 1850 the British parliament enacted the Australian Colonies Government Act, which granted representative constitutions to the colonies. Self-government came in 1855–56, and created a requirement for statistics to support efficient public administration by the individual colonies. This need was served by a succession of able statisticians, namely W. H. Archer (Victoria, appointed 1853), H. H. Hayter (Victoria, appointed 1874) and especially T. A. Coghlan (New South Wales, appointed 1886), and a healthy dose of inter-colonial rivalry. The upshot was a succession of innovations in the coverage, practice and interpretation of official statistics that gave Australia an international reputation for excellence.

Three main phases may be distinguished. The first, from roughly 1853 to 1861, saw Archer make a large change in the breadth, quality and consistency of Victoria's statistics. He added new material, including expanded vital statistics, and greater detail on foreign trade, wages and prices, manufacturing employment, and railways. He also greatly improved the methods by which the statistics were collected, especially vital statistics and agricultural statistics. In 1861 Archer also established the reporting format and organising framework for the annual Statistical Register, which remained for the rest of the century and set a standard that other colonies emulated.

The second phase saw attempts to standardise statistical reporting, methods and formats, and greater coordination in censuses among the colonies, including timing and content. The second phase also saw the publication of the first Year Book, undertaken by Hayter for Victoria in 1874. Apart from its new format, the Year Book broke new ground by incorporating interpretation and also providing some inter-colonial comparisons. Greater coordination was achieved in censuses, with the 1881 Census being held on the same day in all colonies and the Northern Territory. However, it was not until the 1891 Census that full consistency was achieved, including a common core of questions, a common day and a uniform principle for compiling the returns.

The third phase dates from the appointment of Timothy Coghlan in 1886 as the New South Wales Government Statist, a post he held until 1906. Coghlan's contributions to the measurement and interpretation of Australian economic development were enormous, and he was the first colonial statistician to achieve an international reputation as an outstanding innovator and interpreter of statistics. He reorganised the New South Wales Statistical Register; improved the quality and scope of New South Wales statistics, including those on industrial wages; and began the New South Wales Year Book by publishing *The Wealth and Progress of New South Wales, 1886–87*. Coghlan was also a principal leader in encouraging the adoption of common frameworks, measures and concepts in the statistical collections of the Australian colonies.⁴

Coghlan applied his very high capacity for historical and economic analysis in the official New South Wales publications for which he was responsible. In 1890 he began an annual publication covering all the colonies of Australia and New Zealand, titled *A Statistical Account of the Seven Colonies of Australasia*. Between the New South Wales Year Book and this new publication, Coghlan eventually provided estimates of national income by industry for New South Wales in 1886, 1887, 1889, 1891, 1894 and 1898, and Australian national income for all colonies and Australia in 1899, 1901, 1902 and 1903. Under instructions from the Commonwealth Minister of Trade and Customs, Coghlan also produced the first two annual Overseas Trade volumes, those for 1903 and 1904, which recorded the details of Australian commodity exports and imports. These also contained the first estimates of average tariff rates on dutiable imports and all imports.

Coghlan's contributions continued after his term as New South Wales Statistician finished in 1906, culminating in the publication in 1918 of *Labour*

4 Hicks (1981) provides a short account of Coghlan's life and achievements.

and Industry in Australia in four volumes. This document provided the first great economic history of Australia, covering the period from European settlement to the creation of the Commonwealth.

By the end of the 19th century, Australia's official statistical collections were broad in scope, of high quality and at the leading edge of statistical measurement internationally. The period from 1861 onwards, marked by the census of that year, represents a step change from the preceding colonial period in the capacity of scholars and researchers to analyse, reliably, the statistical patterns of economic and social development. That is not to say the statistical picture was complete by today's standards: there remained important gaps in the official statistics such as regular estimates of the conditions of Aboriginal Australians, household expenditure, unemployment, earnings and prices.

Commonwealth statistical collections, 1901–1948

The advent of the Commonwealth of Australia meant new institutions were created to support and assist the new national government. They included the CBCS, established in 1905 with G. H. Knibbs the first Commonwealth Statistician. The CBCS was authorised to collect statistics on population, vital statistics, social and industrial matters, employment and non-employment, exports, imports, interstate trade, factories, mines and productive industries generally, primary industries, banking insurance and finance, transport, land tenure and other matters prescribed by the Minister (Forster & Hazlehurst 1988, p. 48). The Commonwealth Statistician was given powers to obtain information, and confidentiality was required from employees of the CBCS. These latter provisions reflected the practical challenges faced by colonial statisticians that, as noted previously, had limited the quality of many statistics.

Two key early priorities were to adopt common concepts, frameworks and methods to the statistics of the states and the Commonwealth (federal government), and to establish effective relationships between the federal and state statistical bodies. Under Knibbs the CBCS produced federal annual Year Books from 1908 onwards; standardised states' statistical returns; expanded national collections of population, prices, wages and industrial disputes; conducted a survey of income and expenditure; and conducted the War Census in 1915. This unique census arose from the wartime need to understand the country's manpower resources, value of private wealth (including land, improvements, machinery and plant, and financial assets) and net income.

The growth in the labour market measures was prompted by, and helped the work of, the Commonwealth Court of Conciliation and Arbitration. The increase in scope and quality of these data can be seen in the Vamplew (1987) compilation, particularly in the chapters on labour; marriage, fertility and mortality; and prices and consumption.

The interwar depression was triggered by a combination of the global economic depression, high foreign borrowing by the public sector and the fall in Australia's terms of trade in the late 1920s. Managing the emergency called for, among other things, better and more timely measurement of the balance of payments, foreign borrowing, international reserves and debt-servicing obligations. Major improvements in statistics on Australia's trade and external position were driven by Roland Wilson (who became Commonwealth Statistician in 1936, following L. F. Giblin), first appearing in the 1934 Commonwealth Year Book. The times also required better information on social conditions, and led to attention in the 1933 Census on unemployment and income, particularly for low-income earners, and dependent children. Further improvements were made to retail price indices, with the C series retail price index being introduced in 1938. This index was adopted in due course by the Arbitration Court in its deliberations on the implications of the cost of living for wage determination.

The need for better measures of economic conditions also prompted the Commonwealth Bank to publish a range of statistics on banking, prices, trade, bankruptcy and selected industries (Forster & Hazlehurst 1988, p. 70). The Reserve Bank's Statistical Bulletin, combining data and interpretation, is a descendant of this early effort.

Commonwealth statistical collections, 1948–2000

The immediate postwar period saw the adoption of economic stabilisation policies aimed at achieving full employment. The information needs of macroeconomic management stimulated the next major expansion in the core measures of economic development – a full set of national income, expenditure and production accounts. Throughout this period the CBCS, subsequently renamed the Australian Bureau of Statistics, maintained and expanded the core information collected through the censuses.

The first CBCS census of retail trade was undertaken in the late 1940s. Official estimates of national income and expenditure started from 1948–49, following prototype estimates for the period 1938–39 to 1947–8, and covered all the major expenditure aggregates in current and constant prices.

The large gap before 1938–39 was covered selectively, and not on a continuous, consistent basis.

In the early 1960s quarterly estimates of national income measures were added, increasing the information available to policymakers concerned with economic stabilisation. Household expenditure surveys and labour-force surveys provided from 1960 onwards a new source of activity-based labour-force data, and supplied frequent and consistent measures of labour-force participation, occupation, employment (including employment by industry) and unemployment. The survey provided an alternative direct measurement of unemployment to the number of persons registered as unemployed with the Commonwealth Employment Service. In 1978 the labour-force survey went to a monthly reporting cycle. The 1960s also saw the development of the flow of funds tables by the Reserve Bank, which showed patterns of saving by sector.

By the late 1960s the official macroeconomic statistics allowed a range of econometric models to be estimated and used in policy advice and formulation by the Commonwealth Treasury and the Reserve Bank of Australia. The development and publication by the ABS of input–output tables in the 1960s (with the first year measured being 1958–59) underpinned the pioneering development in the 1970s of computable general equilibrium models by Monash University, assisted by the Commonwealth Industries Assistance Commission (IAC) and other agencies.

The decades following the 1970s saw further expansions of the official statistics collected by the ABS. In 1984 the ABS began a household expenditure survey providing information on expenditure patterns by type of household. The labour-force survey was used to investigate questions of specific policy interest, such as measuring expenditure by businesses on training and development of employees as part of the introduction of the Commonwealth Training Guarantee in the early 1990s. Other agencies collected important official statistics, such as Customs and the Commonwealth Employment Service.

The IAC (formerly the Tariff Board and later the Productivity Commission) in particular was a key contributor to the policy debates on industrial structure and the role and extent of international competition in the Australian economy. It collected information on rates of industry protection and developed estimates of effective rates of protection based on concepts developed by W. M. Corden. Lloyd and MacLaren (2013) have used statistics on tariffs and other industry assistance to measure the average nominal rate of assistance to the agriculture and manufacturing sectors since Federation.

Another feature of the later period has been the development of a number of longitudinal statistical collections, including the Australian Longitudinal Survey and the HILDA surveys. These statistics have been compiled by academic economists with strong support from the federal and state public-sector policy users of the information.

Gaps, challenges and statistical ‘backfilling’

Gaps and challenges

What, then, does the evolution of official statistics mean in understanding the statistical picture of the economic development of Australia? There are several dimensions to our answer.

First, there are the matters of *what* was measured and *how* it was measured, focusing on accuracy, reliability and consistency. The requirements of local administration and public policy drove what was measured, and they changed over time. What was appropriate for a penal colony, focused on numbers of people dependent on the Commissariat and on supplies from Britain, was quite inadequate for the self-governing colonies of the 1860s in terms of scope, detail and accuracy, notwithstanding the improvements brought about by the Blue Books. It is hardly surprising that the scope of collections broadened markedly, and there was a step change in the reliability and accuracy from colonial self-government and, later, Federation.

A particular challenge for scholars of Australia’s economic development is that two key decades, from 1840 to 1860, contain significant gaps in measuring incomes, labour-force experience and external linkages. Also, the measurement of GDP in later periods is a matter of some controversy and the absence of reliable, continuous household expenditure data before Federation prevents the estimation of expenditure-based national income.

Second, there is the fundamental matter of what these indicators *mean*. In just over 200 years a tiny penal colony lodged in a far larger Aboriginal economy evolved into the sophisticated, open and resource-biased economy of today. A particular case in point is the early colonial labour market. Participation in the labour market in a penal economy with, among other things, its assignment of convicts to settlers, and how to value the labour supplied by convicts, are more complicated concepts than labour market participation in the market economy of the late 19th and early 20th centuries. This matter is particularly important for measuring national income for Australia before 1825.

Overall, the caution by Noel Butlin, Jules Ginswick and P. Statham (1987, p. 452) against ‘unduly simplistic interpretation of the statistical record’ for the pre-1850 economy seems highly appropriate. Moreover, Noel Butlin (1986b) warned that ‘the construction of social accounts, of measures of gross domestic product and of the components of the economy, is a high risk undertaking for this early period (1788–1860)’.

That said, economic historians have used available sources to construct estimates of, among other things, national income accounts, population, labour force and incentives shaping Australia’s industrial structure to enable a broad, statistical picture to be developed. We cover these areas in the following section.

Backcasting statistical concepts using official statistics

Population and labour force

Estimates of colonial settler population, including by gender, were provided annually from 1788 onwards. The biggest accuracy problems relate to the period prior to 1840, before the widespread adoption of censuses. The dependence of the early population data on different methods for conducting colonial ‘musters’ means the early data (i.e. from 1800–25 onwards) contain significant inaccuracies. Population is better measured from the 1828 and subsequent censuses and the colonial authorities considered the Blue Books were reliable by the mid-1830s.

Migration statistics were probably accurate in gross terms, but not in net terms until the mid 19th century. Marriages and births were inaccurately measured in the early years, partly because the population was widely dispersed and the data were erratically collected by the clergy. From the 1860s onwards Knibbs and others significantly improved the accuracy of vital statistics (especially the Victorian figures).

Labour-force and participation rates may be measured from census points back to 1841. Noel Butlin (1994) made five-yearly projections of the labour force based on the muster and census information for the period 1800–50. Censuses from 1841 onwards have been used to estimate labour-force size and participation (Vamplew 1987; Withers, Endres & Perry 1987). More reliable annual labour-force data are available for the 20th century in M. W. Butlin (1977), covering 1900–01 to 1960–61 (based on Keating 1973 for 1910–11 to 1960–61) and from the ABS thereafter. Unemployment rates are available from 1861 to the present. The period to 1890 is not reliable other than for census years; there is a need to fill this gap.

National income and GDP

Estimates for GDP exist from 1788 to the present in current prices, and from 1800 to the present in constant price terms. The main sources are Butlin (1986b) and Butlin and Sinclair (1986) for nominal and real GDP in the years 1828–60, and for nominal GDP during 1800–28. Snooks (1994) estimated real GDP from 1800 onwards. The data for the period 1800–40 are necessarily very imprecise, being based on a mix of primary source material and some necessarily tenuous technical assumptions. Butlin (1986b), however, suggests the biggest measurement issues arise for 1825–40 when the rapid expansion of the colonies meant a loss of control by the colonial authorities and accurate measurement was made difficult.

The period 1861 to 1938–39 is partly or wholly covered by several sets of estimates. Coghlan (1918) and Clark and Crawford (1938) estimated national income based on several methods and for a selection of years in the late 19th and early 20th centuries. Butlin (1962) made annual estimates of Australian domestic product, investment and foreign borrowing for the whole period, using consistent sources and methods to estimate GDP using the production method, with a clearly documented approach. These estimates, while subject to criticism for some aspects of methods, assumptions and price deflators in the 19th century, underpinned a reinterpretation of Australia's late 19th-century economic development.

Haig (2001) made an alternative estimate for GDP from 1861 to 1948–49 using new information and provides a different picture of economic development during 1861–1930 and of living standards during the 1920s. McLean (2004, 2005) and Maddison (2006) have provided an assessment of the data series. Following Maddison (2006), we have used Noel Butlin's estimates for real GDP for 1861–1911 (adjusted to bring them into line with 20th-century definitions, most importantly to remove livestock accumulation) and Haig's estimates for 1911–39. Snook's (1994) estimates cover the years 1800–28.

M. W. Butlin's (1977) annual database for 1900–01 to 1973–74, which was compiled for econometric modelling purposes at the Reserve Bank of Australia, covers GDP, expenditure aggregates, capital stock, workforce, unemployment, finance, interest rates and the balance of payments. Haig and Anderssen's (2007) direct estimates of private consumption expenditure for 1900–01 to 1938–39 are a distinct improvement over M. W. Butlin (1977) and enable true expenditure-based estimates of national income for 1900–01 to 1938–39.

Industry structure

The methods for estimating GDP for the 19th century mean estimates of industrial product exist from 1800 onwards in constant prices and from 1788 onwards in nominal prices. The same caveats apply for gaps and data as for the measurement of GDP.

Openness to international trade

Estimates for exports and imports in current prices for 1825–50 come from individual colonies' Blue Book returns reported in Vamplew (1987) and for 1851–60 directly from the Blue Books. These estimates may be regarded as reasonably reliable. For 1861–1900 estimates of exports and imports came from Butlin (1962) and from M. W. Butlin (1977) for 1900–01 to 1973–74. Thereafter, the estimates come from the ABS.

The measure of openness is the ratio of the sum of exports and imports in current prices to GDP in current prices. This ratio is available from 1825 onwards.

Estimates of Australia's terms of trade combine Bambrick (1970), M. W. Butlin (1977) and ABS data, and cover the period 1870–2010. Additional estimates of export prices for the years 1860–70 are in Vamplew (1987), but not import prices.

Tables and graphs

Following the statistical narrative, we have compiled from various sources long-run data series for some variables measuring key aspects of the macroeconomy over two centuries. We graph these series to gain a new perspective on some issues. Graphs are a vehicle of discovery as well as a way of communicating the data. Furthermore, simple transformations such as the use of log scales and the plotting of year-on-year changes reveal patterns that are not readily evident in the tables. We comment only selectively on some features of the performance of the macroeconomy that show up in these graphs. The graphs and commentary are arranged under headings denoting our four broad themes of economic development.

Scale of the macroeconomy

The Australian population has grown continuously since 1800. The rate of growth peaked in the gold rush of the 1850s, and there is a clear break in the series around the end of the period, with lower growth rates persisting

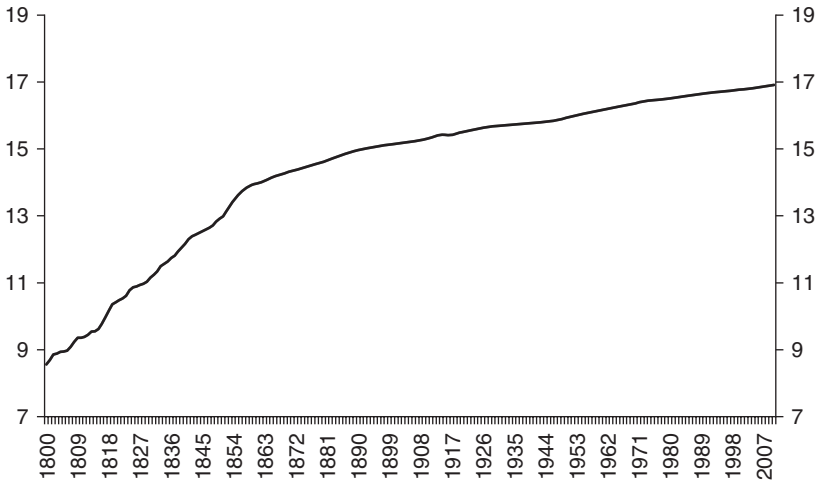


Figure 21.1 Population, 1800–2010 (log, 31 December of year indicated)

Source: Statistical Appendix, Table A2.

afterwards (Figure 21.1). The sex ratio exhibits two early spikes, around 1800 and 1825, with the decline thereafter halted briefly by the gold rush (Figure 21.2). The impact of World War I is noticeable. Net migration as a share of annual population increase is highly volatile. There is a suggestion of correlation between net migration and business cycles as well as wars. The dips in this time series seem correlated with the early 1840s, the end of the gold rush, the depression of the 1890s, the Great Depression and World Wars I and II. The proportion of the Australian population born overseas fell for 80 years following the 1861 Census but has continued to rise steadily since the late 1940s (Figure 21.3). Immigration has remained an important determinant of our demographics.

Similarly, Figure 21.4, which plots the log of real GDP data series, shows the pattern of sustained long-term growth in aggregate output that is now well known. However, the rate of growth is somewhat erratic as it has been interrupted by periodic business cycles, growth spurts, wars and other shocks. Figure 21.5 plots the year-on-year growth rates of real GDP. Figure 21.6, which plots the moving 10-year variance of growth rates, together with Figure 21.5 exhibits two periods of moderation. The first occurred after the gold rush and the second from around 1960 to the present time. The presence of the two moderations and their respective explanations merits further research.

The 1850s gold rush is a watershed for Australian economic development. It was both an endowment shock for the economy in population

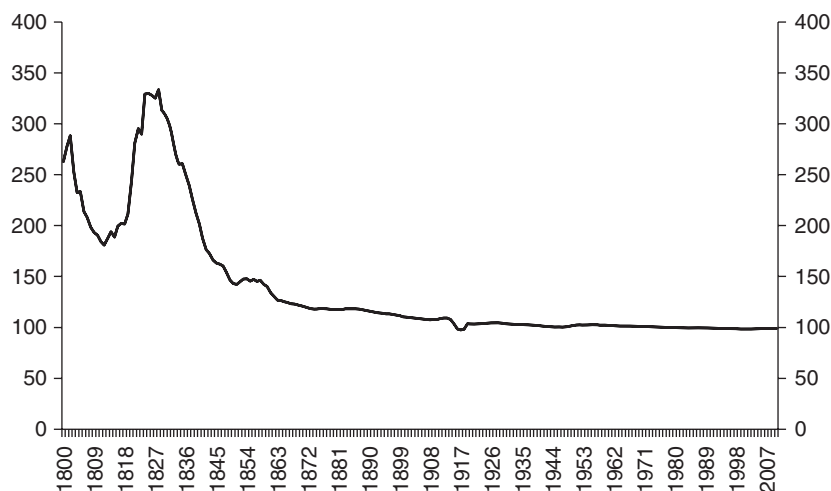


Figure 21.2 Sex ratio, 1796–2010 (number of males per 100 females)

Source: Statistical Appendix, Table A2.

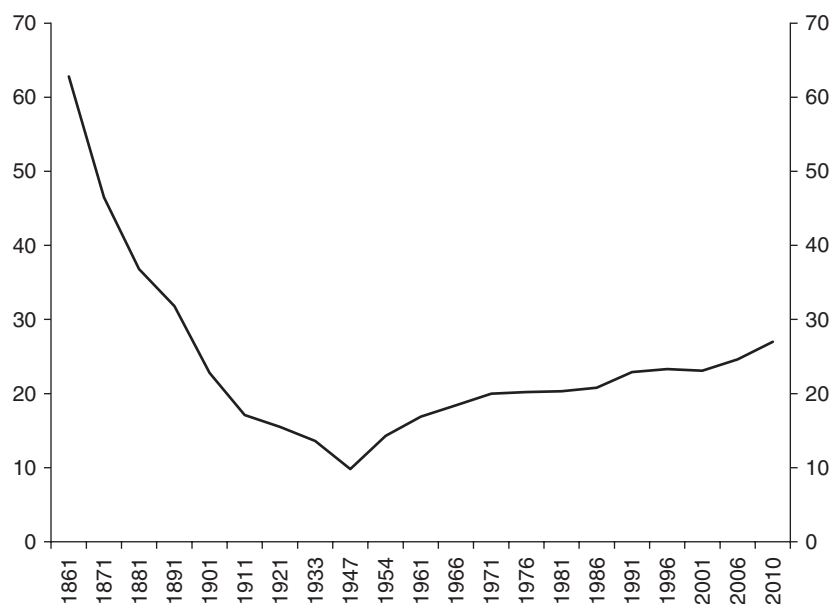


Figure 21.3 Proportion of the Australian population born overseas (%), 1861–2010

Source: Statistical Appendix, Table A2.

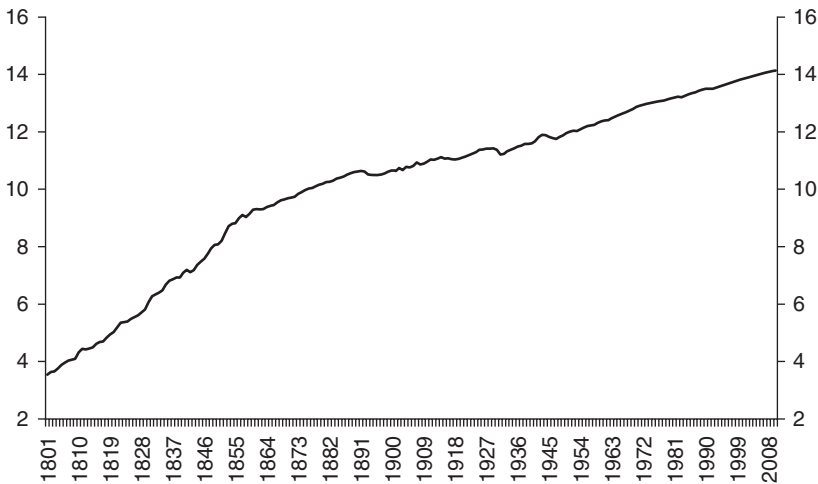


Figure 21.4 Real GDP, 1800–2010 (log)

Source: Statistical Appendix, Table A1.

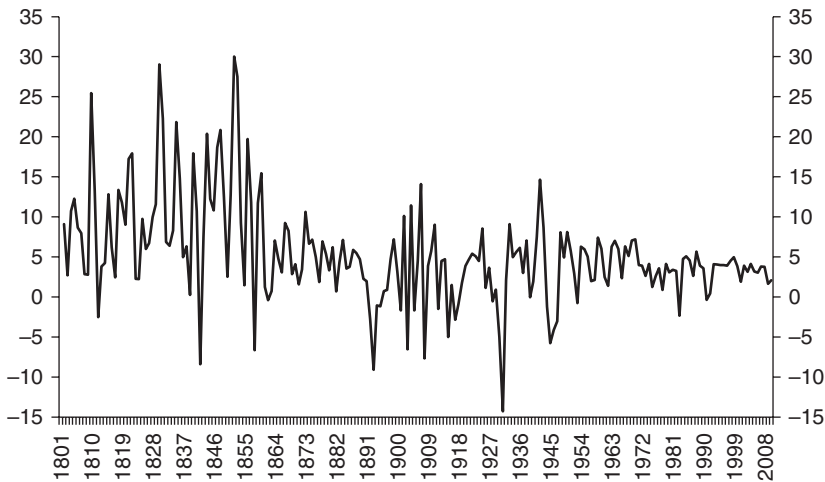


Figure 21.5 Year-on-year growth rate of real GDP (%), 1800–2010

Source: Statistical Appendix, Table A1.

and wealth, and an inflection point where economic growth shifted to a slower and sustained rate. Its impact is also reflected in other time series – for example, the share of net migration in population increase and the sex ratio.

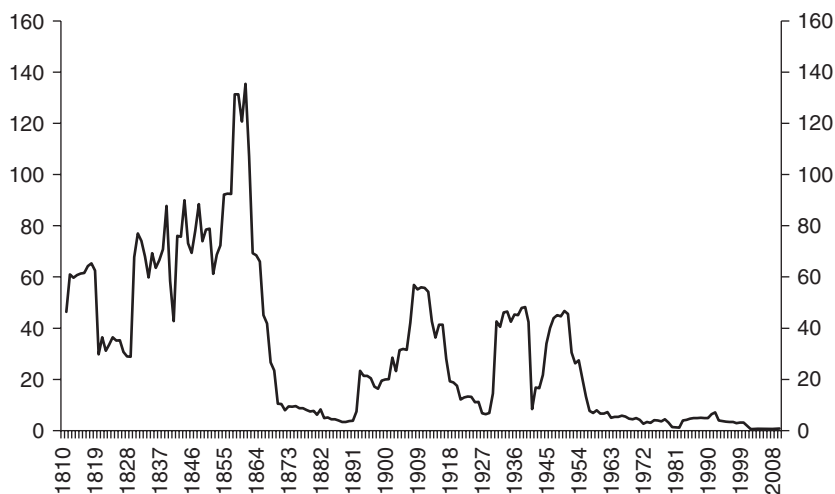


Figure 21.6 Rolling volatility, 1800–2010 (moving 10-year variance of growth rates, %)

Source: Statistical Appendix, Table A1.

The gold rush has been compared to the resources boom of the early 21st century. While there are some strong similarities – a shock from mining that has driven investment and real incomes – the differences are important. The most obvious is scale. At the peak of the gold rush the mining sector was nearly half of Australia's GDP (Figure 21.7), and Coghlan (1918) estimated the value of gold production at around two-thirds of GDP, compared with mining reaching around 10 per cent of GDP in 2010.

Moreover, the transmission mechanisms are different. The gold rush was an endowment shock in which discoveries of currency and rapidly imported labour under conditions of a fixed exchange rate rapidly – and largely exogenously – expanded the Australian colonial economy's resource endowment. This contrasts with the early 21st-century terms-of-trade shock (Figure 21.8) that had its roots in sustained economic development in China and India and stimulated the exploitation of known natural resources and raised the real exchange rate.

Living standards

The log of real GDP per capita is plotted in Figure 21.9. This too shows sustained growth but with periods of decline in business cycles, which were more pronounced in the 19th century than during the Great Depression. Real wages also grew in a broadly similar pattern to real GDP per capita, although

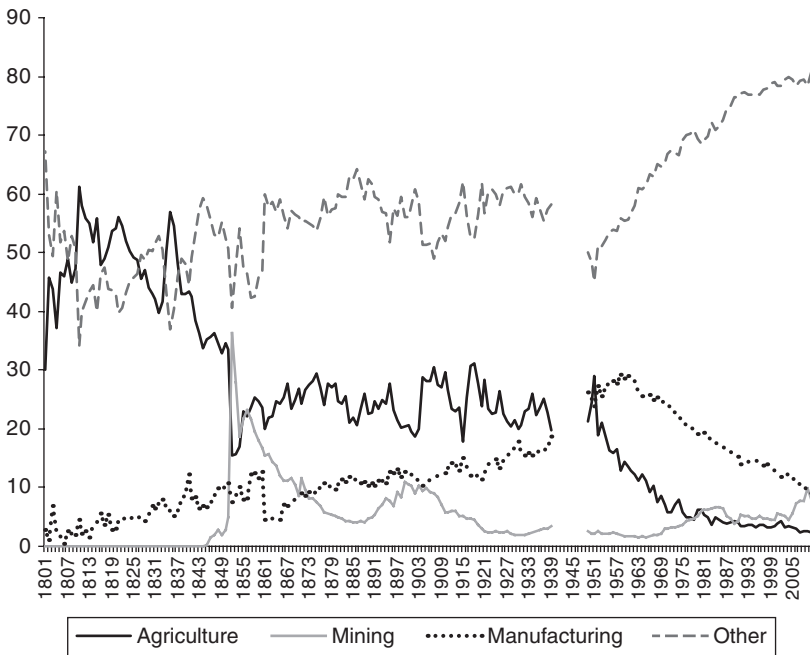


Figure 21.7 Industry shares of GDP, 1800–2010 (%)

Source: Statistical Appendix, Table A1.



Figure 21.8 Terms of trade, 1871–2010 (ratio, 1966–67 = 100)

Source: Statistical Appendix, Table A3.

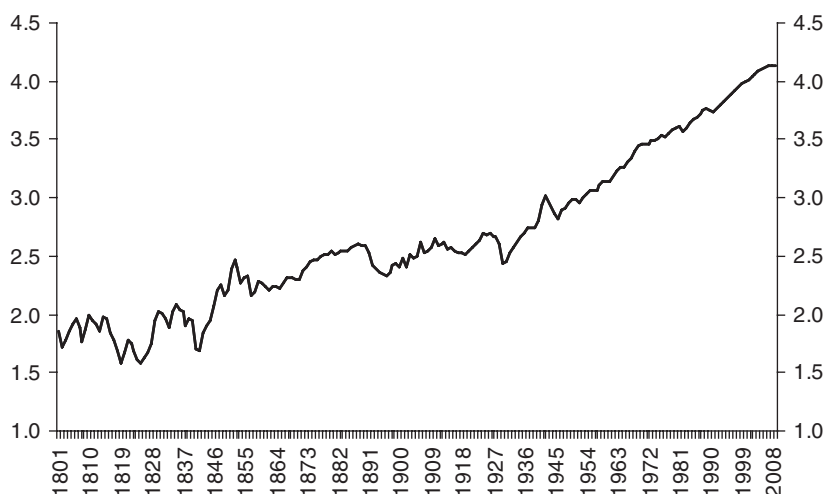


Figure 21.9 GDP per capita, 1800–2010 (log)

Source: Statistical Appendix, Tables A1 and A2.

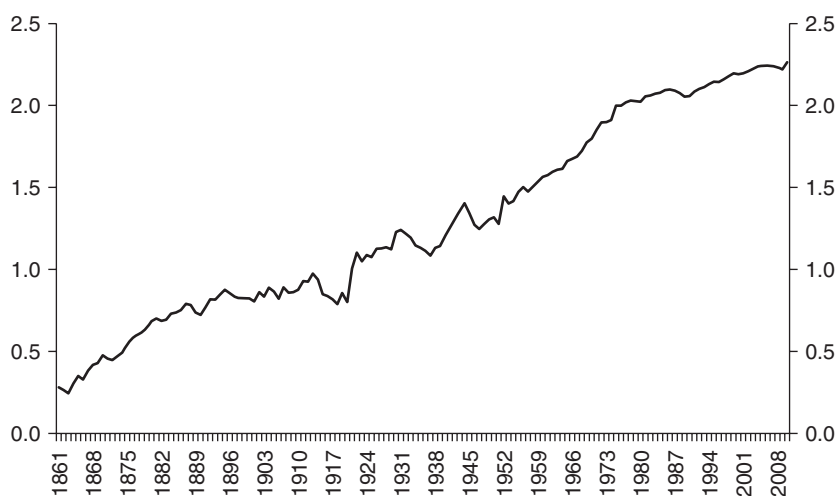


Figure 21.10 Real wage rate, 1861–2010 (logs, GDP price deflator)

Source: Statistical Appendix, Table A7.

the available data start in the late 19th century. In addition, wartime inflation between 1914 and 1919 reduced real wages for a time (Figure 21.10).

Variation in the unemployment rate (Figure 21.11) reflects mainly the impact of major business cycles. The big spikes occurred in the 1890s

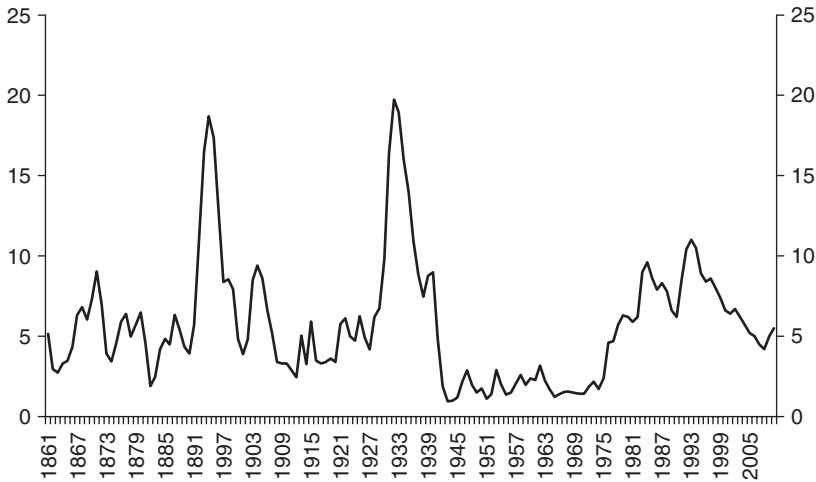


Figure 21.11 Unemployment rate (%), 1861–2010

Source: Statistical Appendix, Table A2.

depression and the Great Depression. Unemployment peaked at around 18 per cent in 1895, just short of the peak of the 20 per cent reached in 1932 in the depression of the 1930s. Given the limitations of the data series, there may be little difference between the severity of the two episodes.

Structure of the economy

Figure 21.5 shows the story of the changes in the structure of the Australian economy since colonisation. From 1800 to 1850 agriculture dominated the Australian economy. Mining was a miniscule contributor until the discovery of gold in 1851 (although early New South Wales coal mining is not captured in the statistics).

Manufacturing steadily increased in importance over time to peak at 29 per cent of GDP in 1961. Applying the contracted 1971 definition of manufacturing to the 1960s official data brought this turning point forward to a few years earlier than Boehm's prior (1972) calculations. It has declined steadily since then. Lloyd and MacLaren (2013) estimated the average nominal rate of assistance to the agriculture sector from a range of measures for the period 1903–04 to 2003–04. It can be compared to the average nominal rate of assistance to manufactures. These two series are combined in a single measure of the relative rate of assistance to manufacturing (Figure 21.12). It shows that throughout the century

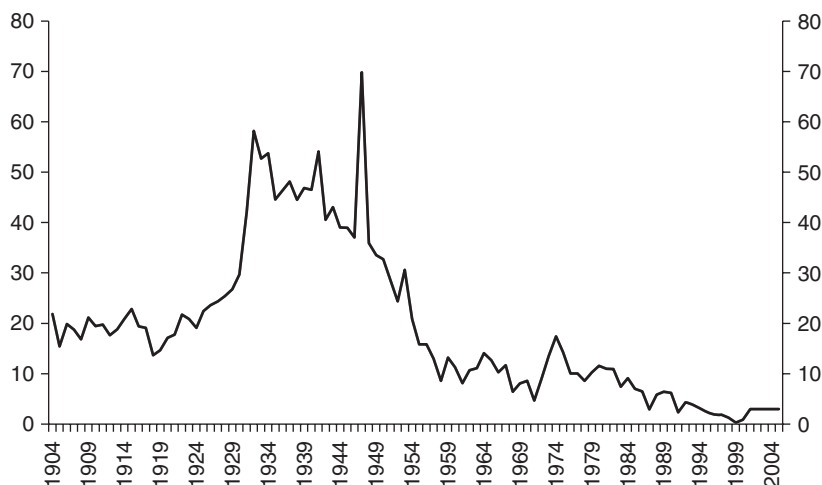


Figure 21.12 Relative rate of assistance to manufacturing (%), 1904–2004

Source: Statistical Appendix, Table A4.

to 2003–04, government intervention in the form of direct assistance to producers favoured the manufacturing sector and discriminated against the agriculture sector. These levels of assistance to manufacturing affected significantly the sector's share of output. After World War 2, manufacturing substantially increased as a proportion of the economy under protectionist policies of tariffs, quotas and subsidies, reaching a peak around 1960 and then falling in a trend that has continued to the present day. Throughout the post–World War 2 period the share of the services sector has risen steadily (Figure 21.7).

Openness

While Australia is often described as an open economy, we need to distinguish between openness with respect to trade in goods and tradable services, acceptance of immigrants from other countries, and capital inflows.

The graphs of the share of net migration in population increase and of the current account balance relative to GDP show that Australia has received net immigrants (Figure 21.13) and capital inflows (Figure 21.14) in all decades since these series began (1837 and 1861 respectively), with no clear trend in either series. Over these long periods, net migration has averaged around 35 per cent of annual population increase and the current account deficit has averaged 2.9 per cent of GDP.

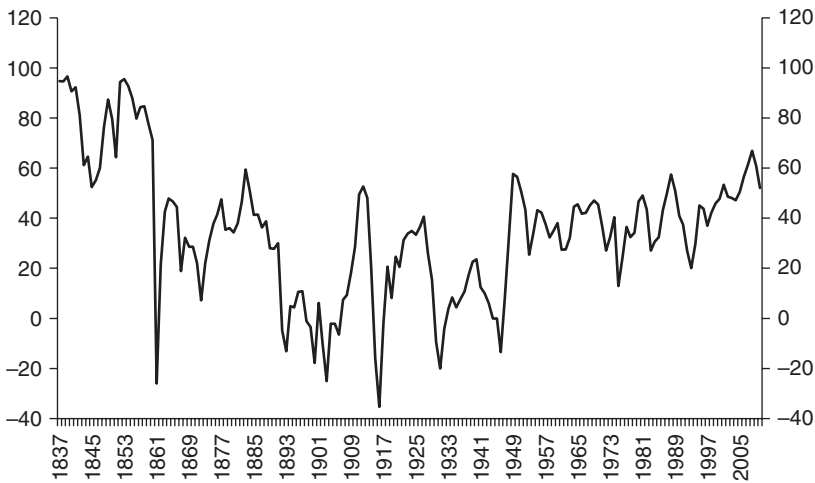


Figure 21.13 Share of migration in population increase (%), 1837–2010

Source: Statistical Appendix, Table A2.

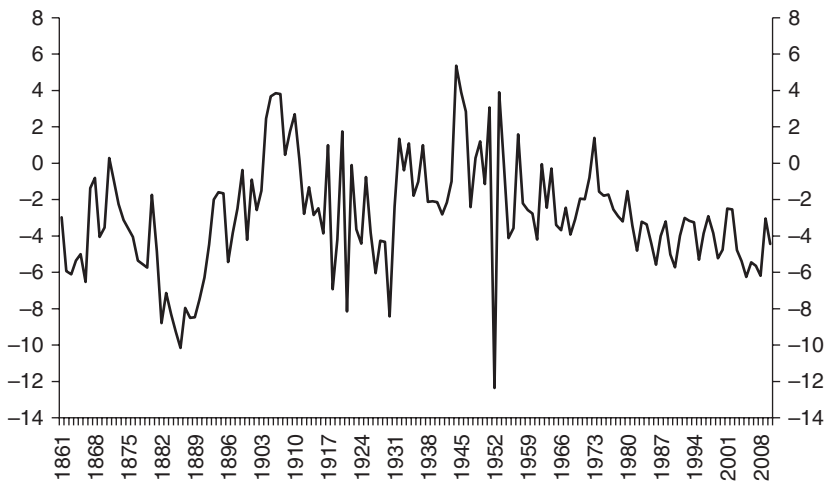


Figure 21.14 Ratio of current account balance to GDP (%), 1861–2010

Source: Statistical Appendix, Table A3.

In contrast, openness with respect to goods trade has varied much more over time. Openness, as measured by the ratio of exports plus imports to GDP, was higher in the three decades of the 1830s, 1840s and 1850s than in any subsequent period (Figure 21.15). It is also affected by government policies.

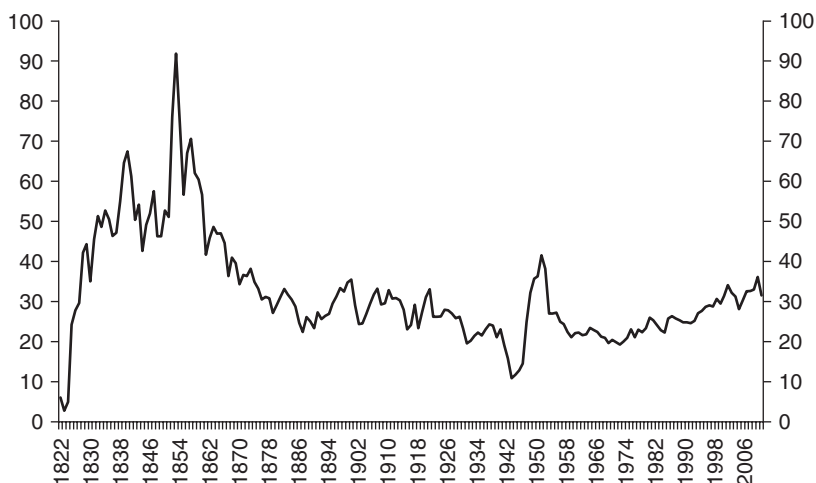


Figure 21.15 Openness of economy, 1822–2010 (ratio of exports plus imports to GDP, current prices, %)

Source: Statistical Appendix, Table A2.

The Australian economy has become much more open to goods imports since the average nominal rate of assistance to manufacturing, which is almost entirely an import-competing sector, has been lowered from the early 1980s.

Trading goods and services with other countries has exposed tradable industries to fluctuations in world prices. Figure 21.8 shows the terms of trade for goods. The spike in this series during the current mining boom period is pronounced but it is almost matched by two earlier spikes in the early 1920s and again in the Korean War period.

Conclusion

More research is needed on many of these statistical aspects of the economy, such as the long-run evolution of the business cycle in Australia and the moderation in some data series. Research is also needed on relationships among the variables in these series.

Finally, we observe that recent trends that are the focus of much current debate, such as the scale of business cycles, pale into relative insignificance once a two-century perspective is applied. Economic growth and development and the consequent improvements in levels of consumption are remarkably consistent, despite turning points in the growth of population, GDP, investment and productivity.

Wealth and welfare

MARTIN P. SHANAHAN

Introduction

'Men do not emigrate in despair, but in hope' (Hancock 1930, p. 39). As a nation of immigrants there can be few other countries where the popular sentiment has placed as much hope in fashioning a future different from the past; where an egalitarian ethos is charged with a responsibility to overcome market inequalities, and government policies are expected to offset economic injustice. Australians' ability to imagine a better future has sometimes meant economic realities are overlooked; sometimes it has resulted in exceptional welfare policies.

This chapter examines several measures of national and personal wealth and welfare. Strictly defined, an individual's wealth refers to the stock of assets under their control at a particular moment, while their income is the flow of resources that allows them to add to that stock. An individual's welfare, however, is not adequately summarised by their income or wealth, either in absolute or relative terms. In addition to a person's absolute command over resources, or their level of income relative to others, other factors, such as their health, happiness, security, freedom and access to opportunity, also impact on their welfare. Many of these are difficult to assess, and long-run information is surprisingly inconsistent, even on such narrow measures as income and wealth. This chapter focuses on economic aspects of wealth, income and welfare while also recognising some of the social dimensions impacting on an individual's wellbeing.

Other chapters detail many of the underlying factors that affect an individual's income and wealth. These include economic development, the competitiveness of the economy and level of productivity (Madsen, this volume), and the labour market and general levels of education (Hatton and Withers, this volume). Individual and aggregate levels of wealth and welfare are the outcome of these deeper economic forces, although the direction of causation

is not completely one-way. While in the aggregate Australians have enjoyed a high standard of living for many decades, the reasons behind their relative wealth are less clear.

Many of the chapters in this book discuss the comparative natural advantages enjoyed by Australia and the policies that have shaped their exploitation. This chapter examines some of the outcomes.

Previous writers

Given the close link between economic growth and living standards, it is not surprising that prior work on wealth and welfare needs to be viewed within the economic context in which it was written. Ever since the first Governor of New South Wales sent reports to the British Home Office about the progress of the penal colony, Australians have been keen to chronicle their relative wealth and progress. Prior to 1850, and certainly prior to 1830, however, Australia's reputation was of a penal hell, rather than a land of opportunity. As the need for administrators to report became less pressing, early statisticians began to record and advance Australia's economic reputation (Coghlan 1891, 1897, 1918). Colonial 'Blue Books' (later statistical registers) reported in increasing detail the vital, trade, agricultural, financial and social statistics of each colony. Reliable censuses were also introduced in the mid 19th century, with uniformity of approach being achieved shortly before Federation and the establishment of the Commonwealth Bureau of Census and Statistics (ABS 1988).

While there was much to record, the tenor of much of this work is caught in the concluding remarks of the then New South Wales statistician Timothy Coghlan's 1890 edition of *A Statistical Account of the Seven Colonies of Australasia*:

Enough has been said, however, to show how these great Colonies, from the humblest beginnings, have grown and expanded into important provinces, peopled with a race of hardy, enterprising, and industrious colonists, with free institutions such as are enjoyed by few nations in the old world, and without those social and caste impediments which are in older countries so great a hindrance to the march of civilisation. (Coghlan 1890, p. 179)

It was in the afterglow of centenary celebrations that Australians began to proclaim their country as a 'working man's paradise' (White 1981, pp. 29–46). Late 19th-century international visitors also remarked on the apparent absence of class differences, but these were frequently as much observations

on attitude and behaviour as they were on actual wages and asset ownership. Despite the early statistical records, it was not until the work of Noel Butlin in the 1960s that economically consistent and useful data on measures of GDP, capital and the contribution of different sectors of the economy were produced (Butlin 1962, 1964, 1994). The earlier work of scholars such as Coghlan (1918), Shann (1930), Hancock (1930), Fitzpatrick (1939) and Shaw (1944), among others, who wrote on Australia's wealth and progress, tended to focus on particular themes such as labour, political economy or imperialism, while commenting on living standards more anecdotally than systematically. After Butlin, the work of Sinclair (1976), Jackson (1977, 1991), Schedvin (1979), Butlin, Barnard and Pincus (1982), Dyster and Meredith (1990), Vamplew (1987), Maddock and McLean (1987), McLean and Pincus (1982) and Haig and Anderssen (2007) was far more securely anchored to reliable and consistent data. More recently still, as internationally comparable long-run data sets have been developed, the work of McLean (2004, 2005, 2013), Maddison (1995, 2001, 2010a), Prados de la Escosura (2000), Allen (1994) and Boyer (2007) has placed Australian's relative standard of living in a much clearer international perspective.

Nonetheless, in any examination of living standards, wealth and welfare, there are questions of definition and measurement to address. Long-run comparisons become difficult when some studies use individuals, others, adults, and still others, households, as the unit of interest. Different studies may use different measures of income (e.g. wage income or all forms of income), personal wealth (including or excluding debt), aggregate personal material output (GDP per capita), or consumption rather than income. The result of these many permutations is that intertemporal comparisons are difficult and our conclusions regarding individual wealth and welfare must be cautious.

The broad contours of Australian economic and population growth, especially after 1850, are discussed in Hatton and Withers (this volume). While the data before 1850 are unreliable, even then a small proportion of the white, free working-age males, supported by British funds and exploiting cheap land, natural resources and the governance gaps afforded a frontier economy, probably had a higher standard of living than many in Europe. The data after 1850 become increasingly reliable and the factors contributing to Australia's economic development are discussed in Madsen (this volume). In each subsequent period, changing growth rates, economic conditions and policy responses impact on the wealth and welfare of individuals, families and communities.

Linking growth, wealth and welfare

The link between economic growth and changes to individual wealth and welfare is not simple, as the distribution of the benefits of growth, and the forms that it can take, vary across time and place. GDP per capita, for example, has long been viewed as only approximating actual welfare growth, with its true strength being its standardised and widespread use. Nordhaus and Tobin (1972), for example, suggested a more inclusive measure of economic welfare linked to GDP but that included non-market activities, reclassified some expenditures as defensive (sanitation or police) and others, such as environmental damage, as disamenities. On such a measure, for example, over-exploitation of the Murray–Darling region for agriculture would reflect a lower welfare gain than GDP per capita measures that only include the value of agricultural outputs. More recently, the Global Progress Indicator has explicitly included environmental damage and other negative externalities to estimate national welfare levels (Kubiszewski et al. 2013). Amartya Sen suggests an individual's welfare is better estimated by their capabilities than their level of income or wealth, meaning a welfare measure should include elements such as a person's access to work or education, their personal security or health, their hours of leisure or security of home ownership (Sen 1993). In Australia's case, this measure would likely reveal a jump in welfare for all immigrants from poorer countries whose opportunities increased as a result of their arrival.

In practice, lack of consistent data means that welfare measures often reduce to including as many of the available measures as possible. Thus, factors such as infant mortality rates, life expectancy or a person's height have all been used to provide partial insights into long-run living standards. Authors who have discussed these broader dimensions of welfare for Australia include McLean and Pincus (1982), McLean (1987), Carter and Maddock (1987), Jackson (1991), Thomas (1991), Snooks (1994) and Boyer (2007). A broader approach to measuring economic wellbeing aligns with international efforts to move beyond simple comparisons of GDP per capita. One approach, which gives equal weight to life expectancy, education and GDP per capita, is the HDI. Developed by the United Nations, this index has been used to compare nations over extended time periods (United Nations 1990; Crafts 1997, 2002; Boyer 2007). Other researchers have compared average heights over time and between regions to provide insights into the net nutritional outcomes produced by an economy, and hence create a measure of development and distribution (Whitwell, de Souza & Nicholas 1997; Whitwell &

Nicholas 2001). As with comparisons of GDP per capita, each measure has its limitations (Kelly 1991).

Wealth and wellbeing

Prior to European settlement, the lack of material assets held by Aboriginal people meant that their wealth and welfare was long overlooked. With a relationship to land that was unrecognised and technologies that were disregarded, the material welfare of Aboriginal people was categorised as subsistence. It is ironic that we have only recently begun to appreciate the limitations of measuring progress solely by GDP and identified variables such as environmental sustainability and happiness as important dimensions to human wellbeing (Butlin 1993; see also Hunter, this volume).

Since the late 19th century, life expectancy has increasingly been seen as a measure that encapsulates, in a single number, the net impact of a society's standard of living, nutritional opportunities, and exposure to disease and disaster. Such a variable circumvents the limitations of market-based approaches while still providing a measure that is identifiable across time and societies. In this context, Aboriginal life expectancy at birth, prior to European invasion, has been estimated at around 40 years (Hodgson & Wahlqvist 1993). If accurate, this suggests the lifespan of native hunter-gatherers in the first 50 years of the 19th century either exceeded or was on par with that of their European counterparts (Floud et al. 2012).

The subsequent 200 years of Aboriginal history was one of displacement, marginalisation and relative deprivation. Despite contributions of labour in the pastoral economy, for example, the relative economic gains of Indigenous people have generally been second to those of whites. Descendants of the original inhabitants are still recovering from the clash of cultures (Attwood 2005). Two hundred years after the first European settlement, the life expectancy of Indigenous Australians is 15 years less than that of their non-Indigenous fellow-citizens; the Indigenous also endure sustained higher levels of unemployment, and incarceration and lower levels of education and income (Altman et al. 2009; Gray, Hunter & Lohar 2011). By contrast, the setbacks encountered by immigrants over the same period have been transitory and minor.

Since the early 20th century, comparisons of individuals' average material wellbeing measured by per capita GDP (the final goods and services produced each year per person, in a domestic economy) has become one, widely accepted, measure of prosperity. In the short term international comparisons

of GDP per capita can reflect the relative 'position' of a country's population compared with the populations of other countries. In the long run this measure can also capture the change in material wellbeing that has occurred as productivity, technology, resource exploitation and living standards have changed over time.

Figure 22.1 depicts two dimensions of Australian wealth and welfare, GDP per capita and life expectancy, over the past 200 years. The horizontal axis measures the estimated average life expectancy at birth of an individual born in a particular year while the vertical access reveals real gross GDP per person, in constant (2010) Australian dollars in each year. Each one of the almost continuous line of grey dots thus simultaneously reflects both Australian GDP per capita and Australian average life expectancy in a particular year, starting in 1830 and ending in 2010.

The figure traces the path of GDP and life expectancy for the average Australian over the past 200 years. Life expectancy for an individual born in 1830 was around 35 years, while an Australian born in 2010 can expect to live until at least 80 or slightly longer. Over the same period, measured material output per person has increased sixfold. As closely as can be compared, therefore, the 'average' Australian in 1840 could expect to live to their mid-thirties and enjoy an annual income of around \$5000 (in 2010 terms). By 2010 the average Australian could expect to live past 80 and enjoy an annual income of almost \$60 000. In both cases, these figures reflect outcomes that were, or are still, the envy of most of the remainder of the world.

As Figure 22.1 shows, the increases in life expectancy occurred most rapidly prior to 1950. Between 1850 and 1950, both life expectancy and real GDP per capita roughly doubled. Since the 1950s, the increase in per capita GDP has accelerated, increasing by more than 300 per cent, while the improvement in life expectancy only increased around 15 per cent. As Table 22.1 illustrates, the changes in life expectancy reflect the major improvements that occurred in infant mortality before 1950 and more recently the advances to health care enabling people to live longer. Both these major changes are themselves a function of several factors, including improved sanitation, nutrition, and other health and lifestyle factors as well as changes in productivity, technology and individual expenditure (Haig & Anderssen 2007). The lowering of infant mortality and increase in longevity have both produced a large decrease in the inequality of lifetimes in the population, which is itself a fundamental inequality (Peltzman 2009).

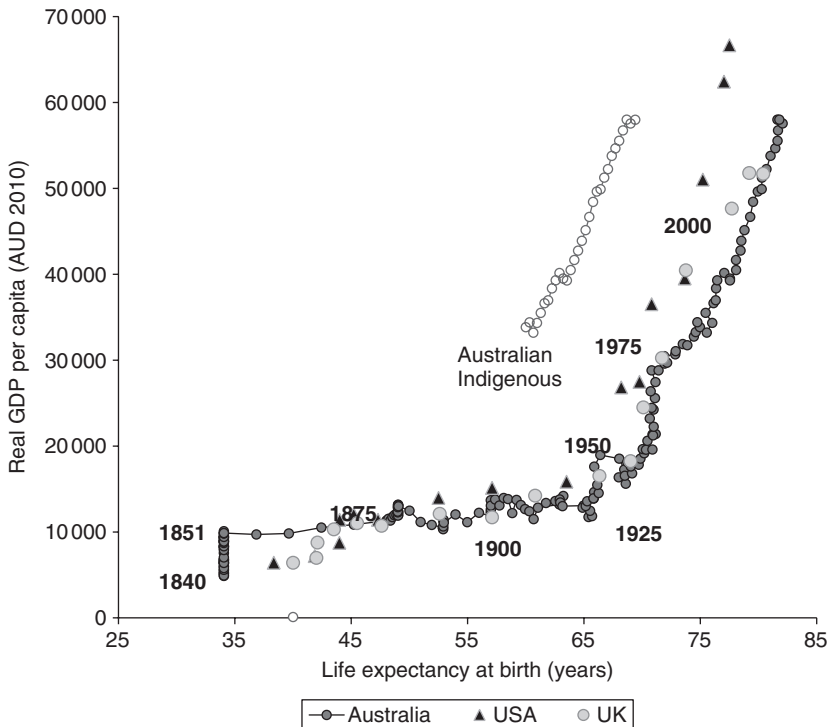


Figure 22.1 Australia, United Kingdom and United States: GDP per capita and life expectancy, 1788–2010

































































Notes: Data on Indigenous life expectancy are not available other than the pre-European settlement estimate of Hodgson and Wahlqvist (1993) and the Gray (1997) 1981 estimates. Sources: *GDP per capita*. Australian and Indigenous GDP per capita calculated from Hutchinson (2010) and ABS (various dates). UK and US figures calculated from Prados del Escosura (2000). Post-2000 figures are based on spliced midpoint estimates from Prados del Escosura (2000) and Maddison (2010a).



Life expectancy. Australia: ABS (2012b); The Human Mortality Database, <http://www.mortality.org>. Indigenous: Gray (1997); Hodgson & Wahlqvist (1993); ABS 2012b; Young (1976). UK and USA: Riley (2005); World Bank (2012); Gapminder (2012).

Estimates of the life expectancy of the Australian Indigenous population are also included in Figure 22.1 (although, besides Hodgson and Wahlqvist's estimate, there are no data points available before 1970).

The path of growth of GDP per capita shown in Figure 22.1 also describes the standard description of long-run Australian growth, with the

Table 22.1 Mortality of Australian infants (<1 year) and living adults aged over 65, 1871–2003

1871		1901		1947		1971		2003	
IM	Age >65	IM	Age >65	IM	Age >65	IM	Age >65	IM	Age >65
107	17	108	40	28	80	17	83	5	126
                                                               									

Key: Each  represents an infant mortality (IM) rate of 10 deaths per 1000. Each  represents 10 people per 1000 aged over 65 (>65). Exact rates are given in third row.
 Sources: Author's calculations from A2 Oceania. Population of selected countries by sex and age groups (in thousands). Deaths of infants under one year old per 1000 live births (Mitchell 2007).

pre-1890 and post-1945 periods exhibiting essentially positive, and for periods sometimes very sharp, growth, while the 50 years between 1890 and 1945 were comparatively stagnant when measured by material outcomes (Schedvin 1970; McLean & Pincus 1983; Gregory & Butlin 1988; McLean 2004).

Selected estimates of life expectancy and GDP per capita are also shown in Figure 22.1 for the United Kingdom and United States at the start of each decade, beginning in 1850. Together with the Australian observations, these points reflect the celebrated outcome, that for a

period in the late 19th century Australia's GDP per capita exceeded that of either the United States or the United Kingdom (or any other country for which we have data) and that our life expectancy was similarly high (Maddison 2010a; Prados de la Escosura 2000). The ascendancy of the United States in the 20th century, over both the United Kingdom and Australia, is also reflected in per capita GDP, but less so in longevity. While Australia appears to have been a world leader in material output per capita in the mid to late 19th century, this lead was lost over the 20th century. Reasons for this are discussed elsewhere in this book (Madsen, this volume; McLean 2007, 2013).

Measures of per capita GDP and life expectancy by themselves, however, do not capture all the elements that contribute to welfare. While the GDP data suggest that the period from 1890 to 1939 was one of economic stagnation, the gains in life expectancy suggest other aspects of living standards improved. Such factors include unemployment, leisure hours, increasing consumption, non-market household services, education, and housing quality, several of which may have improved over the same period (McLean & Pincus 1983; McLean 1987; Dowrick, Dunlop & Quiggin 2001).

Outside of GDP and life expectancy measures, fewer consistent data are available. Data on consumption, for example, are mostly available only for the 20th century, but do provide a different insight into average living standards. They suggest that real consumption per head between 1900 and 2000 increased by a factor of 3.8. They also suggest that the first third of the 20th century was more stagnant than the GDP data reveal, with no increase in per capita consumption between 1900 and the mid-1930s (Haig 2001; Haig & Anderssen 2007, p. 421).

Related to consumption, employment is well established as a critical factor determining individual wellbeing. Unfortunately, long-run internationally comparable figures on unemployment are difficult to obtain, and conclusions on Australia's relative rates of unemployment must remain tentative (Galenson & Zellner 1957; Withers 1987; Hatton and Withers, this volume). The available data suggest that, at least after 1900, the impact of business cycles on Australian unemployment levels was on a par in duration and magnitude with what was occurring in other countries. Data on unemployment before 1900 are more sketchy, although the impact of earlier depressions, especially in the 1890s, was severe (Seltzer, this volume; Coghlan 1918). Easily overlooked with the missing data are the social, political and policy consequences that unemployment and falling consumption

triggered. In a nation of migrants, at least one response involved ensuring that the least well-off did not suffer the same fate as occurred in the 'old countries'. This was achieved for two decades after World War 2 but was challenged in the mid-1970s. Subsequent shocks have seen unemployment vary in a manner that corresponds with other developed countries, but rarely reaching the same depths as occurs overseas (Keating, this volume; OECD 2013; Withers 1987).

An increase in the number of leisure hours (or conversely a decrease in the number of hours of work) can reflect changing living standards. Around the world, average weekly working hours have decreased greatly since the 19th century (Huberman 2004). Australia, like many of the New World countries, exhibited lower weekly working hours in the 19th and early 20th centuries than did countries in the Old World. In addition to having some of the highest real wages in the world in the 20th century, Australians enjoyed some of the shortest working hours until the 1930s, as Figure 22.2 reveals (see also Allen 1994). This reflects Australia's early reputation for high living standards (and perhaps explains our obsession with sporting activities) but the continuation of lower working hours may also partially explain Australia's later decline in the international rankings (McLean 2007; Shanahan & Wilson 2013). With the 1930s depression, the average hours worked per week in some countries fell below Australia and by the 1960s the range of weekly working hours had decreased around the world. By the 1990s the standard working week in Australia was above the world average. A similar pattern is observed with annual hours at work (which takes into account variations in holidays), with Australia moving from below average to above average between 1870 and 2000 (Huberman & Minns 2007).

Australians' preference for home ownership is yet another lens through which to view individual wealth. Home ownership can reflect relative wealth and also serve as a form of social insurance (Headey, Marks & Wooden 2005; Yates & Bradbury 2010). Although home ownership is positively associated with wealth ownership, good health and higher educational outcomes, only some communities directly link this to high levels of owner-occupation. While Butlin (1964) identified the important contribution of house building to the Australian economy for the latter half of the 19th century, the extent of owner-occupation in Australia is less clear; there are suggestions that it was comparatively high in the 1880s before declining by 1900 (Butlin 1964). As Table 22.2 shows, across the 20th century the proportion of Australians

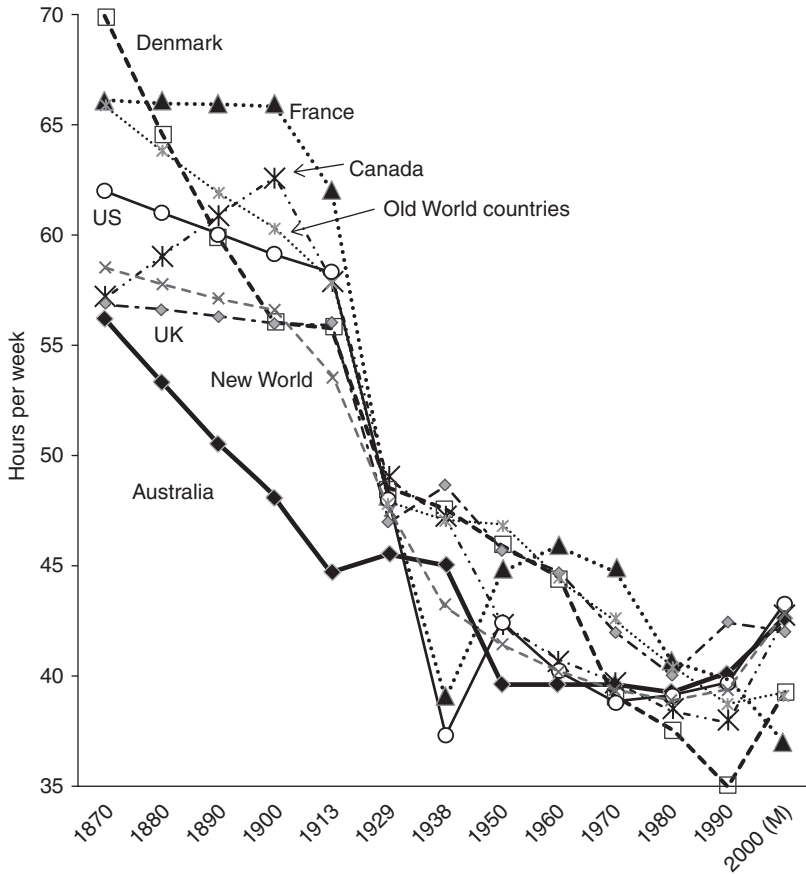


Figure 22.2 Hours of work per week, 1870–2000

Note: Figure for the year 2000 refers to males (M). Old World figures are population weighted averages of Belgium, Denmark, France, Germany, Ireland, Italy, Netherlands, Spain, Sweden, Switzerland and UK. New World includes Australia, US and Canada. Source: Adapted from Huberman and Minns (2007, Table 1).

owning their own home has been only slightly ahead of Canada and the United States, with some collective increase (above 50 per cent) really only evident after World War 2.

On this scale, Australian's reputation for home ownership, although strong in the late 19th and early 20th centuries, seems to be most true in comparison to the United Kingdom, with our levels of ownership only

Table 22.2 Percentage of owner-occupied housing in four countries, 1891–2006

	Canada	United States	England and Wales	Australia
1881				>55
1891		48		
1901		47		
1911		46		49
1914			10–20	
1921	58	46		52
1931	61	48		53*
1938			35	
1941	57	44		
1947			27	53
1951	66	55		63*
1961	66	62	43	
1966			48	71
1971	60	63	50	69
1981	62	66	58	70
1991	63	64	67+	69
2001	66	68		70
2005	66	69	70	70*

Notes: * refers to 1933, 1954 and 2006 (Australia). + refers to 1994 (England and Wales). The 1914 'range' for England and Wales is understated; see the discussion in Swenarton and Taylor (1985), pp. 374–6. All figures include urban and rural areas.

Sources: Canada, USA and UK: Harris & Hamnett (1987), Table 1; Lawson & Milligan (2007). Australia: Butlin (1964), pp. 259–62; Vamplew (1987), pp. 142–59.

marginally higher than other New World countries, such as Canada and the United States.

Access to education is well known as being important for both individual and national living standards, with impacts on growth and inequality (Borland & Kennedy 1998; Goldin & Katz 2008). One international measure of living standards that includes a measure of education is the HDI.

The HDI, produced by the United Nations, consists of three components, education (E), income (I) and longevity (L), with equal weights given to each to produce a single index number (United Nations 1990, 2001, 2005). Table 22.3

Table 22.3 United Nations Human Development Index, 1870–1999, selected years and countries

1870		1913		1950		1975		1999	
Australia	0.516	New Zealand	0.711	New Zealand	0.803	Switzerland	0.872	Norway	0.939
Switzerland	0.515	Australia	0.696	USA	0.802	Canada	0.867	Canada	0.936
Denmark	0.512	Denmark	0.66	Netherlands	0.784	Denmark	0.866	Sweden	0.936
USA	0.506	Netherlands	0.649	Switzerland	0.782	Sweden	0.862	Australia	0.936
UK	0.5	Canada	0.646	Denmark	0.781	USA	0.861	Belgium	0.935
Canada	0.488	UK	0.644	Australia	0.78	Netherlands	0.86	USA	0.934
Netherlands	0.486	Switzerland	0.643	Sweden	0.78	Norway	0.856	Japan	0.928
Sweden	0.483	USA	0.643	Norway	0.776	Japan	0.851	Finland	0.925
Belgium	0.469	Sweden	0.641	Canada	0.772	France	0.846	Switzerland	0.924
France	0.463	Norway	0.631	UK	0.766	Belgium	0.845	France	0.924
Germany	0.463	Germany	0.614	Belgium	0.751	Australia	0.842	UK	0.923
Norway	0.454	France	0.607	Germany	0.744	UK	0.839	Germany	0.921
Regions*									
Australasia	0.516		0.708		0.784				0.932
North America	0.504		0.643		0.774				0.934
Western Europe	0.421		0.58		0.707				0.918
Africa					0.271				0.527
China					0.225				0.718
India			0.143		0.247				0.571

Notes: * Averages weighted by population size relate to countries included. Unfortunately, expressed as a single number to aid comparisons, the HDI does not identify the relative contribution of each component. Nor does it indicate the distribution of these elements across the population.

Source: Adapted from Crafts (2002, Tables 1, 2, 3 and 4). The HDI website is at <http://hdr.undp.org/en/statistics/hdi>.

reproduces the results for a range of countries for selected years from 1870 to 1999. The table reflects both Australia's high rank in 1870, its lower rankings thereafter and a return to high levels by 1999. The table also reflects that, including New Zealand, our part of the world has exhibited particularly high levels of development for almost one and half centuries.

Distribution of resources

The distribution of personal resources is an element impacting on personal wealth and wellbeing. Australia had a correctly deserved reputation for high wages in the second half of the 19th century; labour was relatively scarce, and productivity was high. Our knowledge of the degree of inequality in the 18th and early 19th centuries, however, is limited to small windows of insight. Estimates suggest, for example, that in 1790 the top one per cent received around a quarter of all income, a distribution not unlike that of the mid 20th century (Thomas 1991, pp. 149–73; Leigh 2013, p. 158). The key factor of production, land, appears to have been even more unequally distributed (Leigh 2013, p. 20).

Australian colonial authorities revealed an early interest in the distribution of wealth, publishing the occasional discussion about the distribution of probate records or land ownership in their statistical registers.

These [probate] figures show a distribution of wealth not to be paralleled in any other part of the world; and in a country where so much is said about the poor growing poorer and the rich richer, it is pleasing to find one out of every four adult males and females the possessor of property. (Coghlan 1897, p. 322)

Less convinced, however, was the poet Henry Lawson:

They lie, the men who tell us for reasons of their own
That want is here a stranger, and that misery's unknown;

Lawson (1888)

One insight is gained by examining the years in which men who qualified as members of the all-time richest Australians died during the period 1790–2010 (Rubenstein 2004). Identifying the 233 richest ever people in Australia (to qualify you must have left an estate worth more than 0.17 per cent of GDP), one finds the peak decades (with over 50 cases in each period) were in the 1820s, 1880s and 1890s. There were no candidates between 1940 and 1980 (Leigh 2013, p. 21). Broader measures of the distribution of personal wealth are described in more detail later.

As with wealth distribution data, little is known about the distribution of income. Again, the data are incomplete, with wages and salaries being more easily identified than income from shares, interest and rents. Information on income distribution is principally based on taxation data, although income taxes were only introduced in each colony after 1880. It was not levied at a national level until 1915. As with earlier wealth studies, research into income distribution was relatively spasmodic until the 1970s and 1980s when interest increased (Brown 1957; Hancock 1971; Hancock & Moore 1972; Jones 1975; Berry 1977; Butlin 1983b; McLean & Richardson 1986). More recently, Borland and Wilkins (1996), Harding (1997), Harding and Greenwell (2002), Saunders (1993) and the HILDA surveys have looked at the distribution of income using techniques ranging from surveys to computer modelling. As with all measures of wellbeing, few of these studies are directly comparable, as they use different definitions – for example, pre- or post-tax income, income unit (individuals, adult males, taxpayers, households) and collection methods (survey; tax data). The ABS has been publishing information on income distribution irregularly since the late 1970s, and biannually since 2001. Leigh (2005) and Atkinson and Leigh (2007) have recently reported on the distribution of top income earners using tax records that cover most of the 20th century. This topic is discussed below.

Our knowledge of other important issues, such as long-run poverty, or social mobility, is much less anchored.

A person's income is an important contributor to their wellbeing and can be derived from their labour or ownership of land, shares, property or other assets. Figure 22.3 provides some insight into the distribution of taxable incomes over the 20th century, reflecting the share of income held by the top taxpayers in Australia between 1921 and 2007. While the findings exclude a large proportion of income holders, they suggest that in the first decades of the 20th century, the top 10 per cent of income earners received over a third of all taxable income. While this fell in the 1930s to around a quarter, by the early 1970s the proportion rose again so that by the end of the century the top 10 per cent was again receiving 30 per cent of taxable income. Similar patterns are seen among the top five and one per cent of tax-paying income earners. It would also appear that most of the decline in inequality occurred after the early 1930s, a finding consistent with previous work (McLean & Richardson 1986). Certainly by the 1980s the 'great compression' of the mid 20th century appears to have disappeared (Leigh 2013, pp. 30–45).

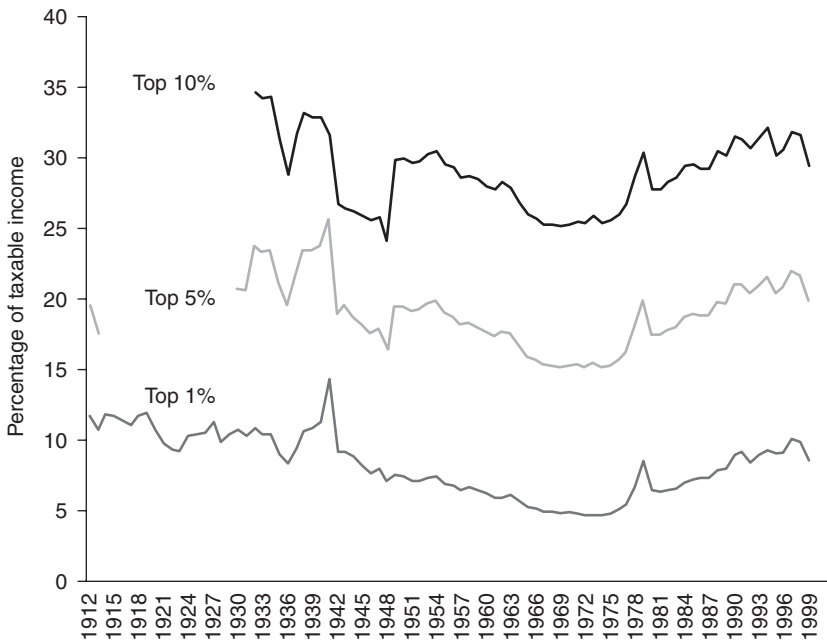


Figure 22.3 Share of taxable income held by top income taxpayers in Australia, 1921–2007

Source: Atkinson & Leigh (2007), ch. 7. Series updated by the same authors.

The rise of international trade and migration in the late 19th century, their retreat between the world wars, and the rise of globalisation in the post-World War 2 period are frequently cited as causing changes in national and international inequality (Lindert & Williamson 2003). While the evidence is not unequivocal, it would appear that Australia, like many other New World countries, reached a peak of inequality towards the end of the 19th century, and thereafter followed the OECD pattern of declining inequality until the 1970s when it began to increase again (Williamson 1997; O'Rourke & Williamson 1999). The change in equality across the 20th century was observed in a number of countries, as Figure 22.4 shows. The changes that occurred to taxable income inequality in Australia were mirrored elsewhere, while the overall level of inequality was roughly mid-range relative to other countries. Despite Australians' self-perceptions, the pattern, in relative and absolute terms, is not outstandingly egalitarian. The taxable income data suggest that inequality in Australia early in the 21st century is less than it was a century ago, but greater than existed during the mid 20th century.

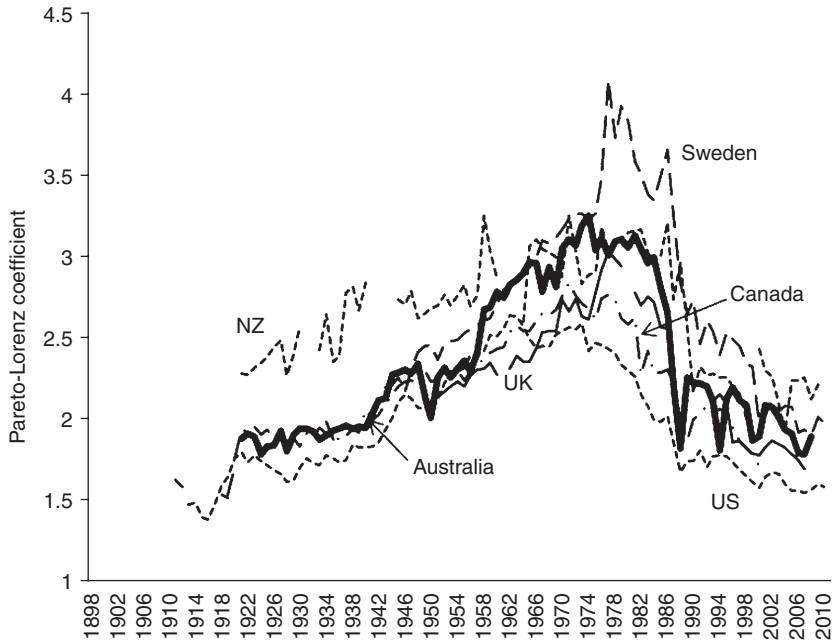


Figure 22.4 Pareto-Lorenz coefficients for selected countries, 1899–2010

Note: The Pareto-Lorenz coefficient shown here reflects the proportion of income held by the top 10 per cent of all income taxpayers. The larger the coefficient, the smaller the share held. An increase in the coefficient reflects a decrease in equality.

Sources: Atkinson & Piketty (2010); The World Top Incomes Database, <http://g-mond.parisschoolofeconomics.eu/topincomes/>.

Unfortunately, information about the distribution of wealth is more difficult to gather than for the distribution of income. World War I saw the collection of the first (and only) wealth census in Australia (Knibbs 1918; Soltow 1972). General interest in wealth distribution was sporadic until a number of studies started appearing in the 1970s that estimated the distribution of wealth indirectly using estate data (Gunton 1975; Raskall 1977, 1978; Poddar & Kakwani 1976). Many of these focused on individual colonies in the 19th and early 20th centuries (Rubenstein 1979, 1980, 1984; Shanahan 1995, 2001). More recently, researchers have returned to examining wealth distribution, albeit still using indirect methods of estimation, and for households rather than individuals, while the Reserve Bank, the HILDA surveys and NATSEM have also turned their attention to this issue (Piggott 1984, 1987; Kelly 2002; Headey, Marks & Wooden 2005; Bloxham & Betts 2009). The net

Table 22.4 Estimated distributions of wealth in Australia, 1915 to 2009–10

Categories	1915 Adults	1953 Individual	1966–67 HH	1998 HH	2002 HH	2005–06 HH	2006 HH	2009–10 HH
Bottom quintile	0.03		0.91	0.4	0	1.0		0.09
Second quintile	0.43		7.81	4.0	4.0	5.7		5.4
Third quintile	2.01		15.06	11.1	16.0	12.1		11.9
Fourth quintile	7.80		22.72	21.6	22.0	20.0		20.0
Top quintile	89.71	55.3*	53.51	62.8	63	61.1		61.8
Top 5%	66.22	41.89	24.58	28.8	31			
Top 1%	39.46	18.51	9.26	10.4				
Gini coefficient	0.861	0.681	0.52		0.61		0.61	

Note: HH stands for household. The Gini coefficient is a measure of inequality where a value of 0 represents perfect equality and a value of 1 perfect inequality.

Sources: Columns 1 and 3: Poddar & Kakwani (1976), Table 14. Column 2: Gunton (1975), Table 7.5. Column 4: Kelly (2002), Table 1. Column 5: Heady, Marks & Wooden (2005), Table 2. Columns 6 and 8: ABS (2009–10), Table 1. Column 7: Bloxham & Betts (2009), p 226.

* = Top 10% for 1953 only.

result is that, apart from the data from 1915, we still have only a partial and incomplete insight into personal wealth and its distribution in Australia.

One approach that has provided long-run estimates of wealth distribution is taxes on probated estates or the amounts transferred to others at death (succession duties); these have existed in Australia for more than a century. They were introduced in New South Wales in the mid 19th century and existed in different forms in all colonies by 1900. The Commonwealth introduced estate duties in 1914, but by 1984 all levels of government had abandoned taxation in this area. It is possible to use some of the data collected under these various taxes, together with the wealth census of 1915, to create insights into the distribution of personal wealth (Davies & Shorrocks 2000). Table 22.4 shows, in broad terms, the distribution of personal wealth in Australia over the course of the 20th century. Note that the results for each period are collected differently and refer to different units of measurement. Nevertheless, the amounts attributed to the top quintiles in each period suggest that wealth inequality was high prior to World War I and declined through to the mid 20th century before rising again toward the end of the century. Such a pattern is consistent with changes in wealth inequality over the same period in other countries (Lindert 2000).

The Gini coefficient is a measure of inequality where a value of 0 represents perfect equality and a value of 1 perfect inequality.

It is also possible to examine regional differences in wealth and income distribution, although differences in age profiles are a complicating factor. In the 1880s, for example, Coghlan noted that probated wealth was distributed most unequally in Queensland and New South Wales, and most equally in South Australia and Victoria – although the estates of highest value were left in New South Wales (Coghlan 1897, p. 322). By 2010 the Australian Capital Territory and Western Australia were the regions with the highest average net worth (ABS 2009–10, Table 30). Australia has always been particularly subject to the impact of commodity price shocks, whether it was gold in the 19th century, wheat and wool prices in the 19th and 20th centuries or, more recently, coal and iron ore. These commodity shocks have had a significant impact on the overall distribution of income, with booms in non-renewable resources increasing inequality (Bhattacharyya & Williamson 2013).

The extent to which governments intervene to help the disadvantaged, offset inequalities or provide opportunities is driven as much by a society's imagination and self-identity as it is by economic or political reality. For Australia, the provision of welfare has shifted from approaches that followed strict 18th-century penal provisions through to 19th-century poor laws, and in the self-assured, but more desperate, periods after the 1890s, more exceptional social experimentation. Australians' expectation that governments should respond is not surprising when one recalls the extent of government intervention in the penal and colonial eras (Butlin, Barnard & Pincus 1982, pp. 10–48). Such responses were also consistent with a country that imagined a better future for itself and its people. By 1900, administrations had, at different times, involved themselves in distributing food and shelter; allocating land; establishing and regulating free secular schools; building public orphanages, hospitals and poor houses; and creating destitute boards and children protection agencies.

Policy is also frequently reactive, with governments at colonial, state and later national levels reacting to the crises of the 1890s and 1930s and the human consequences of several wars. At the macroeconomic level, this saw the development of policies such as New Protection, and related to this, the introduction of the minimum wage in the 1907 Harvester Judgment (Hancock 2013; Shanahan 1999). Australia (and also New Zealand) was often at the forefront of many social programs, such as the introduction of limited outdoor work 'relief', and subsidised transportation to find work (1890s);

age pensions (1900 in New South Wales, 1909–10 nationally and means-tested from the 1930s onwards); workers compensation (1900 in South Australia, nationally from 1908); soldier settlements (1917); and between 1941 and 1949, child endowment, widows pensions, funeral benefits, unemployment benefits, sickness benefits, pharmaceutical and hospital benefits, and state government housing (Reeves 1923; Dickey 1987; Macintyre 1985; Mendelsohn 1979; Greig, Lewins & White 2003; Murphy 2011).

The latter part of the 20th century saw the introduction of other notable welfare policies, including the introduction of universal health care (Medibank, 1975; Medicare, 1984); income-contingent tertiary loans (1989), industry-based superannuation funds (1984–87); and most recently, a national disability scheme (2013). Nevertheless, serious social problems, such as poverty, remain (Henderson 1975; ACOSS 2012; Melbourne Institute of Applied Economic and Social Research 2013). In the past two decades market-based solutions and concerns about the rise of middle-class welfare expectations have tested policymakers. They have also apparently lessened, but not extinguished, Australians' appetite for social welfare initiatives.

Two relatively constant characteristics of the Australian approach have been its tight focus on needs (means testing), and the centrality of the role of the labour market compared to the welfare sector (so, for example, labour market institutions, minimum wages and full employment targets have all been key). Nevertheless, for many years, Australia also aimed to create a system that did not stigmatise recipients (Castles 2001). As Figure 22.5 shows, government expenditures on welfare payments have grown around the western world over the 20th century, and particularly after 1940. While Australia has clearly followed this pattern, it also remains, as it was in the late 19th century, one of the lowest contributors to welfare payments of any OECD country.

While the above discussion provides important insights into separate aspects of Australian's wealth and welfare, examining each factor in isolation can also be misleading. Welfare payments that partially accrue to the middle class, for example, may be deemed acceptable if they prevent poverty traps when benefits are cut precipitously. Australia's relatively low expenditure on welfare payments may actually reflect a comparatively more efficient policy design (Keating, this volume; Whiteford 2013). Measured income inequality, although rising in recent years, may have less impact on personal circumstances than in the past and elsewhere, because of better targeted welfare policies or overall rising real wages. One of Australia's most distinguishing features over two centuries has been how policymakers have repeatedly grappled with such complex problems in a genuine effort to effect a better future.

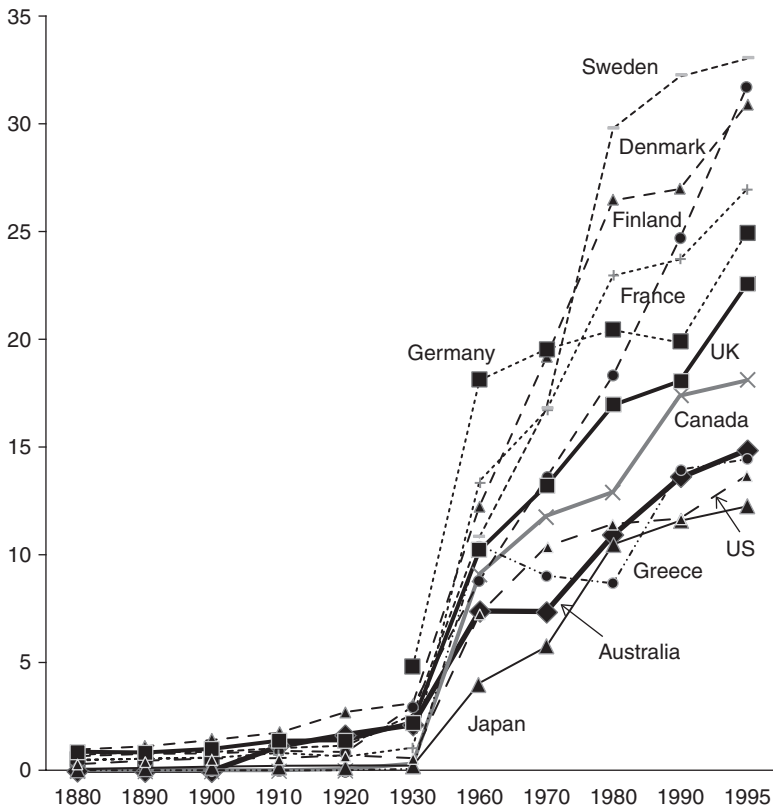


Figure 22.5 Social transfers in selected countries, 1880–2010 (% of GDP at current prices)

Note: Data for the period 1880–1930 reflect expenditure on welfare, unemployment, pensions, health and housing subsidies. Estimates for 1960–70 are based on the OECD Social Expenditure Database (old series) (<http://www.oecd.org/social/expenditure.htm>) while estimates for the period 1980–2012 are based on the OECD data extract series (OECD StatExtracts, <http://stats.oecd.org>).

Sources: Adapted from Lindert (2004, Table 1.2).

Conclusion

After a little more than two centuries of European settlement, the Australian economy has progressed from a single, small penal settlement of a few hundred residents and an indigenous population of several hundred thousand, to an urbanised population of 23 million. For most of that time, Australians, on average, enjoyed a standard of wealth and wellbeing that remained among

the highest in the world. Not everyone did equally well. The distribution of resources was, at times, less unequal in the past and has become more unequal in recent years. Certain groups, particularly the original inhabitants, continue to benefit less than others. But over the past four generations, life expectancy, education, technology, communication, transportation, material output, housing and general living standards have improved almost beyond recognition. Certainly, the emancipated convict standing in dusty Pitt Street in 1848, or the domestic cook working for a middle-class family in Toorak in 1898 or even the office clerk writing ledgers for his stock agent in Brisbane in 1948 would scarcely recognise the living standards enjoyed by many today.

Whether Australians can claim this achievement to be the result of their own actions, their inheritance, or international factors is still debated. Australians have exploited their resources and combined these with sometimes pioneering policies and political responses. But resources, policies or political responses, by themselves, do not create wealth. They require a mixture of many other elements, such as human, financial and technological capital; national and international markets; infrastructure; appropriate social, cultural and governmental institutions; social values; and luck. Historically, as the economic and social challenges changed, so did the combination of elements necessary to maintain prosperity. The challenge for Australia will be to continue to find the combination that maximises national and individual wealth and wellbeing now and into the future.

Property rights regimes and their environmental impacts

EDWYNA HARRIS

Introduction

Recent studies examining the effects of institutions on long-run growth outcomes have emphasised the role of endowments in shaping institutions that determine property rights and the corresponding production, consumption, and exchange relationships these foster (Acemoglu & Robinson 2000; Acemoglu, Johnson & Robinson 2001; Denoon 1983; Easterly & Levine 2003; Engerman & Sokoloff 2003; Glaeser et al. 2004; North 1990; Sokoloff & Engerman 2000). The role of endowments has been particularly emphasised in shaping the long-run growth outcomes of former colonies, including Australia. Over the course of 200 years of settlement Australia has been remarkably successful at exploiting its endowments, particularly in relation to environmental assets such as water and land, pursuing approaches that have positively contributed to economic growth. This chapter explores the evolution of property rights used to allocate and price land and water in Australia to better understand how these rights have influenced economic growth.

The exploitation of resources in Australia has not been without costs and environmental degradation, particularly in recent years, and has been a major concern for both federal and state governments. Nevertheless, the optimal level of degradation is unlikely to be zero in many circumstances because society values the output produced even when it causes positive levels of damage to the resource being exploited. In practice, attempting to calculate the optimal level of degradation faces significant information constraints associated with the costs and benefits of current versus future use and scientific understanding of human impacts on a given ecosystem. Obtaining sufficient scientific information can take many years and, as such, damage inflicted on an environmental asset 100 years ago may not be recognised until the science is available to suggest the extent of degradation experienced is

higher than any natural damage that would have occurred in the absence of human exploitation. The cost of this damage then needs to be weighed against the optimal level of damage society is willing to bear to utilise the resource as an input for production.

This chapter provides an historical overview of property rights institutions, examining how these have contributed to Australia's long-run economic development, and explores the degradation of natural assets that may negatively impact future economic growth. The remainder of the chapter is arranged in four main sections. The first outlines the rise of wool production in the 19th century. The second highlights the evolution of property rights to land and water in the context of gold mining and the impacts of resource exploitation on the surrounding environment. The next section explores the political changes of the 1850s that resulted in the allocation of land away from wool producers and the establishment of small landholders on much of the Australian interior. The final main section discusses the changes in property rights to land and water ushered in by the rise of small-scale agriculture, highlighting the introduction of government-sponsored irrigation. The negative effects of the adoption of irrigation are also addressed.

Wool

Australian economic development in the 19th century was underpinned by the expansion of wool production across frontier lands. Combined, the endowments of south-eastern Australia, specifically the Mediterranean climate, abundant pastoral land, and scarce labour led wool production to have a comparative advantage over all other types of production during that period (Harris 2013a). Recent work by McLean (2013) examined how the nature of Aboriginal occupation affected the endowments inherited by European settlers in 1788. Aboriginal people had significantly modified the landscape in order to meet their needs and support a hunter-gatherer society (White 1992). One of the main ways in which Aboriginal people altered Australia's endowment, inadvertently creating conflict between their land use and that of European settlers, was via the use of firestick farming (Hunter, this volume). The transformation brought about by Aboriginal land management practices proved to be critical for the successful wool production on which the Australian economy relied for much of the 19th century. As Cashin and McDermott (2002, p. 250) aptly note, 'for a land abundant, labour scarce, isolated region dependent on long distance transportation, wool was an ideal commodity'.

Wool: land and water rights

Wool production relied on exploiting vast areas of unused colonial land (Greasley, this volume). The British Colonial Office, whose agent in Australia, the colonial governor, implemented its directives, determined access to land and general land disposal policies. Initial efforts to concentrate settlement around Sydney Cove led to the declaration of the legal boundaries of settlement in 1827, known as the Nineteen Counties, and were borne out of Wakefieldian notions of systematic colonisation (Kociumbas 1988; Roberts 1924, 1935).¹ However, economic pressures, including population increases (Seltzer, this volume, Table 8.1), high land prices (Burroughs 1967) and growing demand for Australian wool in Britain (Shergold 1987), increased the net present value accruing from settlement outside the boundaries. Settlers illegally occupying land beyond the Nineteen Counties were known as squatters and the colonial governor did not prevent the expansion of this practice. In fact, in 1834 Governor Bourke advised the Secretary of State at the British Colonial Office: 'It is not the policy, nor would it be within the power of government to prevent an occupation which produces so profitable a return' (Bourke quoted in Shaw 2003, p. 4).

The inability and unwillingness of the resource-constrained New South Wales governor to prevent or remove squatter occupation resulted in the British parliament legalising the practice under the 'Squatting Act' (7 Wm. IV. No. 4, 1836). This Act introduced annual licences that permitted squatters to occupy as much land as they wanted for £10 per annum. Licences were enforced by Commissioners of Crown Lands and provided squatters with occupancy rights enforceable against all parties except the Crown.² Over time, greater competition for land to graze sheep led squatters to agitate for more secure property rights to their land claims (Alston, Harris & Mueller 2011). Squatters' economic importance both in Australia and Britain led them to have a high level of political connectedness and they exploited this power to add strength to their lobbying activities in London (Burroughs 1967). In addition, the absence of competing uses for land meant squatters' demands

1 Wakefield's theory of colonisation hinged on setting a 'sufficient' land price to increase government revenues which could then be used to assist migrants from Britain. Together, these goals were aimed at relieving the difficult economic conditions in Britain and the general labour shortages of the colonies. For more details on this theory refer to Roberts (1935, pp. 79–101).

2 There was an active market for squatters' runs. For example, Governor Gipps noted in correspondence with the Secretary of the British Colonial Office (Glenelg) that 'the right of occupation of a station has also become an article of common sale, the sums of which vary from between £100 to £500' (Watson 1925, p. 546).

for more secure tenure did not have to be weighed up against valuable alternatives (Alston, Harris & Mueller 2011). By 1847, squatters obtained leases for the land they occupied (9 & 10 Vic. c. 104, 1846).

At the frontier (unsettled districts) leases were granted for 14 years. Land rentals were set at a minimum of £10 for the first 4000 sheep and £2 10s for every 1000 sheep thereafter. For the duration of the lease, land could only be sold to the occupier (Alston, Harris & Mueller 2011). Squatters were also granted rights of pre-emption that permitted them to buy 640 acres for every 16 000 acres of leased land at £1 per acre. Squatters land rights remained relatively stable for the next decade; however, by the late 1850s an exogenous shock – the gold rush – resulted in changes to the political system that led directly to land reform in 1861 (detailed in the ‘Gold’ section below).

One advantage of the 1836 legislation was that it allowed squatters to claim multiple, geographically dispersed parcels that provided some insulation against the vagaries of the Australian climate. In the south-eastern parts of the continent where the initial expansion of sheep production took place, the climate is generally classed as Mediterranean, characterised by hot, dry summers and mild, wet winters. Eighty per cent of Australia receives less than 600 millimetres of rainfall, with 50 per cent having less than 300 millimetres (Bureau of Meteorology 2013). Australian rivers exhibit a high coefficient of variation of annual flow, estimated at 1.12 compared with a world average of 0.33 (Finlayson & McMahon 1998). As a result, until the construction of vast storages and irrigation networks in the drier interiors of New South Wales and Victoria, the use of surface water as a substitute for rainfall was constrained. Moreover, squatters had little incentive to invest in securing water supplies because their occupation rights could be removed at any time without compensation while the risks associated with searching for and locating potable groundwater were high (Lloyd 1988). These climate characteristics gave wool production an important advantage over other more permanent forms of agriculture because sheep mobility provided some insulation from the variable climate (Harris 2013b).

Transhumance is the movement of stock between pastures that permits the maintenance of a larger population of livestock than would otherwise be possible (Halstead 1987).³ The ability to maintain a large livestock population under the practice of transhumance also helps reduce the risk associated with a variable climate. In addition, squatters used their multiple claims,

3 The practice of transhumance was adopted by squatters almost immediately on their occupation of land outside the Nineteen Counties (circa 1834).

including summer and winter properties, as substitutes, further reducing the risks of climate variability (Harris 2013b). Access to water was governed by the English common law of riparian rights, under which an entitlement to use water was acquired by occupying land that came in to contact with the water source. This gave squatters the right to access water on all parcels of land for which they held a licence. Unlike prior appropriation, riparian rights were not governed by a 'use it or lose it' rule.⁴ This doctrine complemented the practice of transhumance that was also supported by the customs that arose to establish rules for travelling stock (Alston, Harris & Muller 2011; Cameron & Spooner 2010; Harris 2013a, 2013b; Johnson 1994).

Wool and land degradation

Several negative environmental effects accompanied the spread of wool grazing during this early period of economic expansion: soil degradation in the form of compaction, biodiversity losses and the introduction of non-native species. However, state or national recognition of these effects did not occur until well into the 20th century (Wasson & Sidorchuk 2000).⁵ Soil compaction resulted from the introduction of hooved animals with European settlement.⁶ The introduction of non-native hooved livestock also led to the removal of native vegetation through defoliation that decreased water infiltration while increasing erosion and reducing plant growth (Greenwood & McKenzie 2001). In addition, transhumance led to overstocking and the extension of grazing to marginal lands, which made these areas more vulnerable to soil compaction. Undoubtedly, scientific understanding of the causes and consequences of soil compaction were, at the time, limited so that private or public action to minimise this damage may have been constrained. Moreover, these past practices may reflect the optimal use of resources given the economic and technical circumstances at the time (Kirby & Blythe 1987).

In the case of wool's comparative advantage on interior lands in the 19th century, therefore, even in light of the degradation caused, it is possible that

- 4 Prior appropriation allocated water rights between users based on the principle that first in time is first in right.
- 5 Surprisingly, mid 19th-century legislative intervention for the protection of species was primarily established to preserve non-native species (Garden 2005). Moreover, while very few native animals were hunted for their skins, those that were, such as kangaroos and koalas, likely experienced a significant deterioration in their numbers (Garden 2005).
- 6 Greenwood and McKenzie (2001) note that the compactive pressure imposed on soils by grazing animals is a function of an animal's foot size, mass, and kinetic energy. Nobel and Tongway (1986) estimate that the static pressure exerted by sheep weighing between 40 and 55 kg with a total foot area of 84 cm² is 48 to 65 kPa.

land-resource use was optimised. Further, the unique environment of the continent posed adaptation problems for European settlers whose farming and animal husbandry practices were compatible with climates and soils very different to that of 19th-century Australia. As a result, even where earlier settlers or scientists identified problems of soil degradation (Powell 1997) it is unlikely that they were able to establish a clear link between this outcome and the expansion of wool production. However, even if this link were recognised at the time, understanding of the long-run effects of such economic activity on the degradation of land resources would have been limited.

As squatter settlement on the Australian frontier expanded, it also contributed to biodiversity loss via habitat destruction and modification. Lunney (2001) argues that during the initial period of pastoral expansion, native species extinction reached epidemic proportions. The introduction of sheep grazing contributed to this biodiversity loss as species competed for available resources, while overgrazing led to significant habitat destruction. The large-scale operations necessary for sheep production in low rainfall areas, combined with rapid growth of herbage after rain, induced graziers to overstock (Lunney 2001). Moreover, the introduction of non-native species, particularly rabbits, had devastating effects on the natural flora and fauna of the country. Myers et al. (1994) argue that the sequence of events European settlers and their animals set in train during a succession of pastoral occupation was the most important factor in aiding the spread of the rabbit. It is unlikely that early settlers, unfamiliar with the climate, flora and fauna of Australia, could have predicted the negative externalities created by the introduction of non-native species.

Another aspect of sheep grazing that negatively affected Australia's natural assets was the result of soil erosion as deep-rooted native vegetation was lost due to sheep consumption. Losing topsoil means loss of nutrients required for plant growth, thereby reducing coverage and, in turn, the income derived from the asset. Nevertheless, this process also causes the build-up of sediment in waterways, affecting fish and other aquatic species habitat in different ways. For example, sediment fills in the natural variations of a river's bottom, affecting the growth of food sources for various species (Victorian Department of Primary Industry 2013). The process of sedimentation can take decades or centuries to appear downstream (Wasson & Sidorchuk 2000). The challenge for current and future generations is to determine methods of improving land quality in some locations, but also to effectively remove non-native species from competing with natives as well as limit soil erosion. In fact, the continued prosperity of the nation may well be bound up in the

collective ability to manage the long-run environmental costs associated with early economic success.

Gold

Gold was discovered in New South Wales and Victoria in the last decade of the 1840s, with the 'official' rush deemed to have begun in 1851 (Blainey 1961). After the official proclamation of gold discoveries a rush of population to the diggings ensued. However, unlike the gold discoveries in California only three years before, where miners themselves designed property rights (Umbeck 1981; Zerbe & Anderson 2001), the Australian colonial governments played a critical role in establishing property rights as well as law and order on the goldfields (La Croix 1992).

Gold: land and water rights

The rush to strike it rich created a significant challenge for colonial officials in relation to law and order and to preventing a substantial fall in labour available for other urban and rural industries. Initially, the allocation of land rights on the goldfields was aimed at limiting the costs of law and order and reducing the negative consequences of population relocation. To achieve these dual aims, authorities introduced a gold mining licence costing 30 shillings per month. Licences were non-transferable and issued only to those who could show that they were not 'improperly absent from hired service' (La Croix 1992, p. 207). Goldfields Commissioners were appointed to issue and enforce licences and settle disputes. The aim of the licensing system was to create barriers to entry for mining and thereby limit the drift of labour from other industries. During the early expansion of mining, the licence fee met with resistance and, as the costs of the licence fee rose, public discontent increased. Even if the cost of the licence remained constant, as competition increased, there was a proportionate fall in the likelihood of finding payable gold, thereby adding to the burden of the fee. Specifically, the licence acted as a tax on miners so as the probability of 'striking it rich' fell, the proportionate cost of the tax rose. For example, La Croix (1992, p. 209) notes that the cost of the licence fee increased over the two years following 1852 while average miner income fell by more than half.

In addition to the licence fee, government regulation dictated the size of claims on each field – originally limited to eight foot by eight foot. These small claim sizes during the early period of the rush allowed more prospectors to enter mining than would otherwise have been the case. Nevertheless, as the

chances of finding alluvial gold fell, small claim sizes imposed increasing costs on miners. Combined with the growing cost of the licence fee, the situation quickly escalated to serious conflict between authorities and miners. Miners' initial demands were for legislative representation so that they would be able to influence the costs of mining licences as well as the overall administration of the goldfields. This political agitation reached its peak in 1854 at Ballarat (Victoria) with the Eureka Stockade, when armed conflict between miners and the military ensued. The result of this conflict led to the licence system being replaced by a miner's right and with it the right to vote. Further, goldfields administration underwent fundamental change with the introduction of Mining Boards whose members were elected annually from the representative population by the miners themselves. Once established, these boards oversaw the adaptation of site-specific rules associated with many aspects of mining, including claim size, which, on most fields, rose significantly.⁷ These changes accompanied a fall in the supply of alluvial gold and an associated increase in investment required to sink shafts to follow deep veins where the continued application of small claim sizes would have acted as a disincentive for such investment (Bate 1988).

Aside from the administrative problems associated with early constraints on claim size and the costs of mining licences, access to water was also a problem for gold-mining officials. Water was an essential input to the mining process, primarily used to wash gold-bearing gravel (Harris 2013b). Nevertheless, suitable water sources were often located at considerable distances from mine sites, thereby requiring substantial investment in channels to move water to mines. As noted in the 'Irrigation' section below, water rights in the pastoral industry were dominated by the riparian doctrine that gave squatters the means by which to insulate themselves against climate risks by practising transhumance where access to water on each parcel was guaranteed. In the case of gold mining, however, the application of riparian rights would have led to an underinvestment in mining effort. This is because without guaranteeing constant use of a predetermined share of water from a specific source, individuals would not obtain a return on their sunk costs (Harris 2013b). Instead, prior appropriation was adopted on the goldfields, originally established by custom and later codified in legislation. Rules accompanying prior appropriation, including forfeiture for non-use, seniority and transferability, acted to enhance the doctrine's efficiency in gold mining

7 For example, an 1862–63 Victorian Royal Commission noted by-laws had enlarged claim sizes by 227 times the original 8 foot by 8 foot claim established under legislation (Humffray, McCoy & Mollison 1862–63, p. 764).

(Harris 2013b). A critical aspect of this doctrine was that it was exclusively applied in the mining industry and, in the case of disputes with other users, miners' water rights were generally considered subordinate to those of other claimants.

Gold and resource degradation

Just like the spread of pastoral occupation on interior lands, mining was associated with obvious and significant impacts on the surrounding environment. The digging of deep shafts and pits had significant long-term impacts on Australia's environmental assets that, in many cases, are still recognisable today (Garden 2001). Nevertheless, there are very few studies that examine the impact of the Australian gold rushes on the natural environment (Frost 2013). The three main environmental consequences of gold mining during this early period of exploitation were water pollution, the destruction of native vegetation, and the creation of large mullock heaps (waste tailings). Water pollution resulted from the washing of sludge and debris into local watercourses, the effects of which impacted not only the immediate mining site but also land downstream. For instance, at the Omeo mine tailings were delivered by gully to Livingstone Creek, which became blocked, resulting in the submersion of cultivated land downstream (McGowen 2001). Victorian authorities investigated the problem as early as 1886 and found the damage caused by mining debris was more significant than previously supposed and there was concern it would accelerate in the future (McGowen 2001). By the early 1900s, the problems had become so magnified that the issue was a topic of political debate (Boucher & Powell 1994; McGowen 2001). As a result, in both New South Wales and Victoria Sludge Abatement Boards were established to regulate the disposal of mining waste and prevent further damage to waterways and agricultural land.

Aside from water pollution resulting from the need to wash gold-bearing gravel, natural resources on and around mining sites, such as native vegetation, were considered impediments to production. Vegetation was often cleared by burning large tracts of land on and around goldfields, affecting about a quarter of Victoria (Frost 2013). Removal of native vegetation also meant the elimination of many native birds and animals as habitat destruction accelerated over time (Garden 2001). Further, as shaft sinking increased so too did logging, with timber a valuable source of fuel to power hydraulic pumps (McGowen 2001). Digging deeper and on a larger scale also resulted in the creation of large mullock heaps dotted across the landscape (Frost 2013; Powell 1989). However, as in the case of environmental degradation caused

by pastoral occupation, the main question associated with an assessment of mining's negative externalities is whether the extent of degradation it caused was optimal given the economic and technical realities of the period. Determining whether this was the case requires detailed information about the costs associated with degradation and comparing this with the benefits of gold production. Unfortunately, while the immediate costs of degradation in the form of waterway pollution and vegetation destruction were obvious, the longer-term ecosystem changes are more difficult to quantify. This is because the long-run costs of these alterations to Australia's environmental assets need to be disentangled from naturally occurring modifications over multiple generations. Based on the evidence available, it would likely be difficult to argue that the economic benefits associated with gold mining in the mid 19th century were lower than the costs of environmental damage that accompanied this activity.

Politics

Aside from the economic upheaval resulting from gold discoveries in the south-eastern colonies, 19th-century colonial politics also underwent fundamental changes. In just 70 years political changes ushered in a shift from an autocratic military government to a fully fledged democracy with universal male suffrage and the secret ballot. A detailed analysis of political change is beyond the scope of this chapter; however, it is important to note that in the unicameral parliament the ability to vote and be elected to parliament was restricted to those meeting certain property requirements. Holding a squatters lease was sufficient to qualify to vote and become a member of parliament. As a result, squatters were able to secure significant *de jure* political power in the colony. The governor retained considerable powers in that if he did not approve of the Council's action he could dissolve the parliament, forcing another election. This was the state of colonial politics on the eve of the gold rush.

The politics of land reform

After the discovery of gold, a huge influx of migration followed that doubled the New South Wales and Victorian populations by 1860 (Caldwell 1987). Paralleling this, three important changes took place. First, in 1850 the British parliament passed the Australian Colonies Government Act (13 & 14 Vic. c. 59, 1850) granting the colonies responsible government, thereby conferring on them rights to draft their constitutions, controls over colonial revenue,

and powers to determine all domestic policy, including land policy. Second, from 1840 onwards convicts were no longer sent to New South Wales, with transportation officially abolished in 1851. Finally, in 1850 and 1859 respectively Victoria (the Port Phillip District) and Queensland (the Moreton Bay District) were excised from New South Wales, becoming independent colonies.

The New South Wales Constitution came into effect in 1855 (19 Vic. No. 183) and established a bicameral parliament with a fully elected Legislative Assembly (lower house). Franchise was limited to individuals owning a freehold estate valued at £100, leasehold estate valued at £10, or a miner's right. These changes allowed the newly enfranchised miners to play a role in diluting the *de jure* political power of conservative interests (squatters) that had dominated the unicameral parliament. In turn, more radical liberals, supported by wealthy urban constituents, were elected to the Assembly. The Legislative Council (upper house) was comprised entirely of governor-nominated representatives serving five-year terms. A number of these nominees were wealthy squatters (Hawker 1971).⁸ By 1858 the Assembly's liberal majority passed legislation extending suffrage to all males over 21 and introducing the secret ballot. The introduction of democratic reform was accompanied by a fall in the supply of alluvial gold, causing a decrease in the opportunity cost of former miners moving to the New South Wales and Victorian pastoral frontiers. As a result, universal suffrage was accompanied by the demand for land reform led by the New South Wales and Victorian Land Leagues (Alston, Harris & Mueller 2011). McMichael (1980) argues that the power of land reform ideology was decisive in attracting the recently enfranchised working class, including miners, once alluvial gold was gone, to the liberal cause. In turn, the issue of land reform became the key policy determining election outcomes and, thereby, control of the colonial parliament. Powell (2006, p. 19) refers to the 1860 New South Wales election as the 'election for selection'. By 1861 these political developments led to the introduction of land reform aimed at reallocating squatters land to small farmers. This reform was achieved by the *Crown Lands Alienation Act* (23 Vic. No. 4, 1861).

This legislation allowed individuals to select sections of land before survey and created government-sanctioned competition for a large proportion of squatters' pastoral holdings. Selection opened all lands in the colony

8 Responsible government had reduced the governor's powers and while he still retained the right to reserve acts for the Royal Assent as well as to dissolve a parliament, the role became greatly diluted (Clune & Griffith 2006). Moreover, while the governor remained responsible to the British Secretary of State, he acted primarily on advice from the Executive Council, thereby being subject to the whims of parliamentary majorities.

not owned by freehold for conditional purchase. Claims were limited to a maximum of 320 acres, with payment deferred for three years so that on application individuals only paid a 25 per cent deposit of £1 per acre. Full payments were due at the end of three years from the claim date. Selectors were required to reside on the land for one year and make investments to improve the land, such as erecting fences and buildings, valued at £1 per acre.

In the same year further changes to the laws governing squatter occupation took place in the form of the *Crown Lands Occupation Act* (25 Vic. No. 2, 1861). Under this legislation squatters retained leases for a maximum of 14 years at the frontier (unsettled districts) and pre-emptive rights to purchase 640 acres for every 16 000 acres of leased land, at £1 per 640 acres.⁹ If they exercised pre-emptive rights, they could lease three times this area for a maximum of 14 years, with rentals determined by stock-carrying capacity. Moreover, squatters could also undertake conditional purchase in accordance with the *Alienation Act*. In other words, the maximum area of a squatter's land claims at the frontier could be 4080 acres, plus 320 acres if they filed for selection. This was less than 15 per cent of the average 34 000 acres a New South Wales squatter occupied in the 1840s (Roberts 1935, p. 28). These attempts to curtail pastoral occupation led squatters to redirect resources to evade redistribution (Alston, Harris & Mueller 2011; Morris & Ranken 1883). Nevertheless, although this phase of land reform was widely considered a failure, it encapsulated a desire by legislators to establish small, geographically concentrated family farms on interior lands. By the end of the 19th century more concerted efforts by colonial governments to establish small settlers on the land were made and this policy became known as closer settlement.

One of the major failings of closer settlement policies in their various guises, including Soldier Settlement in the 1920s and 1940s, was that rents were high and blocks were often too small to provide a sufficient grazing area (Holmes 2000). Further, in some locations extreme climate variability made permanent agriculture almost impossible without the provision of more certain water supplies. The demarcation of Goyder's Line in South Australia provides a stark example of the impact of climate on agricultural enterprises in the more arid parts of the country. In that particular instance the government surveyor, George Goyder, determined the geographical limits of sustainable agriculture in the mid-1860s (Meinig 1961). In the years that followed, however, pressure to attract migrants increased and rainfall north of the line

9 Lands in New South Wales and Victoria were divided into three classes for the purposes of squatting leases: unsettled, intermediate and settled. In the latter two squatting leases were available for eight and one years respectively.

appeared to support greater levels of agricultural settlement in these areas. Political pressure led to the removal of this constraint on settlement in 1874, but by the end of 1880 poor winter rain marked the beginning of several low rainfall years that wiped out all but a few of the grain farmers that had settled north of Goyder's Line (Greasley, this volume). By 1882–83, wheat output fell to 50 per cent of the 1879–80 level and the average yield in the colony was just over four bushels per acre (Meinig 1961, p. 212). The economic and social cost of this failure was large but so too were the environmental costs as agriculture had destroyed or deteriorated the soils by removing native vegetation and encouraging erosion in areas that were once suitable for wool production.

Similar problems associated with climate uncertainty posed difficulties for Victorian policymakers in their attempts to settle small agriculturalists, particularly in the northern interior. As a result, after selection was introduced in the 1860s, it was not long before the lack of reliable rainfall in many areas threatened the continued prosperity of small settlers generally and the colony more broadly, leading to political pressure for the government to intervene (Harris 2008). Alfred Deakin, Victoria's first Minister for Water Supply, was instrumental in this process of institutional change and was responsible for designing the administrative model used to manage irrigation expansion in the late 19th century. The effects of the rise of irrigation are discussed below.

Irrigation

Although early efforts to break up squatters' land monopoly using selection were considered failures, they did result in a considerable increase in the number of small farmers in Australia's interior. This was particularly true in Victoria, where a greater number of small settlers were established by the late 1870s. Figure 23.1 illustrates the growth in rural establishments in Victoria compared with New South Wales from 1850 to 1900, with the former colony showing a greater increase from around 1870 until 1890. Nevertheless, by the late 1870s these farmers, especially those located on the northern plains, began to face significant costs associated with drought due to an underinvestment in infrastructure to shore up surface water supplies. This threatened the continued expansion of permanent agriculture, leading to demands for the introduction of irrigation. One striking feature of the spread of irrigation during this early phase was that Victorian policymakers were first movers. In that colony legislation facilitating irrigation was adopted as early as 1882, but these initial efforts failed to effectively create a viable irrigation industry.

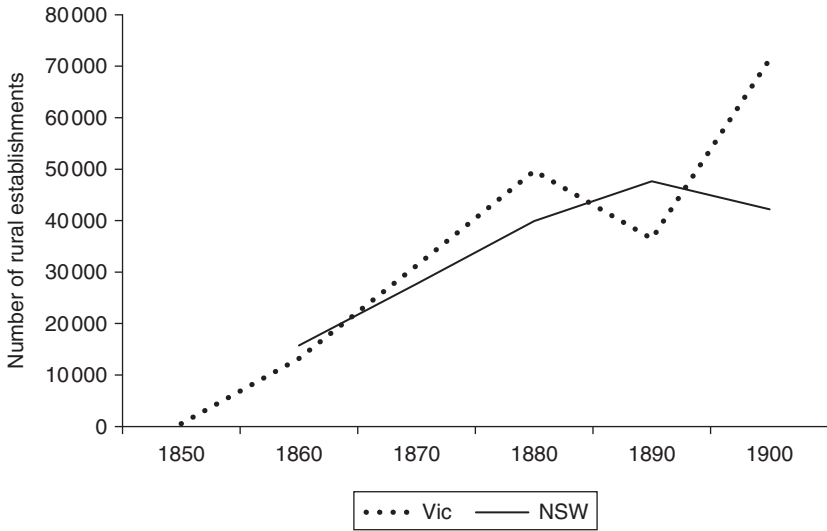


Figure 23.1 Number of rural establishments in Victoria and New South Wales, 1850–1900
Source: Graph compiled using data from Davidson (1987).

By 1886, however, Victoria had implemented full-scale, government-sponsored irrigation across the colony. In New South Wales the introduction of irrigation took a further 30 years to be implemented. In part this was a result of the slower uptake of land by agriculturalists in the more arid regions like the Riverina where grazing remained the dominant activity. In Victoria the risk associated with climate variability in the dry northern regions was clearly established in the early 1880s and policymakers recognised the substantial threat this posed to economic growth that relied primarily on the expansion of agriculture (Harris 2007).

Agriculture and water rights

The introduction of irrigation was accompanied by a shift from riparian rights to government control of all water sources in Victoria. Although this occurred over several years, by 1884 the rights to all water in the Victorian colony were vested in the Crown. Irrigation aims were twofold: to ‘drought proof’ farmers and support continued agricultural expansion that underpinned the state’s economic development (Harris 2007). Over much of the 1880s, irrigation organisation and administration were determined locally within each district. Nonetheless, poor infrastructure construction and the

inability to acquire sufficient water supplies to generate revenue meant many irrigation districts failed to obtain adequate revenue to meet even the interest on government loans. The failure of decentralised administration paved the way for the Victorian government to take over the responsibility of managing and expanding the irrigation system that began under the auspices of the SRWSC in 1905. In New South Wales this institutional design was mirrored in 1915 with the creation of the WCIC. Both organisations determined access to, and the price of, water and their approaches were broadly similar in nature; however, for ease of exposition the following discussion focuses on the approach of the SRWSC.

The SRWSC distributed water on a one-for-one basis, meaning that for every acre deemed irrigable, an acre-foot of water would be allocated. However, the SRWSC determined the extent of irrigable land without reference to many important geographical and environmental factors, such as topography and soil type. This resulted in some farmers experiencing an underallocation of water while others had an overallocation. Moreover, water rights were tied to the land so that they could not be sold as a separate commodity. Combined with the inability to trade water, the result was a misallocation across farms. Farmers were required to pay for a minimum volume of water even if they did not utilise it. In turn, overallocations and the minimum volume both contributed to the problems of overuse that plagued the system. The main reason for the minimum volume requirement was to ensure that sufficient revenue could be generated to cover the costs of supply, management and maintenance of the system. Nonetheless, prices were set below marginal cost so that, over time, the SRWSC became revenue-poor but successive governments refused to allocate it more funds (Harris, Brooks & Dharmaratna 2012). Plagued with other problems, such as overallocations, minimum volume requirements and limited revenue to maintain the system, central planning led to significant environmental degradation of both private land and river systems (Harris 2007).

The rise of salinity

Beginning in the 1960s, the level of in-stream salinity, particularly in the Murray River, was increasing the costs of filtering domestic water supplies incurred by the South Australian government in supplying Adelaide (Harris 2007). Prior to this, comprehensive monitoring of the in-stream salinity of multiple Victorian rivers was not consistently undertaken. Nonetheless, one set of data collected by the Murray–Darling Basin Commission between 1939 and 2003 measured salinity levels in the Murray River at Morgan, South

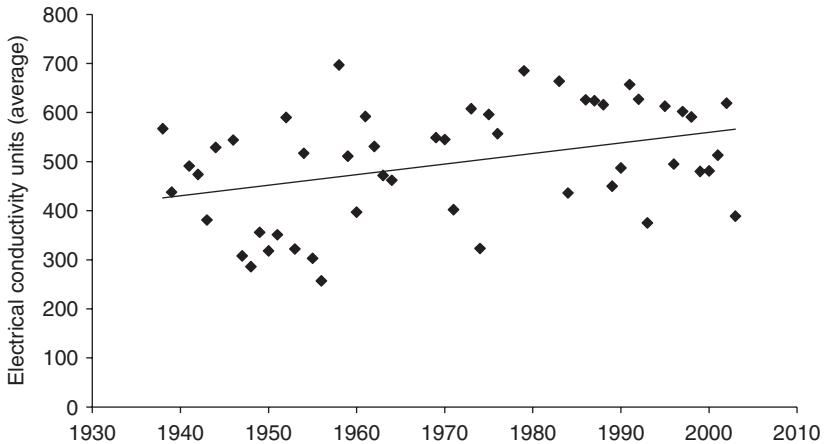


Figure 23.2 Salinity levels in the Murray River, 1938–2003

Source: Adapted from Harris (2007).

Australia, located just before the Morgan–Whyalla pipeline offtake that supplies Adelaide. Application of a simple, ordinary least-squares linear trend line, shown in Figure 23.2, indicates the presence of an upward trend (Harris 2007). The results of this analysis should be interpreted with caution because large variations in these data make it difficult to prove the existence of an underlying trend. A more detailed examination of salinity levels by Cunningham and Morgan (1983), however, lends broad support to the findings that salinity was increasing during this period.

Over the next few decades, downstream farmers along the banks of the Murray faced production constraints brought about by high in-stream salinity levels that resulted in a corresponding fall in income. In-stream salinity affected all crops to some degree but its effects on more alkali-sensitive crops, such as citrus fruits and grapes, posed serious concerns for producers. By the middle of the 1970s, state governments had begun to include environmental quality assessment in their approaches to water management, and in the following decade there was growing concern at the extent to which salinity was affecting farm incomes. At the state, and later federal, level this concern manifested itself in a move away from centralised water pricing and allocation towards regional governance. In the late 1980s and early 1990s this shift was accompanied by the introduction of water markets, which allowed water to be sold separately from the land to which it was attached.

Water markets permitted the reallocation of this input from low- to high-value uses, thereby creating more efficient use of this scarce resource. In turn, these markets generated large surpluses in excess of \$2.5 million (Brooks & Harris 2008). Farmers were able to adjust their production profiles to move between dryland and irrigated farming, thereby gaining more flexibility in choice of inputs. For example, the Pyramid–Boort region of Victoria is a net seller of water and this has been reflected in a shift towards greater reliance on dryland farming methods (Murray–Darling Basin Authority 2010). The ability to trade water has also allowed structural adjustment to occur where less efficient farmers could exit the sector. Path-dependent effects have created some constraints on the system due to infrastructure bottlenecks and regulatory restrictions. Infrastructure bottlenecks act to prevent efficiency-enhancing trades from occurring because they limit the system's capacity during peak irrigation periods. For example, a bottleneck occurs at the Barmah Choke which creates price premiums between trading zones. Government regulations also prevent efficiency-enhancing trades, for instance, by restricting the net volumes of water trades out of any one district in one season to prevent the creation of stranded assets (Brennan 2006; Brooks & Harris 2008; Victorian Auditor-General 2004). However, a recent study by Brooks, Harris and Joymungul (2009) indicates that even in the presence of these constraints on trade, the largest water market in Australia, Watermove, shows a similar depth to more advanced stock markets.

The spread of irrigation and the early institutional arrangements used to price and allocate water resources contributed to the rise of both on-farm and in-stream salinity because it prevented farmers from altering their input mix. On-farm salinity results from the lack of graded paddocks and overuse of water that pools in uneven surfaces, leaching into the water table. Over time, this leads highly saline water tables to rise, bringing salt to the surface and thereby reducing the productivity of sections of land. Successive watering flushes this excess salt back into the river system, contributing to in-stream salinity. The removal of deep-rooted native vegetation to produce agricultural crops has also contributed to rising water tables. Further, saline groundwater discharges into waterways, adding to in-stream salinity. These effects are exacerbated by a lack of drainage, and historically, the budget constraints faced by state irrigation agencies meant drainage facilities were underprovided in many districts (Harris 2007). Higher in-stream salinity imposes costs not only on downstream irrigators but also on the native species that rely on the river systems for survival. In-stream native species are also negatively affected by rising salinity levels because saline pools form in areas of

deep water where saline groundwater intrudes into a river's channels. At the same time upstream flow passes over these pools so salinity on the bottom may be higher than the surface (Natural Resources and Environment 2001). The extent to which this affects any one species depends on their natural level of tolerance for saline water.

As was the case for wool producers in the 19th century, in the early years of expansion irrigators did not have sufficient information on the environmental consequences of their resource use. However, by 1937 it was recognised that the compulsory minimum volume charge encouraged overwatering in many Victorian irrigation districts, leading to salinity problems, and a Royal Commission investigation stated:

A ... defect of the system of water rights is the natural tendency on the part of irrigators to use the quantity of water for which they are required to pay, irrespective of its effects on the land. (McClelland et al. 1937, p. 24)

Yet little political effort was made to remove the perverse incentives created by the administrative approach to water pricing and allocation (Harris 2007). It was only over time that the extent of the damage became a concern for both farmers and governments alike. The introduction of water markets may go some way to combating the incentives for overuse that prevailed under centralised management by allowing farmers to be flexible in their input choice. Nonetheless, continual improvements in information on the effects of salinity for the wider ecosystem will be needed to ensure future mitigation policies create appropriate incentives to limit further salinisation of waterways. As such, there is a potential that reliance on irrigated agriculture compared with dryland farming may fall overtime, thereby going some way towards preserving Australian riverine environments. Moreover, similar to the case of land degradation caused by wool grazing, the prosperity of future generations will, in part, be determined by their ability to alleviate the environmental damage caused by early economic success.

Conclusion

Australian economic success in the early period of European settlement relied heavily on exploiting the comparative advantage of the pastoral sector. Wool production was eminently suited to the 19th-century endowments settlers were confronted with, including a temperate but highly variable climate, abundant supplies of grassland and relative labour scarcity. Initial land and water policies supported pastoral growth by allowing large landholdings

scattered across geographically dispersed regions and access to water on all land for which squatters had a licence. Over time, population expansion led to extension of the franchise, resulting in alterations to land policy in favour of small, permanent farmers compared with large squatter holdings. These shifts resulted in the rise of more permanent forms of agriculture that could not be successful unless action was taken to minimise the impact of climate variability on crop production. Irrigation was the key method by which this was achieved and it contributed to the continued prosperity of the nation by 'drought proofing' farmers in the more arid interior. The adoption of irrigation was accompanied by centralised water allocation and pricing, leading to inefficiencies in the system that, in recent years, governments have attempted to correct through the introduction of water markets. In both contexts – wool production and irrigation – some environmental degradation occurred and imposed costs on the Australian economy, potentially acting to reduce growth levels. However, it is only in recent years that the effects of these negative externalities have been widely recognised and measures taken to combat their impacts. The details presented in this chapter on the evolution of property rights governing the exploitation of Australia's principal natural resources, land and water, and on the associated environmental costs illustrate the environmental challenges facing the nation in the 21st century.¹⁰ The continued economic success of the country is inextricably bound up in both the exploitation of the environment and its protection from further harm.

¹⁰ For further extensive discussion on the aggregate measurement of the environmental impacts of resource use in Australia, refer to ABS (2013e) and Hamilton (1997).

Refiguring Indigenous economies: a 21st-century perspective

JON ALTMAN AND NICHOLAS BIDDLE

Introduction

The Aboriginal and Torres Strait Islander people of Australia (or Indigenous Australians) have been excluded from grand narratives of the economic development of the continent since British colonisation. The Indigenous story has been assigned to barely a footnote, which is summarised as follows: Post-Enlightenment colonists with a superior western economic system and institutions and superior military might found dispersed and impoverished small-scale hunter-gatherer groups scattered across the continent with no recognisable forms of land tenure, property rights or political systems. Land was expropriated for more productive purposes. In his critical interpretation of the history of settler colonialism, Patrick Wolfe (1999) notes that colonial society was premised on displacing Indigenous people from their land and their elimination. In the brutal clashes between British settlers and Indigenous nomads on the frontier, there were winners and losers; and thus the Australian nation was born without any apparent Indigenous contributions.

In this chapter we explore the Indigenous economic contribution from a comprehensive historical perspective. First, utilising a new economic historiography, we re-imagine Indigenous economies in the period 1850–1970. A little like the new history of frontier violence, a story of diverse economic histories emerges from the recent scholarly focus on the archive, case studies, and oral history. Next, we look at the period since 1970 when the Indigenous economy was rendered statistically visible after efforts were made to include Indigenous Australians fully in the national census. In particular, we examine the policy focus on a form of convergence between Indigenous and non-Indigenous socioeconomic outcomes as measured by statistical indicators that reflect the normative criteria of the dominant society. Third, we use a spatial perspective to examine what we term ‘a land-titling revolution’ that

has seen the return of one-third of the Australian continent to traditional owners living mainly in remote areas; we also assess old and new economic development opportunities that might be linked to this restitution. Finally, we consider different policy approaches and discuss future options that might better suit diverse Indigenous circumstances and aspirations in the 21st century. We end by examining the transformative possibilities that are today emerging for Indigenous economies.

A forgotten economy re-imagined: 1850–1970

The contribution of Indigenous people to the development of the Australian economy has at times been assumed to mirror their demographic decline. Mulvaney (2002) estimates a population of 750 000 to 800 000 at the time of European colonisation (Hunter, this volume). By the 1901 Census and Federation, this had declined to only 100 000 or slightly less (Smith 1980, p. 12). In 1971 around 116 000 Indigenous people were counted in the census, indicating a slow and probably intermittent growth of the population (Altman & Nieuwenhuysen 1979).

Our understanding of Indigenous people and their economic circumstances is severely handicapped by an absence of accurate statistics or documentation about Indigenous participation in Australian economies. This is partly because from 1901 Indigenous people who were not categorised as citizens were excluded from the national census under section 127 of the Constitution of Australia.

There is, however, an emerging new economic historiography that is re-envisioning the diverse forms of Indigenous participation in the colonial and subsequent national economy. A recent project, *Indigenous Participation in Australian Economies*, led by the anthropologist Ian Keen and the economic historian Chris Lloyd, is an exemplar (Keen 2010a; Fijn et al. 2012). The researchers have used a creative patchwork of sources, including official archives, oral history material gathered in the field, and a growing literature by Aboriginal authors relating to personal employment histories and family histories. These approaches allow Keen and Lloyd (2012), and their contributors, to look beyond an ideology of modernisation and make the role of Indigenous Australians far more visible in many sectors of the economy. In particular, they reveal articulations between Aboriginal economies on the one hand and market capitalism and state colonisation on the other.

Given the slow expansion of the settler colonial frontier across the massive Australian continent – what Reynolds (2013, p. 248) has described as one

of the greatest appropriations of land in world history – it is unsurprising that diverse Indigenous participation in colonial economies resulted. Such diversity was documented in the 13 volumes of the Aborigines in Australian Society project, with Charles Rowley's (1970, 1971a, 1971b) Aboriginal Policy and Practice trilogy fundamentally altering understandings about Indigenous involvement in the settler economy. In particular, he distinguished between what he termed the *Outcasts in White Australia* (1971a) on the one hand, and *The Remote Aborigines* (1971b) on the other, thereby establishing an enduring division of the continent based on settler population density, climate, commercial productivity of the land and the nature of administration. Rowley's distinction was between 'colonial' and 'settled' Australia; today, this binary has shifted discursively and the distinction is between remote and non-remote or even 'north and centre' and 'south'. This distinction, as we will show later, has acquired new significance in the eras of land rights and native title.

Another volume, *Aborigines in the Economy* (Sharp & Tatz 1966), brought together, probably for the first time, participants from a wide range of fields, including Aboriginal people and advancement groups, the mining industry, mission societies, the pastoral industry, parliaments, federal and state administrations, trade unions and academics, to examine labour market issues. Contributions to this volume made very visible Indigenous seasonal employment in the pastoral (cattle) industry and in mining, but also openly addressed, possibly for the first time, broader problems of population distribution and links between poor Indigenous vocational training and health status on the one hand and low Indigenous employment and wage levels on the other.

A revealing project from this time deserves highlighting. Diane Barwick (1973) meticulously studied Aboriginal farm developments at Coranderk in Victoria and Cumerogunga in New South Wales between 1859 and 1928. Both farms generated considerable revenue as Aboriginal-run enterprises that produced wheat, wool, dairy products, hops and crafts (Pascoe 2008, pp. 117–72). Interventionist state policies saw the removal of 'half-castes', the reappropriation of specially allocated land as being too valuable for Aboriginal ownership and management, and increasing power given to Aboriginal Protection Boards. These measures combined to undermine the viability of enterprises and resulted in the ultimate abandonment of farming.

A similar venture has been documented by Peggy Brock (1993) at Poonindie Mission on the Eyre Peninsula in South Australia, where by 1860 a successful farm of 15 000 acres of leased land carried livestock and produced wheat and oats. But again, pressure was placed on the government to have such fertile

land subdivided and by 1894 the lease was surrendered and Aboriginal people were relocated to other missions.

Documented Aboriginal community ventures like these that could engage competitively in the new capitalist order in the late 19th century were undermined by state authority responding to settler greed for fertile land; they failed because of interference and undermining, not because they were uncompetitive.

Somewhat different was Aboriginal participation in maritime industries, especially open-access fisheries. Bennett (2007) examines Indigenous fishing from the pre-colonial period until the end of the 19th century and shows how fishing offered a means for Aboriginal people in the Illawarra and Shoalhaven regions to partly maintain economic independence in the face of colonisation until the late 19th century. Bennett (2007, p. 99) notes that the rivers and sea were not alienated from their Aboriginal owners and so fishing continued, eventually to decline because of the movement of people rather than an inability to successfully engage in subsistence and small-scale commercial fishing.

What is most innovative in the recent economic history is the plurality of theoretical approaches that explain the articulation between Indigenous economies and colonial and postcolonial economies. Keen (2010b, pp. 7–8) suggests that the three most influential approaches are internal colonialism, welfare colonialism and the concept of hybrid economy. The first, mainly applied to the pastoral industry, but also mission economies, recognises that Indigenous modes of production were conserved to underwrite the maintenance and reproduction of the labour force. The second approach mainly applied in government settlements and missions where a dependence on welfare transfers initially paid to third parties was fostered as a means of social control. But with time such bureaucratic practices declined. Altman and Sanders (1991, p. 3) note that the exclusion of Aboriginal people from the benefits of the Australian welfare state began to be dismantled from the middle of the 20th century. This was partly because welfare payments were controlled by the federal Department of Social Security, which exempted more and more Aboriginal people from state and territory legal controls.

The third and most innovative theoretical approach is the ‘backcasting’ adaptation of the hybrid economy model developed by Altman (2012) for contemporary remote Indigenous communities to the variety of local economies that emerged on the frontier. This model evolved from the inability of current economic theory to recognise the resilience of the customary or non-market sector in late modernity or to appreciate the complex articulations

between market, state and customary sectors. As Keen and Lloyd (2012, p. 3) note, Altman takes the hybrid economy model to be dynamic and flexible, both spatially and temporally and to be more complex than is immediately apparent. Used historically, the hybrid economy model shares similarities with internal colonialism theory, but it has the capacity also to incorporate the role of the state and processes of governmentality.

Keen (2010b) documents a rich historic literature of Indigenous engagement with specific sectors of the settler capitalist economy: in sealing, pearling, trepang fishing and commercial fishing; in the cattle industry and shepherding; in farm labour; in the buffalo industry; in mining; in domestic service; and in the sexual economy. Contributors to the *Indigenous Participation in Australian Economies* volumes traverse sectors as diverse as cameleering; commercial agriculture, in particular seasonal labour; dingo culling; prison security; tourism; and the state railways and sugar cane farming, both of which employed Torres Strait Islanders. To this can be added participation in sports (Bamblett 2013), in music and cultural industries (Dan & Neuenfeldt 2013) and in early Aboriginal mining enterprises in the Pilbara (Holcombe 2006).

Some of these activities were crucial to Australia's development as a nation. Kidd (2012, p. 172) provides archival evidence of a rapid growth in employment of Aboriginal labour under state control in rural industries in Queensland where white labour was scarce throughout the 20th century. At the same time, though, she documents poor labour conditions, under-award pay rates, the contracted labour system that only provided workers with a proportion of their wages, and government mismanagement of savings and trust funds. Kidd (2012, p. 177) notes that the federal and all state governments ran contract labour systems and maintained banking controls, and highlights the issue of stolen wages as a 'national scandal'.

Each colony developed distinct policies towards Aboriginal people; all enacted special laws that placed them in a separate legal category from colonial citizens. New 'protection' laws often corralled persistent remnant populations on reserves. Legal and administrative mechanisms were established by colonial, and then state, governments, to ensure a high degree of control over Aboriginal subjects, usually by public officials deemed 'protectors'. Much oversighting responsibility was delegated to third parties like missionaries and employers, but many Indigenous people slipped through the 'protection' net, living either an unsanctioned existence on the fringes of settler society or beyond the frontier in remote areas of the continent (Altman & Sanders 1991, p. 1).

The initial reasons given for dispossessing natives of their land were diverse. Ryan (1996) analyses the texts of early explorers and finds four justifications: Aboriginal people were so savage that they could not be considered landowners; the land was *terra nullius*, belonging to no one or everyone, and there was no recognisable system of private ownership or government; the land was unoccupied at least beyond the coastal fringe; and finally, the natives as hunter-gatherers employed no agricultural practices and hence were making inefficient use of the land. But as the British Crown claimed the entire continent, so Aboriginal people were subjects of Her Majesty and had rights both to their land and the protection of the law; so why did land alienation and violence towards British subjects continue without protection of the rule of law?

One explanation is economic. Belich (2009, pp. 271–4) links increased violence to periodic booms in settler colonial development that heightened competition over resources. Aboriginal resistance threatened colonial livelihoods as well as lives (and vice versa of course). This history was acknowledged by the economic historian Tony Dingle (1988), who briefly documented both the violence of initial encounter, the destruction of the Aboriginal economy, and the subsequent forms of resistance and accommodation that resulted in the survival of Aboriginal people.

Bottoms (2013, pp. 178–9) also notes that colonial politicians were conflicted as they were early recipients of land clearings who took up pastoral runs. Their theoretical justifications for supporting appropriation were therefore influenced by personal material interests. By the mid to late 19th century these rationales for dispossession were supplemented by an additional layer – the social Darwinian belief in the ‘iron laws of evolution’ whereby the more advanced Europeans would inevitably outcompete the less advanced original Australians.

These complex processes can be generalised by deploying Patrick Wolfe’s (1999, 2006) theorisation of Australian settler colonialism as being premised, at least initially, on displacing Indigenous people from their land rather than on any need to extract surplus value from their labour. Wolfe suggests that to get in the way of colonisation, all Indigenous hunter-gatherers had to do was to stay at home and try to maintain their natural resource-dependent way of life. But then the settler colonisers came to stay and so invasion became structural rather than some historical event isolated to any particular frontier (Sydney) or time (1788).

Our aim in this section has been to highlight the tension between mainstream economic history that has rendered the Aboriginal economy

invisible and a new historiography that suggests that there was an alternate economy based on the negotiation of an Indigenous economic space, often at the frontier. In particular, the social history of Aboriginal labour documents how Aboriginal people engaged in rural economies, often under group labour arrangements, that afforded a degree of autonomy and protection from institutionalisation. This is a story of survival and resistance to incorporation through active deployment of Indigenous agency that needs more exposure. While we have no means to assess what was the dominant form of the Aboriginal economy, it is clear that Aboriginal people were not peripheral to the development of Australia after 1850. Our exploration challenges the arbitrariness of statistics as an administratively and politically generated reality that rendered the Aboriginal economy invisible. The revisionist history demonstrates a higher level of Aboriginal participation in frontier economies in more diverse ways than previously acknowledged – Aboriginal forms of economy persisted alongside new market forms, dispelling dominant depictions in conventional Australian history texts that the Aboriginal economy was maladapted to, or incompatible with, 19th- and 20th-century capitalism.

The ultimate proof of robust forms of diverse Indigenous economies during this period is that Aboriginal people survived prolonged periods of frontier warfare. Not only did they survive but after early rapid decline the Indigenous population has continually grown suggesting concomitant growth as a share of the national economy.

The Aboriginal economy rendered statistically visible

The first census of contemporary federated Australia did not occur until 1911. The enumeration strategy related to Indigenous Australians until 1971 was dominated by a specific provision in the Australian Constitution (section 127) that stated: 'In reckoning the numbers of the people of the Commonwealth, or of a State or other part of the Commonwealth, aboriginal natives shall not be counted' (Smith 1980, p. 20). The general principle was that those of less than half Aboriginal descent (even if living tribally) were fully enumerated and included in the statistics of the general population (Smith 1980, p. 34). So-called half-castes, or those deemed to have equal Indigenous and non-Indigenous parentage, were distinguished as such, while those deemed 'full-bloods' were excluded from published statistics, despite having a range of information collected about them.

Table 24.1 Indigenous census counts, 1971–2011

Census year	Census count	Change from previous census		
		Number	Percentage	Annualised percentage
1971	115 953			
1976	160 915	44 962	38.8	6.8
1981	159 897	−1018	−0.6	−0.1
1986	227 645	67 748	42.4	7.3
1991	265 459	37 814	16.6	3.1
1996	352 970	87 511	33.0	5.9
2001	410 003	57 033	16.2	3.0
2006	455 031	45 028	11.0	2.1
2011	548 370	93 339	20.5	3.8
1971–2011		432 417	472.9	4.0

Sources: ABS Census of Population and Housing (respective years).

The overwhelming ‘yes’ vote to the 1967 referendum deleting section 127 from the Constitution meant that all Indigenous people were to be included for the first time in ‘reckoning the number of the people of the Commonwealth’. The practical consequence of this was inclusion in the 1971 Census of a question on self-reported Aboriginal and Torres Strait Islander origins. A by-product of this change is that since 1971, researchers and government statisticians have been able to track the number of people who identify as Aboriginal and/or Torres Strait Islander on the self-enumerated census form. Furthermore, many Indigenous people have been recorded as part of the Indigenous enumeration strategy, which included, among other things, a Special Indigenous Form, administered by a trained interviewer mainly in remote regions. Table 24.1 documents the changing size of the Indigenous population since the 1967 referendum – from nearly 116 000 in 1971 it grew to just over 548 000 in 2011, an almost fivefold increase, at an annualised rate of around 4 per cent.

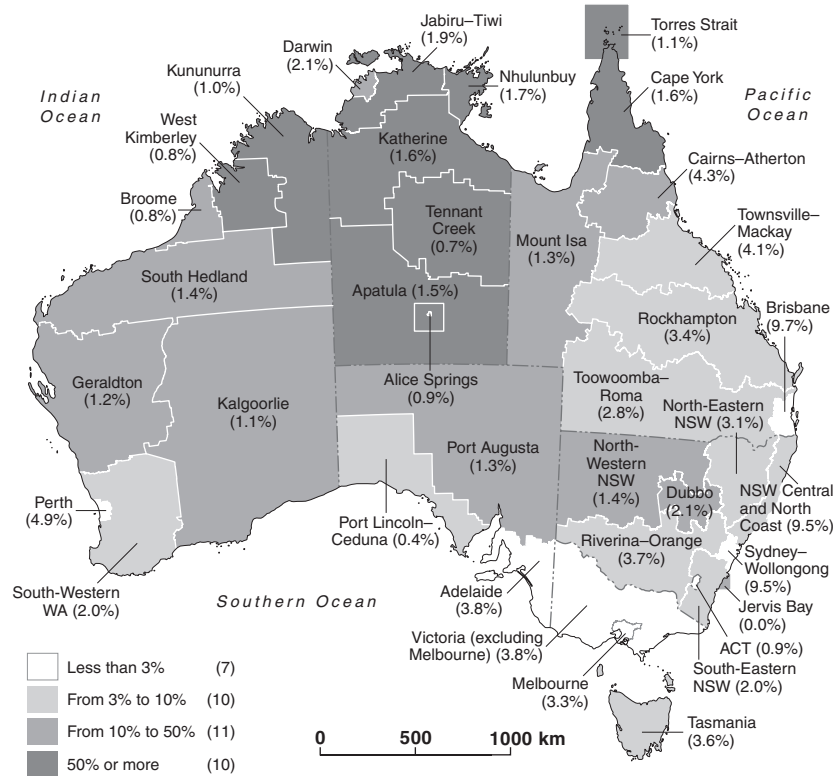
Some of this very rapid population growth was due to high fertility rates but was especially due to more people identifying as Indigenous. However, despite the promise of statistical comparisons to understand the economic as opposed to demographic history of the Indigenous population (which we explore later in this section), two major limitations remain – undercount and relevance. The first of these issues relates to the significant number of Indigenous Australians missed by the census collectors entirely (non-contact), choosing not to participate (non-response) or choosing not to answer

specific questions, including those on status (partial non-response). Although there are ongoing limitations of the census collection process (Martin et al. 2002), we know a little about the cause of this undercount and have ABS estimates of how many people are missed. In 2011 it was estimated that 17.2 per cent of the Indigenous population was missed, leading to a revised population estimate of 669 900 (ABS 2013b).

As we entered into the second decade of the 21st century, the Indigenous population was not spread evenly across the continent. We will document this in greater detail in the next section but it is worth noting that the Indigenous population is relatively remote but, in absolute terms, highly urbanised – see Map 24.1. The shadings in the map refer to the percentage of the population in a region that was estimated to be Indigenous, ranging from less than the national average of 3 per cent (the lightest shading) to more than half of the population (the darkest shading). The percentage following each Indigenous region name is the proportion of individuals in the total Indigenous Australian population who were estimated to have that region as their place of usual residence on the night of the census.

It is in remote regions (predominantly in the Northern Territory, Western Australia and Queensland) that the share of the population that identifies as Indigenous is highest. However, the regions with the greatest absolute number of Indigenous Australians are in the south and the east of the country. The Brisbane region, and the Central and North Coast and Sydney–Wollongong regions of New South Wales each have an estimated Indigenous population of 60 000 or more each, and combined make up 28.6 per cent of the total Indigenous population, roughly the same number as the total Indigenous populations of South Australia, Western Australia and the Northern Territory combined (29.1 per cent of the Indigenous population).

It is also possible to look at socioeconomic outcomes for the Indigenous population, such as employment, income, education completion and marital status. There is a long history of such analysis in academia (ranging from Altman and Nieuwenhuysen 1979 to Biddle 2013c), with the federal government and its agencies now fully involved in the process through the regular *Overcoming Indigenous Disadvantage* (2011) reports produced by the Productivity Commission. However, such analyses raise the second issue with the census in measuring the Indigenous economy, that of relevance – for example, the use of western normative criteria and converting information on individuals into household groupings and family formations that are often of mixed ethnicity (see Altman 2009). Biddle (2013a) shows that more than half of partnered Indigenous Australians have a non-Indigenous spouse,



Map 24.1 Percentage of people in region estimated to be Indigenous (shadings) and percentage of total count of Indigenous Australians (text), 2011

Source: Customised calculations using ABS Census of Population and Housing (2011).

Table 24.2 Socioeconomic outcomes for Indigenous Australians, 1971–2011

Variable	1971	1981	1991	2001	2011
Unemployment rate (% labour force)	9.0	24.6	30.8	20.0	17.1
Employment to population ratio (% adults)	42.0	35.7	37.1	41.7	44.2
Private-sector employment (% adults)	29.7	17.2	20.5	n/a	31.8
Labour-force participation rate (% adults)	46.1	47.3	53.5	52.1	53.3
Median weekly personal income (AUD, 2011)	n/a	250	282	284	362
Never attended school (% adults)	22.7	10.7	5.1	3.2	1.8
Post-school qualification (% adults)	3.2	5.0	9.5	18.2	29.5
Degree or higher (% adults)	n/a	n/a	n/a	3.3	5.3
Attending educational institution (% 15–24-year-olds)	n/a	n/a	n/a	33.4	38.8
Male life expectancy at birth (years)	49.6	56.0	57.0	56.0	
Female life expectancy at birth (years)	50.0	64.0	64.0	63.0	
Population aged over 55 years (%)	7.3	6.4	6.2	6.7	9.7

Note: 'n/a' means that the data were not available in that year.

Sources: Altman, Biddle & Hunter (2009) and customised calculations based on ABS Census of Housing and Population (2011).

with this percentage rising over the last intercensal period and reaching 80–90 per cent in many of Australia's largest urban areas. While it makes sense in certain contexts to talk about the Indigenous population as the agglomeration of individuals who so identify, it is becoming increasingly problematic to talk about Indigenous households.

The census is also quite disconnected from the form of economy that might exist on Indigenous-owned lands, especially if it includes a significant non-market or customary sector (see next section). Nevertheless, the census does allow us to compare and track statistical outcomes for Indigenous and non-Indigenous Australians crudely measured using an Indigenous identifier and assuming that mixed household formations ameliorate, but do not eliminate, socioeconomic disparities. We do this in Table 24.2, which gives a range of individual socioeconomic outcomes for Indigenous Australians, and in Table 24.3, which provides the ratio between Indigenous and non-Indigenous outcomes.

Tracking relative Indigenous/non-Indigenous changes over the past 40 years (Table 24.3) shows that relative unemployment has improved even as the relative rates of employment, especially in the private sector, have

Table 24.3 Ratio of Indigenous to non-Indigenous socioeconomic outcomes, 1971–2011

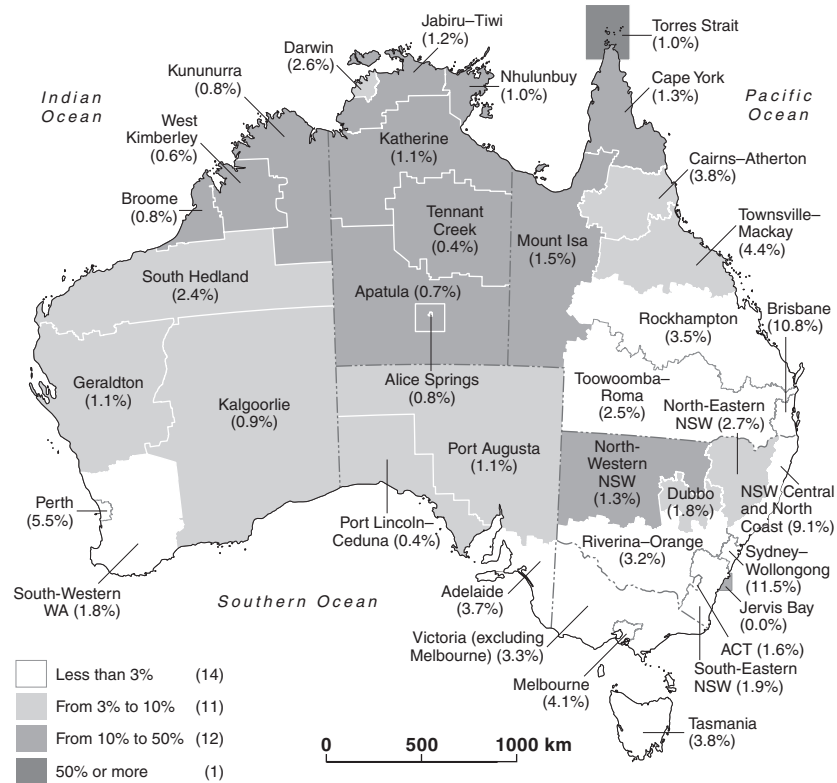
Variable	1971	1981	1991	2001	2011
Unemployment rate (% labour force)	5.63	4.24	2.70	2.78	3.17
Employment to population ratio (% adults)	0.73	0.61	0.66	0.71	0.71
Private-sector employment (% adults)	0.65	0.42	0.51	n/a	0.62
Labour-force participation rate (% adults)	0.78	0.77	0.84	0.82	0.81
Median weekly personal income (AUD 2011)	n/a	0.55	0.62	0.56	0.62
Never attended school (% adults)	37.83	15.29	5.10	3.20	2.00
Post-school qualification (% adults)	0.14	0.18	0.29	0.44	0.49
Degree or higher (% adults)	n/a	n/a	n/a	0.23	0.24
Attending educational institution (% 15–24-year-olds)	n/a	n/a	n/a	0.61	0.67
Male life expectancy at birth (years)	0.73	0.79	0.77	0.74	
Female life expectancy at birth (years)	0.67	0.82	0.80	0.77	
Population aged over 55 years (%)	0.43	0.34	0.32	0.31	0.37

Note: 'n/a' means that the data were not available in that year. Results have been rounded to two decimal places.

Sources: ABS Census of Population and Housing (1971), (1981), (1991), (2001) and (2011).

declined. Relative personal income has increased (since 1981) as has the relative share of the individuals who have attended school and who have post-school qualifications. Socioeconomically, in 2011 the Indigenous population looks a little more like the non-Indigenous population than it did in 1971.

The census also allows us to measure variations within the Indigenous population. In terms of economy, Map 24.2 replicates our population analysis from Map 24.1 by looking at the share of income going to the Indigenous population in the Indigenous region (the shadings) as well as the share of total Indigenous income received by usual residents of that region (the percentages). Doing so, we find a more exaggerated version of Map 24.1. The income received by Indigenous Australians makes up a greater share of the economy in remote regions compared to the share of those in more urban parts of the country. However, most of the income received by Indigenous Australians accrues to those in urban parts of the country. For example, the total income of Indigenous usual residents of Sydney (\$1.03 billion in 2011) was almost one and a half times as high as the total income of Indigenous usual residents of the Northern Territory (\$702 million).



Map 24.2 Percentage of Indigenous region income received by Indigenous population (shadings) and percentage of total income of Indigenous Australians (text), 2011

Source: Customised calculations using ABS Census of Population and Housing (2011).

The apparent decline in formal statistical socioeconomic outcomes with remoteness is not surprising and has been shown repeatedly in analyses of census data since 1971 (Biddle 2013c). The more Indigenous Australians live in geographic proximity to non-Indigenous Australians, the more similar their socioeconomic outcomes will be. This is the underlying logic behind the Closing the Gap framework that currently dominates Indigenous policy. However, this assumes that Indigenous Australians do not face significant barriers to entering mainstream labour markets and that they will migrate for employment if need be. Work by Biddle et al. (2013) shows that Indigenous Australians continue to report high levels of labour market discrimination. Furthermore, Biddle and Cameron (2012) show that Indigenous Australians continue to lag behind their non-Indigenous peers in mainstream skills development, with these differences starting early and widening across the life course. Biddle (2013c) has also shown that even in Australia's wealthiest urban centres there are suburbs and neighbourhoods where the socioeconomic outcomes of the Indigenous population are more similar to those of their remote counterparts than of their neighbours.

Reflecting this disadvantage, expenditure by all levels of government in Australia (combined) on services for Indigenous Australians is much higher per capita than it is for non-Indigenous Australians. Neutze, Sanders and Jones (1999, p. xi) stated the issue of expenditure as follows: 'Some have asserted that too much is being spent on Indigenous people in comparison with other needy sectors of the Australian community, while others have pointed to the very substantial disadvantages which Aboriginal and Torres Strait Islander people continue to face and the need for a special effort to help them overcome those disadvantages.' In order to add some data to that debate, they attempted to estimate relative expenditure on Indigenous people across four main areas of government policy: education, employment, health and housing. They found considerable variation, with higher expenditure across the first three areas but lower expenditure per Indigenous person on housing (when taxation advantages for owner-occupation and household size are taken into account).

More recently (in 2010 and 2012), the Productivity Commission produced an Indigenous Expenditure Report, which allocates all government expenditure to Indigenous and non-Indigenous Australians. Making use of a much greater range of data than those outside government would have access to, the enquiring Steering Committee estimated that for every \$1 spent on a non-Indigenous person by governments in Australia, \$2.25 is spent on an Indigenous person (SCRGSP 2012). This is due to (in the Committee's words) a 'greater intensity

of service use' as well as 'additional cost of providing services' (SCRGSP 2012, p. 2). It is not clear from the available data whether this additional expenditure is sufficient to counteract the current and historical levels of disadvantage and discriminatory government policy documented in this chapter. Furthermore, it would appear that a large proportion of the additional expenditure is negative expenditure (like crime and justice) that deals with disadvantage or even exacerbates it as opposed to positive expenditure that represents an investment in reducing disadvantage in the long term.

Not only does the Indigenous population lag behind the non-Indigenous population in terms of socioeconomic outcomes, but it also fares worse than other indigenous population subgroups in Canada, New Zealand and the United States. Cooke et al. (2007) calculated a HDI score for Indigenous Australians for 2000–01, and estimated a gap of 0.184 in favour of the non-Indigenous population. Indeed, the HDI score for Indigenous Australians would give the population a rank of 103, analogous to a medium human development country. This was not only lower than all other comparable Indigenous groups, but also the gap between the Indigenous and non-Indigenous population was much wider in Australia than the other three countries mentioned.

Equally as important as the socioeconomic variation of the Indigenous population within the various levels of the remoteness hierarchy is the way in which data from the census obscure broader notions of wellbeing. Economists have become increasingly comfortable using data on subjective wellbeing (Frey 2010) to capture a more holistic picture of an individual's lived experience. Although we don't have data on such measures historically, Biddle (2013a) has shown that Indigenous Australians in remote areas are significantly more likely to report that they were happy all or more of the time in the four weeks preceding their enumeration in the 2008 National Aboriginal and Torres Strait Islander Social Survey. Differences by remoteness are even greater when subjective Indigenous notions of wellbeing, such as participation in hunting, fishing and gathering (Altman, Biddle & Buchanan 2012), language maintenance (Biddle & Swee 2012; Dockery 2012) and other cultural activities are considered.

Spatial visibility: land rights and native title

We have witnessed one of the great transfers of land back to traditional owners in the past four decades – one that can be described as a 'land rights revolution'. Today, one-third of the Australian continent is under some form of Indigenous title (Altman & Jackson 2014).

By 1938 there was no legal recognition of Aboriginal land ownership, although some Crown land was reserved for exclusive Aboriginal use. The early seeds of a formal Aboriginal struggle for land justice were sown by Aboriginal leaders such as William Cooper, Jack Patten and William Ferguson on the Day of Mourning held on Australia Day in 1938. While their organisations, the Australian Aborigines League and the Aborigines Progressive Association, based in New South Wales and Victoria respectively, were social movements focused on full citizenship rights for Aboriginal Australians, land dispossession and restoration were also key concerns (Attwood & Markus 2004; Burgmann 2003).

Despite these protests, there was no political movement for land rights and Australia never developed a comprehensive land policy for Indigenous people. But the concurrence of a series of developments in the 1960s, including greater constitutional recognition, the bestowal of full citizenship rights, greater connectivity with global civil and human rights movements, enhanced Indigenous activism and the geopolitics of regional decolonisation, saw the emergence of land rights as a political issue of significance. The first major recognition of land rights by an Australian government occurred when the South Australian parliament enacted the *Aboriginals Lands Trust Act* in 1966 (Dunstan 1966).

Tracing how land rights and native title unfolded over the past 40 years is complex, so we focus here on the two key national events, 20 years apart, that have set the key benchmarks for legal repossession.

The first was the passage of the federal *Aboriginal Land Rights (Northern Territory) Act 1976*. In 1972 the reformist government of Gough Whitlam was elected with commitments to Indigenous self-determination and land rights. This commitment was partially born of a negative outcome in the celebrated Gove Land Rights Case in which Yolngu (Aboriginal) plaintiffs took the federal government and the mining company NABALCO to court for approving a massive bauxite mine, without any consultation, within the Arnhem Land Aboriginal Reserve in 1968 (this legal action followed an earlier political appeal to the federal parliament in 1963 contained in the Bark Petitions). In 1971, Justice Blackburn found against the plaintiffs and endorsed the notion of terra nullius by infamously espousing that Aboriginal people belonged to the land; the land did not belong to the people under their customary normative rules. Subsequently, the Yolngu and their supporters again sought political rather than legal recourse for their grievances; and the Gove Case became an important precursor both for legal land rights and later native title.

The Whitlam land rights law was passed by the subsequent Fraser government. It came about mainly for 'social justice' reasons, but it was limited

to the Northern Territory, then a federal jurisdiction in which the national government retained special constitutional powers. The law did three things. First, it created a special form of inalienable land that was held by land trusts on behalf of landowners and managed by statutory authorities called land councils. This particular form of fee simple title is called 'Aboriginal freehold'. Second, it vested all existing reserves in the Northern Territory with land trusts and created a mechanism whereby unalienated Crown land could be claimed before a judicial land commissioner if claimants could prove that they were a local descent group with primary spiritual responsibility for, and were entitled to forage over, the land claimed. Third, while traditional owners were not granted mineral rights that remained vested with the Crown, they were given a free, prior and informed consent right to veto mineral exploration on their ancestral lands. This right constituted a de facto property right over minerals.

Following this reform, all Australian states, except Western Australia, introduced forms of statutory land rights, with the South Australian *Pitjantjatjara Land Rights Act 1981* and *Maralinga Tjarutja Land Rights Act 1984* providing the most extensive regional settlements.

The second event was the epochal *Mabo* Judgment handed down by the High Court of Australia after a 10-year legal battle. In this action the late Eddie Mabo and others from the Torres Strait Islands argued that the precolonial land tenure system by which they lived remained intact and so could be recognised by Australia's common law. The High Court agreed, recognising that a form of native title had existed pre-colonially in the Torres Strait and that it could prevail at common law if not extinguished. This judgment rejected the legal fiction of terra nullius and raised important questions about land tenure, property rights and investment certainty in Australia.

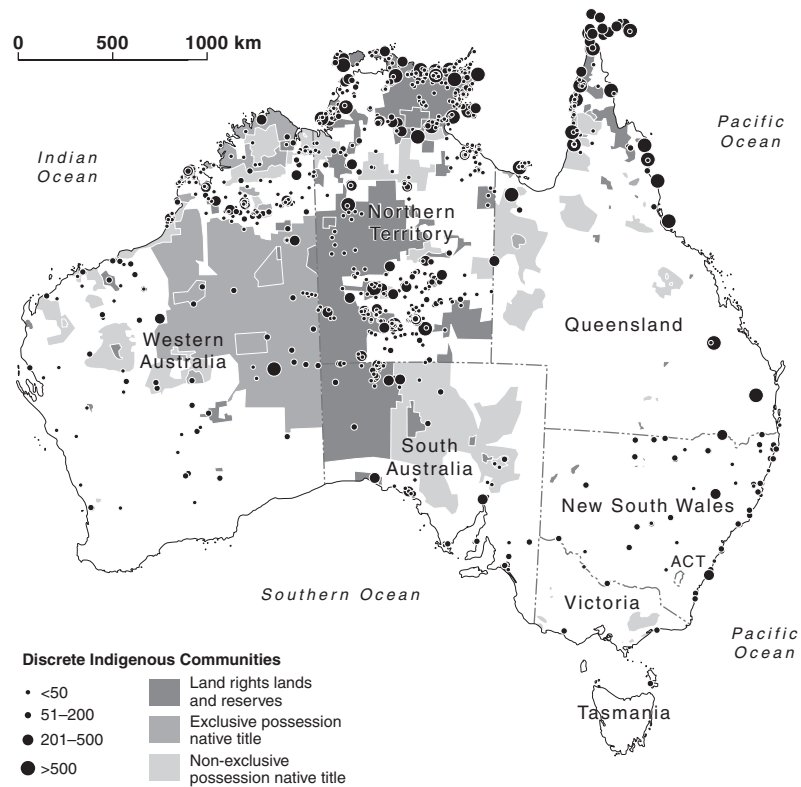
The resulting *Native Title Act 1993* was a law to deal with these uncertainties: it validated existing, mainly non-Indigenous, private interests in land held under freehold title, while providing a process for native title to be claimed and determined where it had not been extinguished. Those wishing to successfully claim native title had to prove continuity of customs and traditions and uninterrupted connection to the claimed lands and waters back to initial colonisation whenever this occurred after 1788 as settler colonialism spread across the continent.

There has been a complex development of native title jurisprudence since the passage of the *Native Title Act* that has been broadly labelled by the legal scholar Lisa Strelein (2009) as 'compromised jurisprudence'. As with real property held under land rights law (except in one jurisdiction, New South

Wales), land in respect of which native title is determined is held by collective corporate entities (Prescribed Bodies Corporate), is inalienable and can only be surrendered to the Crown. While the High Court ruled in 2002 that native title constitutes a bundle of rights that excludes sub-surface minerals, in other judgments it has confirmed that native title rights include customary (non-commercial) resource rights (the *Yanner* judgment, 1999; the *Karpany* judgment, 2013) and that they can include non-exclusive rights to trade marine species commercially (the *Akiba* judgment, 2013).

Native title can take various forms, including exclusive and non-exclusive (shared) possession, with the latter category being prevalent where there is another land interest, chiefly pastoral leasehold title. Under the *Native Title Act*, native title parties do not enjoy free, prior and informed consent rights over mineral exploration and extraction, but rather a time-limited right to negotiate, at best. Lacking the right to veto mining and only possessing procedural rights to compensation that are similar to those available to other Australians, native-title holders find that legal recognition of their native title includes few special rights. This is despite the requirement to demonstrate continuity of customs and traditions and the maintenance of connection with lands and waters since colonisation. To meet such requirements claimants must demonstrate a western legal notion of authenticity and the legal fiction of being uninvaded, a process that Wolfe (1999) refers to as ‘repressive authenticity’. Tania Murray Li (2010), examining the Asia and Pacific more generally, highlights the cruel irony that to have a land claim recognised as legitimate, colonised people are required to use an idiom of traditional custom despite new aspirations, new practices and new customs.

Demonstrating the extent of Indigenous land holdings is difficult because of the diversity of land tenures and the current dynamism of the claims process. In Map 24.3 we show Indigenous land holdings as we are best able to currently determine. In this map we distinguish three forms of land tenure: land claimed or scheduled under a series of federal and state land rights laws or acquired with federal funding by institutions such as the Aboriginal Land Fund Commission, the Aboriginal Development Commission and most recently Indigenous Business Australia and the Indigenous Land Corporation; native title lands in respect of which there have been determinations of exclusive possession as at August 2013; and native title lands in respect of which there have been determinations of non-exclusive possession. To summarise this map briefly, our current best estimates are that land rights laws and acquisitions have returned more than 969 000 km² to Indigenous traditional owners; 92 determinations of exclusive possession



Map 24.3 Indigenous-owned lands and discrete Indigenous communities, 2013

cover a total of more than 752 000 km²; and 142 determinations of non-exclusive possession (which provide highly variable rights shared with other interests, often commercial pastoralism) cover 825 000 km². While there is some overlap between these categories, these have been removed for accounting purposes in the estimated land areas presented in the map, giving a total area of land acquired through land rights or any form of native title of 2.5 million km², or 33 per cent of Australia's landmass. What we do not include in this map are Indigenous land interests under 802 voluntary Indigenous Land Use Agreements that are made between native title groups and others about the use of an area of land, covering 1.8 million km²; and 321 registered native title claims that cover just over 3.2 million km² (with much overlap with the land covered by the Agreements). Registered claims are economically important because under native title law they allow claimants a right to negotiate over developments, even though a determination may be pending.

We also show in the map the geographic distribution of 1200 discrete Indigenous communities, most of which are located on Indigenous-owned land. The larger of these communities were historically government settlements and missions; the smaller communities, called homelands or outstations, of which there are about 1000, are residential offshoots from these larger colonial places. There is an uncanny resemblance in size between these 21st-century communities in remote Australia and the estimated size of precolonial residence groups (Keen 2004). The small and dispersed nature of these communities clearly presents a service delivery challenge for all levels of government and also influences the form of economy likely in such small, remote places.

The mix of land tenure and population is shown a little differently in Table 24.4, using the latest available land tenure information and data on estimated resident population from the 2011 Census. This table shows that there are really two broad categories of place: jurisdictions where there are land rights and native title exclusive possession and an Indigenous share of the population of more than 80 per cent; and other jurisdictions, including where there are non-exclusive determinations and registered claims, and a much lower Indigenous share of the population. In aggregate it is possible that some form of land rights or native title might be recognised in more than 70 per cent of Australia, where more than 40 per cent of the Indigenous population currently resides. Note that the population figures refer to residents, not owners of various jurisdictions. This is an extraordinary turnaround from the mid-1960s when there was no recognition of land rights under Australian law.

The rapid legal repossession of a significant area of 1.7 million km² of land held under exclusive possession and inhabited by less than 100 000 Indigenous

Table 24.4 Indigenous lands and populations in Australia, 2013

Tenure	Area (‘000 km ²)	Percentage of Australian landmass	Indigenous population (‘000)	Percentage of residents Indigenous	Percentage of Australia’s Indigenous population
Land rights or Indigenous reserve	969	12.6	59	81	9
Exclusive possession native title	752	9.8	11	82	2
Non-exclusive possession native title	825	10.7	3	18	0
Registered claims ^a	3014	39.2	226	3	34
Indigenous Land Use Agreements ^b	1840	23.9	70	3	11

Notes: ^a excludes areas of registered claims over land rights lands or Indigenous reserves.

^b includes agreements over land rights lands, Indigenous reserves, determined native title and claimed native title.

Those in offshore, migratory, shipping or no usual address SAIs are excluded from population estimates.

Areal measures of regions only count land in order to facilitate comparisons with Australia as a whole. Therefore, Indigenous sea interests are not considered.

Estimated resident populations are pro-rated at Mesh Block level from state, sex, age and Indigenous status matrices.

Source: Data provided by Jon Altman and Francis Markham, Australian National University (original data collection and GIS mapping).

people presents a multiplicity of economic development challenges. Almost all Indigenous-owned land is in very remote Australia and so is distant from centres of commercial activity and has poor market linkage. Indeed, the very reason that so much of this land was unalienated in the 19th and 20th centuries and sparsely populated and is now available for claim is that it had no or low ‘old economy’ commercial value, especially when compared with land in the more temperate south-east and south-west of the continent. For example, grazing on unmodified pastures is the only extensive commercial land use of Indigenous lands of exclusive possession but coverage is currently limited to less than 10 per cent.

Paradoxically, in recent years two other forms of contrasting value have become associated with Indigenous-owned land. First, mineral mapping indicates that some Indigenous-owned areas might be highly prospective. Second, because of a historic absence of intensive agriculture or grazing, many Indigenous-owned lands have experienced relatively little environmental disturbance and hence retain high biodiversity and associated conservation values. A fundamental tension remains between the requirements for gaining land rights and native title (proof of continuity of customs and traditions observed and physical connection to the land); and the subsequent broader expectation that Indigenous landowners will quickly flourish according to western criteria and integrate into mainstream economy and society and adopt western norms. But such convergence will almost inevitably require cultural and physical migrations that will disconnect Indigenous landowners from their country, a prospect that is anathema for many native title groups after years of legal contestation. The possibility of such incommensurability raises serious questions about how the transformative potentiality embodied in the rapid land titling of the past 40 years can be harnessed for diverse and relatively autonomous economic futures for that small proportion of Indigenous population made up of owners and residents of Indigenous lands.

Policy approaches, future prospects

This chapter spans a period of more than 160 years and makes a heuristic distinction between two periods: 1850–1970, when the economic histories of Indigenous Australians were largely invisible; and 1970 to the present, when the socioeconomic situation of Indigenous people became more statistically visible and the extent of their landholdings, mainly limited to remote Australia, grew exponentially. During the first period, colonial and later state and territory policies set Indigenous people aside from other citizens for their ‘protection and preservation’, often incarcerating them on reserves and missions. This approach can be interpreted positively as a means of preparing Aboriginal people for future full citizenship; or negatively as ‘smooth[ing] the pillow for a dying race’ (Bates 1938).

When, from the 1930s onwards, it became apparent that the Indigenous population was neither declining nor disappearing, policy shifted initially to assimilation and then integration (Altman & Sanders 1991). Both approaches were based on a clear assumption that Indigenous people would adopt the lifestyles, beliefs and values of the settler majority. From the 1970s onwards this assumption was increasingly incorporated in the notion of convergence;

that with time quality of life measured by statistical indicators would show a reduction in disparities between Indigenous and other Australians. The most recent manifestation of this approach was articulated by Kevin Rudd (2008), then Prime Minister in the National Apology to the Stolen Generations: he emphasised the need to build a bridge based on a partnership between Indigenous and non-Indigenous Australians, to close the gap in life expectancy, educational achievement and employment opportunities.

The overarching goal of eliminating disparity is admirable in one of the world's richest countries, but what it means in policy specifics is difficult to assess. The problem is linked in part to the obligations of a rich, late liberal democratic state to its Indigenous subjects both as citizens and as First Peoples, the latter a notion that has gained traction since Australia endorsed the United Nations Declaration on the Rights of Indigenous Peoples in 2009. As citizens, Indigenous people should be able to access services on an equitable needs basis as the rest of the community. Reflecting their status as special citizens, there has been a growing array of programs, new institutions and laws over the past four decades that are Indigenous-specific. Many of these had their genesis during a period that now seems like an interlude (1972–75) when the notion of self-determination was dominant.

A variety of binary frames have been used to explain the recent history of Indigenous policy. Altman and Rowse (2005) distinguish approaches that focus on equality, with socioeconomic differences seen as deficits to be reduced or eliminated; and approaches that concentrate on equity and choice to live differently. Austin-Broos (2011) differentiates between separatist approaches that favour Indigenous-specific programs and those that are anti-separatist and favour undifferentiated mainstreaming. Rowse (2012) distinguishes two broad approaches: one that focuses on 'populations' and uses statistics to assess relative socioeconomic status; the other that emphasises 'peoples' and gives priority to issues of Indigenous rights and social justice. Other commentators look beyond such binaries. For example, Noel Pearson (2009) has sought to find a 'radical centre' where Indigenous people can simultaneously engage with the real economy while morally restructuring problematic aspects of their cultural lives and retaining their distinctiveness. Altman (2013) focuses on interculturality, a blending of western and Indigenous norms and associated hybrid forms of economy.

The currently dominant project to 'close the gap' according to the normative criteria of mainstream society can be assessed using census data and social indicators. Our analysis above shows that disparities are declining in some areas, but projections based on past policy performance indicate that elimination will take generations (Altman, Biddle & Hunter 2009). Proper

policy settings, enhanced societal tolerance, and appropriate investments – based on objective assessments of need – will be key factors in reducing disparity, born in part from dispossession and historical trauma, but also from social exclusion and past neglect. The question of appropriate quantum is especially pertinent; in a recent report the Productivity Commission (2012, p. 2) estimated such expenditures in mainstream and Indigenous-specific programs totalled \$25.4 billion in 2010–11, 5.6 per cent of total direct government expenditure. But the report was unable to ascertain whether this is an adequate expenditure; what proportion was positive (for example, in education where Indigenous people are under-represented) versus negative (incarceration where Indigenous people are severely over-represented); and what portion of expenditure was reaching those in most need.

Looking to the future, one might envision two broad possibilities: sub-national and national. In regional and remote Australia, where Indigenous people now own land under western law, one might see the leveraging of diverse property rights and the legal guarantee of access to natural resources for non-commercial purposes as the basis for diverse and distinct forms of hybrid economies. This concept (Altman 2013, pp. 128–9) depicts customary, state and market sectors delivering livelihoods – it acknowledges the mix of capitalist and non-capitalist relations of production, and of common and private forms of property in many contemporary Indigenous economies. The model, represented in Altman (2013) as a venn diagram with three overlapping circles, theorises that most productive activity occurs in the spaces of inter-linkage. This is the same model of economic hybridity, as we noted earlier, that is being used by some to reconceptualise Indigenous economic histories, except that today the state sector is far more significant than in the past in providing transfer payments as well as wages and salaries for public sector work.

Such production models see some Indigenous people engaging directly with mineral extraction through employment and enterprise, while others engage with expanding conservation and consumption opportunities, including in ‘Caring for Country’ initiatives and cultural tourism. Some Indigenous people will utilise their customary resource rights guaranteed by native title law in the harvesting of wildlife for domestic use; others will utilise customary expertise in arts and other cultural industries for domestic and global market exchange. The growing recognition of the conservation value of Indigenous lands has seen the emergence of a strong Caring for Country movement supported by environmental agencies and Indigenous landowners. Historically, much conservation work has been undertaken informally, but in 1996 the federal government established the Indigenous Protected

Areas program that allows the formal incorporation of Indigenous land with high environmental values into the National Reserve System, the conservation estate. In 2007, this was followed by the establishment of the Working on Country program that pays Indigenous rangers to deliver environmental services alongside contracted work.

The concept of economic hybridity makes sense of the fact that those Indigenous people who have new-found rights in land can make a livelihood both flexibly and diversely depending on opportunities and aspirations. There is a possibility that in the future those who have successfully claimed back their Indigenous lands will be well positioned to combine new and old production regimes to enhance their wellbeing, while simultaneously making significant contributions to the nation's economic future. Such hybrid forms of development might improve wellbeing and accord with diverse Indigenous aspirations, but they may not close statistical gaps.

At the national level, one might see an Indigenous component of the economy that grows over time, with regional variations and many overlaps between landed and landless or remote and densely settled regions. We estimate that the Indigenous share of the national economy is currently 1.3 per cent; if it were to eventually match the current Indigenous share of the total population it would need to expand to about 3 per cent. The pace of such convergence is difficult to gauge. Some commentators, such as Marcia Langton (2013), talk of a 'quiet revolution' and the rapid emergence of an Indigenous middle class – and there is no question that Indigenous people make significant contributions to Australian economy, society and cultural life in numerous sectors. Others argue that there might be fundamental enduring tensions between Indigenous and non-Indigenous life-worlds that make convergence difficult. As W. E. H. Stanner (2009, p. 163) observed: 'Ours is a market-civilisation, theirs not. Indeed, there is a sense in which The Dreaming and The Market are mutually exclusive.' Finally, there is a possibility that the pace of convergence is too slow and that this is generating unacceptable costs both for Indigenous and non-Indigenous Australians.

Which of these various scenarios emerges is difficult to predict; there is too much uncertainty about the future direction of capitalism and globalisation. What is clear, though, is that the demographic survival of Indigenous people is more certain today than at any other time since 1788. And economic possibilities exist today that were unimaginable as recently as when Stanner made his perceptive observation. Such possibilities might just result in situations where the Dreaming and the market are in fact compatible and productive rather than mutually exclusive.

Statistical Appendix: selected data series, 1800–2010

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Real economy

Table A1 GDP and sectoral shares, 1801–2010

Year	Real GDP (\$ million)	Sectoral shares of GDP/GNP (current prices) (%)			
		Agriculture	Mining	Manufacturing	Other
1801	35	30	0	3	67
1802	38	46	0	1	53
1803	39	44	0	7	49
1804	43	37	0	2	61
1805	48	47	0	2	52
1806	52	46	0	0	54
1807	57	49	0	3	49
1808	58	45	0	2	53
1809	60	47	0	2	51
1810	75	61	0	5	34
1811	85	58	0	2	40
1812	83	56	0	2	42
1813	86	55	0	2	43

Table A1 (*cont.*)

Year	Real GDP (\$ million)	Sectoral shares of GDP/GNP (current prices) (%)			
		Agriculture	Mining	Manufacturing	Other
1814	90	52	0	4	44
1815	101	56	0	4	40
1816	108	48	0	6	46
1817	110	49	0	4	47
1818	125	51	0	5	44
1819	140	54	0	3	44
1820	152	54	0	3	43
1821	179	56	0	4	40
1822	211	55	0	5	41
1823	215	52	0	5	43
1824	220	50	0	5	45
1825	242	49	0	5	46
1826	256	49	0	5	46
1827	273	45	0	5	50
1828	301	47	0	4	49
1829	336	44	0	5	51
1830	433	43	0	7	50
1831	529	42	0	6	52
1832	566	40	0	7	53
1833	602	42	0	8	50
1834	652	50	0	7	43
1835	794	57	0	6	37
1836	912	55	0	5	40
1837	957	48	0	6	46
1838	1,017	43	0	8	49
1839	1,020	43	0	9	48
1840	1,203	43	0	12	44
1841	1,332	43	0	8	49
1842	1,220	38	0	8	53
1843	1,312	36	0	6	57
1844	1,580	34	0	7	59
1845	1,773	35	0	7	58
1846	1,964	36	2	7	56
1847	2,331	36	2	9	53
1848	2,818	35	3	10	53
1849	3,168	33	2	10	55
1850	3,249	35	3	10	52
1851	3,662	33	5	11	51
1852	4,762	16	36	7	41
1853	6,073	16	28	9	48
1854	6,634	17	19	10	54
1855	6,732	23	22	8	47

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1856	8,059	22	23	8	46
1857	9,012	24	22	12	42
1858	8,413	25	20	12	43
1859	9,398	25	18	12	46
1860	10,852	24	17	13	47
1861	10,989	20	15	5	60
1862	10,946	22	16	5	58
1863	11,028	22	14	5	59
1864	11,808	25	14	5	57
1865	12,372	24	12	5	59
1866	12,751	25	11	7	56
1867	13,931	28	11	7	54
1868	15,080	23	12	8	57
1869	15,511	25	11	8	57
1870	16,147	27	9	9	56
1871	16,403	24	12	9	55
1872	16,968	27	10	9	55
1873	18,773	28	8	9	55
1874	20,025	28	8	9	55
1875	21,461	29	8	9	54
1876	22,538	27	7	10	56
1877	22,959	24	6	11	60
1878	24,549	28	6	10	56
1879	25,872	27	5	10	57
1880	26,734	28	5	10	57
1881	28,396	25	5	11	60
1882	28,590	24	5	11	59
1883	29,821	25	4	11	59
1884	31,945	21	4	12	63
1885	33,084	22	4	12	62
1886	34,325	21	4	11	64
1887	36,346	23	4	11	62
1888	38,336	26	4	11	59
1889	40,142	23	5	10	62
1890	41,055	23	5	11	62
1891	41,865	25	5	10	60
1892	40,726	23	6	11	59
1893	37,023	25	7	11	57
1894	36,633	24	8	11	57
1895	36,202	28	8	13	52
1896	36,469	23	7	13	58
1897	36,787	22	9	13	56
1898	38,521	20	8	12	60
1899	41,290	20	11	13	56
1900	42,604	21	11	13	56
1901	41,889	19	10	12	58
1902	46,132	19	9	12	61

Table A1 (*cont.*)

Year	Real GDP (\$ million)	Sectoral shares of GDP/GNP (current prices) (%)			
		Agriculture	Mining	Manufacturing	Other
1903	43,113	20	10	11	59
1904	48,047	29	9	10	51
1905	47,235	28	10	11	51
1906	49,376	28	9	11	51
1907	56,331	30	9	12	49
1908	52,023	28	8	12	52
1909	54,044	27	7	13	53
1910	57,143	30	6	12	52
1911	62,302	27	6	13	54
1912	61,385	23	6	14	56
1913	64,145	23	6	14	57
1914	67,174	24	5	13	58
1915	63,808	18	5	15	62
1916	64,764	25	5	14	56
1917	62,920	31	5	12	53
1918	62,354	31	4	12	52
1919	63,445	28	4	12	57
1920	65,909	24	3	11	62
1921	68,965	28	2	12	57
1922	72,695	23	2	14	60
1923	76,398	23	2	14	61
1924	79,844	23	3	15	60
1925	86,671	26	2	13	58
1926	87,654	23	2	15	61
1927	90,845	21	3	15	61
1928	90,360	20	2	16	61
1929	91,182	21	2	17	60
1930	86,631	20	2	18	60
1931	74,257	21	2	16	62
1932	75,846	23	2	16	59
1933	82,753	23	2	16	58
1934	86,859	26	2	16	56
1935	91,734	22	3	16	59
1936	97,362	24	3	16	57
1937	100,270	25	3	16	56
1938	107,352	23	3	17	57
1939	107,312	20	3	19	58
1940	109,386				
1941	117,585				
1942	134,826				
1943	146,573				

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1944	144,828				
1945	136,457				
1946	130,820				
1947	126,857				
1948	137,116				
1949	143,883	21	2	26	50
1950	155,559	24	2	25	48
1951	164,530	29	2	24	45
1952	169,352	19	2	27	51
1953	168,036	21	2	26	51
1954	178,610	19	2	27	52
1955	189,255	16	2	28	53
1956	198,770	16	2	28	54
1957	202,676	17	2	28	54
1958	206,997	13	2	29	56
1959	222,364	14	2	29	55
1960	235,783	13	2	29	56
1961	241,642	13	2	29	57
1962	244,978	12	2	28	58
1963	260,355	11	2	26	61
1964	278,641	12	2	25	61
1965	295,319	11	2	26	61
1966	302,213	9	2	26	63
1967	321,305	10	2	25	63
1968	337,782	8	2	25	65
1969	361,637	9	2	25	65
1970	387,656	7	3	25	65
1971	403,159	6	3	24	67
1972	418,874	6	3	24	67
1973	429,977	7	3	23	67
1974	447,672	8	3	22	67
1975	453,204	6	4	21	69
1976	465,110	5	4	21	70
1977	481,732	5	5	20	70
1978	486,005	4	5	20	71
1979	506,087	6	5	19	69
1980	521,559	6	6	19	69
1981	539,299	5	6	19	69
1982	556,761	5	6	19	70
1983	543,876	4	6	18	72
1984	569,689	5	7	18	71
1985	598,543	4	7	17	71
1986	625,997	4	6	17	73
1987	642,470	4	5	16	75
1988	678,762	4	5	16	75
1989	705,368	4	4	15	76
1990	730,662	4	4	15	76

Table A1 (*cont.*)

Year	Real GDP (\$ million)	Sectoral shares of GDP/GNP (current prices) (%)			
		Agriculture	Mining	Manufacturing	Other
1991	728,098	4	5	14	77
1992	731,216	3	5	14	77
1993	761,274	4	5	14	77
1994	792,096	4	5	15	77
1995	823,697	3	5	15	77
1996	856,592	4	5	14	77
1997	890,004	4	5	14	78
1998	930,268	3	5	14	78
1999	976,358	3	5	13	79
2000	1,013,910	3	5	13	79
2001	1,033,167	4	6	12	78
2002	1,073,597	4	5	12	79
2003	1,107,426	3	5	12	79
2004	1,153,355	3	5	12	80
2005	1,190,111	3	6	12	80
2006	1,226,323	3	7	11	79
2007	1,272,776	2	8	11	79
2008	1,320,746	3	8	10	80
2009	1,342,514	3	10	9	78
2010	1,370,540	2	8	9	81

Sources:

Real GDP

1959–60 to 2011–12 ABS (2011–12a)

1939–40 to 1958–59 M. W. Butlin (1977, Table IV.3, p. 85)

1911–12 to 1938–39 Haig (2001, pp. 1–3)

1900–01 to 1910–11 M. W. Butlin (1977, Table IV.3, p. 84)

1861–1901 Butlin (1985a, p. 1f)

1828–1860 Butlin (1986, pp. 96–125)

1800–1828 Snooks (1994, Table 7.9, p. 180)

All data is for financial years ending in the year indicated and is in constant 2010–11 prices.

Sectoral shares

1788–1860 Vamplew (1987, Table ANA 38–46, p. 131)

1861 to 1938–39 Vamplew (1987, p. 133)

1939–40 to 1947–48 No data

1948–49 ABS, cat. no. 5204.0 (various dates)

Calendar years to 1900; financial years after 1900.

Until 1861, agriculture includes pastoral and non-pastoral primary production.

Manufacturing includes private construction.

For 1861 onwards, agriculture is pastoral, agriculture and dairying, and forestry fishery.

Population

Table A2 Population, migration, labour force and unemployment, 1800–2010

Year	Population				Labour force				
	Males	Females	Persons	Sex ratio	Net migration share of population increase (%)	Proportion of population born overseas (%)	Labour force ('000 persons)	Unemployment rate (%)	Participation rate (%)
1800	3,780	1,437	5,217	263.0					
1801	4,372	1,573	5,945	277.9					
1802	5,208	1,806	7,014	288.4					
1803	5,185	2,053	7,238	252.6					
1804	5,313	2,285	7,598	232.5					
1805	5,395	2,312	7,707	233.3					
1806	5,389	2,521	7,910	213.8					
1807	5,939	2,855	8,794	208.0					
1808	6,822	3,441	10,263	198.3					
1809	7,618	3,942	11,560	193.3					
1810	7,585	3,981	11,566	190.5					
1811	7,697	4,178	11,875	184.2					
1812	8,132	4,498	12,630	180.8					
1813	9,102	4,855	13,957	187.5					
1814	9,295	4,791	14,086	194.0					
1815	9,848	5,215	15,063	188.8					
1816	11,690	5,863	17,553	199.4					
1817	14,178	7,014	21,192	202.1					
1818	17,286	8,573	25,859	201.6					
1819	21,366	10,106	31,472	211.4					
1820	23,784	9,759	33,543	243.7					

Table A2 (cont.)

Year	Population					Labour force			
	Males	Females	Persons	Sex ratio	Net migration share of population increase (%)	Proportion of population born overseas (%)	Labour force ('000 persons)	Unemployment rate (%)	Participation rate (%)
1821	26,179	9,313	35,492	281.1					
1822	27,915	9,449	37,364	295.4					
1823	30,206	10,426	40,632	289.7					
1824	36,871	11,201	48,072	329.2					
1825	40,288	12,217	52,505	329.8					
1826	41,289	12,593	53,882	327.9					
1827	43,053	13,247	56,300	325.0					
1828	44,778	13,419	58,197	333.7					
1829	46,946	14,988	61,934	313.2					
1830	52,885	17,154	70,039	308.3					
1831	57,037	18,944	75,981	301.1					
1832	62,254	21,683	83,937	287.1					
1833	71,669	26,426	98,095	271.2					
1834	76,259	29,297	105,556	260.3					
1835	81,929	31,425	113,354	260.7					
1836	89,417	35,703	125,120	250.4					
1837	94,881	39,607	134,488	239.6	94.8				
1838	105,271	46,597	151,868	225.9	94.6				
1839	115,480	54,459	169,939	212.0	96.6				
1840	127,306	63,102	190,408	201.7	90.6				
1841	144,114	76,854	220,968	187.5	92.2		110.2		49.9
1842	153,758	87,226	240,984	176.3	81.1				
1843	158,846	92,002	250,848	172.7	61.1				

1844	165,034	99,253	264,287	166.3	64.5			
1845	173,159	105,989	279,148	163.4	52.5			
1846	181,342	111,907	293,249	162.0	55.1	147.1		50.2
1847	190,265	118,532	308,797	160.5	60.0			
1848	201,612	130,716	332,328	154.2	76.5			
1849	221,978	151,384	373,362	146.6	87.4			
1850	238,683	166,673	405,356	143.2	79.6			
1851	256,975	180,690	437,665	142.2	64.3	196.7		44.9
1852	304,126	209,670	513,796	145.0	94.3			
1853	358,203	242,789	600,992	147.5	95.6			
1854	414,337	280,580	694,917	147.7	92.7	322.4		46.4
1855	470,118	323,142	793,260	145.5	87.8			
1856	522,144	354,585	876,729	147.3	79.8	397.5		45.3
1857	574,800	395,487	970,287	145.3	84.4			
1858	624,380	426,448	1,050,828	146.4	84.7			
1859	644,376	452,929	1,097,305	142.3	77.7			
1860	668,560	477,025	1,145,585	140.2	71.3			
1861	669,373	498,776	1,168,149	134.2	-26.0	62.8	547.8	5.2
1862	683,650	523,268	1,206,918	130.7	21.4			3.0
1863	704,259	555,033	1,259,292	126.9	42.6			2.7
1864	740,433	584,750	1,325,183	126.6	47.9			3.3
1865	773,278	616,765	1,390,043	125.4	46.7			3.5
1866	800,648	643,307	1,443,955	124.5	44.4			4.4
1867	819,127	664,721	1,483,848	123.2	18.9			6.3
1868	849,272	690,280	1,539,552	123.0	32.2			6.8
1869	875,139	717,018	1,592,157	122.1	28.6			6.1
1870	902,494	745,262	1,647,756	121.1	28.6			7.3
1871	928,918	771,970	1,700,888	120.3	22.0	46.5	674.4	9.0
1872	947,422	795,425	1,742,847	119.1	7.2			6.9
1873	972,907	821,613	1,794,520	118.4	22.0			3.9
1874	1,001,096	848,296	1,849,392	118.0	31.2			3.4
1875	1,028,489	869,734	1,898,223	118.3	37.8			4.5

Table A2 (cont.)

Year	Population					Labour force			
	Males	Females	Persons	Sex ratio	Net migration share of population increase (%)	Proportion of population born overseas (%)	Labour force ('000 persons)	Unemployment rate (%)	Participation rate (%)
1876	1,061,477	897,202	1,958,679	118.3	41.5			5.9	
1877	1,102,340	928,790	2,031,130	118.7	47.5			6.4	
1878	1,132,573	959,591	2,092,164	118.0	35.4			5.0	
1879	1,168,781	993,562	2,162,343	117.6	36.1			5.7	
1880	1,204,514	1,027,017	2,231,531	117.3	34.4			6.5	
1881	1,247,059	1,059,677	2,306,736	117.7	37.9	36.8	917.9	4.6	39.8
1882	1,289,892	1,098,190	2,388,082	117.5	46.5			1.9	
1883	1,357,423	1,148,313	2,505,736	118.2	59.4			2.5	
1884	1,411,996	1,193,729	2,605,725	118.3	51.1			4.2	
1885	1,460,394	1,234,124	2,694,518	118.3	41.4			4.8	
1886	1,510,954	1,277,096	2,788,050	118.3	41.4			4.5	
1887	1,559,118	1,322,244	2,881,362	117.9	36.2			6.3	
1888	1,610,548	1,371,129	2,981,677	117.5	38.8			5.4	
1889	1,649,094	1,413,383	3,062,477	116.7	28.0			4.3	
1890	1,692,831	1,458,524	3,151,355	116.1	27.7			3.9	
1891	1,736,617	1,504,368	3,240,985	115.4	30.0	31.8	1,310.5	5.7	40.4
1892	1,766,772	1,538,981	3,305,753	114.8	-4.8			11.1	
1893	1,791,815	1,570,080	3,361,895	114.1	-13.1			16.5	
1894	1,824,217	1,602,543	3,426,760	113.8	4.9			18.7	
1895	1,855,539	1,636,082	3,491,621	113.4	4.4			17.4	
1896	1,887,174	1,665,924	3,553,098	113.3	10.6			12.9	
1897	1,917,460	1,700,323	3,617,783	112.8	10.8			8.4	
1898	1,937,629	1,727,086	3,664,715	112.2	-1.1			8.6	

1899	1,959,074	1,756,914	3,715,988	III.5	-3.4			7.9	
1900	1,976,992	1,788,347	3,765,339	II0.5	-17.9			4.8	
1901	2,004,836	1,820,077	3,824,913	II0.2	6.1	22.8	1,611.0	3.9	42.1
1902	2,028,008	1,847,310	3,875,318	IO9.8	-10.0		1,649.8	4.8	42.6
1903	2,045,144	1,871,448	3,916,592	IO9.3	-25.0		1,688.6	8.5	43.1
1904	2,072,783	1,901,367	3,974,150	IO9.0	-2.1		1,748.5	9.4	44.0
1905	2,100,118	1,932,859	4,032,977	IO8.7	-2.1		1,730.7	8.6	42.9
1906	2,126,730	1,964,755	4,091,485	IO8.2	-6.5		1,729.1	6.6	42.3
1907	2,160,213	2,001,509	4,161,722	IO7.9	7.4		1,765.4	5.2	42.4
1908	2,193,981	2,038,297	4,232,278	IO7.6	9.3		1,784.0	3.4	42.2
1909	2,242,215	2,081,745	4,323,960	IO7.7	18.0		1,823.7	3.3	42.2
1910	2,296,308	2,128,775	4,425,083	IO7.9	28.6		1,885.9	3.3	42.6
1911	2,382,232	2,191,554	4,573,786	IO8.7	49.5	17.1	1,894.0	2.9	41.4
1912	2,478,230	2,268,359	4,746,589	IO9.3	52.7		1,997.6	2.4	42.1
1913	2,554,931	2,338,810	4,893,741	IO9.2	48.1		2,087.2	5.0	42.7
1914	2,577,576	2,394,202	4,971,778	IO7.7	20.6		2,133.0	3.3	42.9
1915	2,528,076	2,441,381	4,969,457	IO3.6	-15.9		2,150.7	5.9	43.3
1916	2,437,345	2,480,604	4,917,949	98.3	-35.3		2,163.8	3.5	44.0
1917	2,458,935	2,523,128	4,982,063	97.5	-2.0		2,215.1	3.3	44.5
1918	2,516,527	2,564,385	5,080,912	98.1	20.7		2,215.1	3.4	43.6
1919	2,698,378	2,605,196	5,303,574	IO3.6	8.1		2,189.0	3.6	41.3
1920	2,751,730	2,659,567	5,411,297	IO3.5	24.6		2,135.8	3.4	39.5
1921	2,799,415	2,711,529	5,510,944	IO3.2	20.5	15.5	2,203.0	5.8	40.0
1922	2,867,825	2,769,461	5,637,286	IO3.6	31.3		2,277.1	6.1	40.4
1923	2,932,310	2,823,676	5,755,986	IO3.8	33.8		2,334.2	5.0	40.6
1924	2,999,567	2,882,435	5,882,002	IO4.1	34.8		2,369.9	4.7	40.3
1925	3,063,761	2,939,266	6,003,027	IO4.2	33.3		2,476.7	6.3	41.3
1926	3,126,802	2,997,218	6,124,020	IO4.3	36.5		2,480.5	4.9	40.5
1927	3,194,858	3,056,158	6,251,016	IO4.5	40.6		2,524.5	4.2	40.4
1928	3,247,417	3,108,353	6,355,770	IO4.5	26.0		2,570.5	6.2	40.4
1929	3,284,095	3,152,118	6,436,213	IO4.2	15.4		2,576.1	6.7	40.0

Table A2 (cont.)

Year	Population					Labour force			
	Males	Females	Persons	Sex ratio	Net migration share of population increase (%)	Proportion of population born overseas (%)	Labour force ('000 persons)	Unemployment rate (%)	Participation rate (%)
1930	3,311,722	3,189,029	6,500,751	103.8	-9.4		2,565.8	9.8	39.5
1931	3,332,577	3,220,029	6,552,606	103.5	-20.0		2,564.8	16.4	39.1
1932	3,355,465	3,248,320	6,603,785	103.3	-4.2		2,564.8	19.7	38.8
1933	3,379,049	3,277,646	6,656,695	103.1	3.8	13.6	2,727.0	18.9	41.0
1934	3,401,865	3,305,382	6,707,247	102.9	8.3		2,758.3	16.0	41.1
1935	3,423,038	3,332,624	6,755,662	102.7	4.3		2,814.0	14.0	41.7
1936	3,448,026	3,362,387	6,810,413	102.5	7.7		2,817.9	11.0	41.4
1937	3,476,286	3,395,206	6,871,492	102.4	10.7		2,818.9	8.8	41.0
1938	3,507,543	3,428,366	6,935,909	102.3	17.2		2,874.5	7.5	41.4
1939	3,538,660	3,466,252	7,004,912	102.1	22.6		2,944.9	8.8	42.0
1940	3,570,508	3,507,078	7,077,586	101.8	23.5		2,992.8	9.0	42.3
1941	3,598,644	3,544,954	7,143,598	101.5	12.5		3,015.3	4.9	42.2
1942	3,619,699	3,581,397	7,201,096	101.1	10.0		3,136.4	1.9	43.6
1943	3,648,159	3,621,499	7,269,658	100.7	6.1		3,284.0	1.0	45.2
1944	3,682,795	3,664,229	7,347,024	100.5	0.0		3,337.7	1.0	45.4
1945	3,721,866	3,708,331	7,430,197	100.4	0.0		3,329.9	1.2	44.8
1946	3,766,689	3,751,292	7,517,981	100.4	-13.5		3,233.2	2.2	43.0
1947	3,828,462	3,809,501	7,637,963	100.5	8.3	9.8	3,197.0	2.9	41.9
1948	3,908,586	3,883,879	7,792,465	100.6	32.8		3,263.0	2.0	41.9
1949	4,047,252	3,998,318	8,045,570	101.2	57.6		3,352.5	1.5	41.7
1950	4,191,445	4,116,036	8,307,481	101.8	56.5		3,455.9	1.8	41.6
1951	4,310,933	4,216,974	8,527,907	102.2	50.6		3,572.1	1.1	41.9
1952	4,425,528	4,314,041	8,739,569	102.6	43.4		3,665.6	1.4	41.9

1953	4,503,278	4,399,408	8,902,686	102.4	25.4		3,660.7	2.9	41.1
1954	4,597,667	4,492,269	9,089,936	102.3	33.9	14.3	3,702.0	2.0	40.7
1955	4,713,817	4,598,008	9,311,825	102.5	43.2		3,767.1	1.4	40.5
1956	4,828,846	4,702,025	9,530,871	102.7	42.3		3,850.1	1.5	40.4
1957	4,930,160	4,813,927	9,744,087	102.4	37.7		3,889.5	2.0	39.9
1958	5,026,095	4,921,263	9,947,358	102.1	32.3		3,940.0	2.6	39.6
1959	5,132,363	5,028,605	10,160,968	102.1	34.8		3,962.2	2.0	39.0
1960	5,253,073	5,138,847	10,391,920	102.2	38.0		4,061.5	2.4	39.1
1961	5,374,304	5,268,350	10,642,654	102.0	27.4	16.9	4,225.0	2.3	39.7
1962	5,470,040	5,376,019	10,846,059	101.7	27.6		4,287.3	3.2	39.5
1963	5,571,613	5,483,869	11,055,482	101.6	32.2		4,369.1	2.2	39.5
1964	5,682,962	5,597,467	11,280,429	101.5	44.6		4,501.5	1.7	39.9
1965	5,793,629	5,711,779	11,505,408	101.4	45.6		4,659.9	1.2	40.5
1966	5,890,642	5,814,201	11,704,843	101.3	41.8	18.4	4,903.0	1.4	41.9
1967	5,992,280	5,919,973	11,912,253	101.2	42.1		5,020.0	1.5	42.1
1968	6,108,185	6,037,397	12,145,582	101.2	45.2		5,137.0	1.6	42.3
1969	6,238,338	6,168,879	12,407,217	101.1	47.1		5,262.0	1.5	42.4
1970	6,364,877	6,298,592	12,663,469	101.1	45.5		5,474.0	1.4	43.2
1971	6,632,838	6,565,542	13,198,380	101.0	36.5	20.0	5,608.0	1.4	42.5
1972	6,735,679	6,673,609	13,409,288	100.9	27.1		5,754.0	1.9	42.9
1973	6,835,488	6,778,856	13,614,344	100.8	32.6		5,889.0	2.2	43.3
1974	6,941,940	6,890,038	13,831,978	100.8	40.4		5,996.0	1.7	43.3
1975	7,002,232	6,966,649	13,968,881	100.5	12.9		6,120.0	2.4	43.8
1976	7,065,779	7,044,328	14,110,107	100.3	24.2	20.2	6,191.0	4.6	43.9
1977	7,145,407	7,136,126	14,281,533	100.1	36.6		6,355.0	4.7	44.5
1978	7,213,574	7,217,256	14,430,830	99.9	32.4		6,404.0	5.7	44.4
1979	7,293,341	7,309,140	14,602,481	99.8	34.2		6,456.0	6.3	44.2
1980	7,391,427	7,415,943	14,807,370	99.7	46.7		6,676.0	6.2	45.1
1981	7,514,339	7,539,778	15,054,117	99.7	49.0	20.3	6,810.3	5.9	45.2
1982	7,633,179	7,655,712	15,288,891	99.7	43.5		6,909.8	6.2	45.2
1983	7,730,415	7,753,081	15,483,496	99.7	27.0		6,997.4	9.0	45.2

Table A2 (cont.)

Year	Population					Labour force			
	Males	Females	Persons	Sex ratio	Net migration share of population increase (%)	Proportion of population born overseas (%)	Labour force ('000 persons)	Unemployment rate (%)	Participation rate (%)
1984	7,826,368	7,850,914	15,677,282	99.7	30.6		7,135.1	9.6	45.5
1985	7,940,033	7,960,533	15,900,566	99.7	32.4		7,300.3	8.6	45.9
1986	8,057,320	8,081,449	16,138,769	99.7	43.2	20.8	7,587.6	7.9	47.0
1987	8,181,746	8,212,895	16,394,641	99.6	50.0		7,757.6	8.3	47.3
1988	8,325,068	8,362,014	16,687,082	99.6	57.4		7,974.5	7.8	47.8
1989	8,446,656	8,490,067	16,936,723	99.5	51.0		8,227.8	6.6	48.6
1990	8,560,533	8,609,235	17,169,768	99.4	40.9		8,443.6	6.2	49.2
1991	8,659,623	8,719,358	17,378,981	99.3	37.5	22.9	8,490.0	8.4	48.9
1992	8,744,793	8,812,340	17,557,133	99.2	26.9		8,562.0	10.4	48.8
1993	8,821,492	8,897,598	17,719,090	99.1	20.1		8,618.7	11.0	48.6
1994	8,906,001	8,987,432	17,893,433	99.1	29.6		8,776.1	10.5	49.0
1995	9,014,765	9,104,851	18,119,616	99.0	45.1		9,000.1	8.9	49.7
1996	9,112,568	9,217,511	18,330,079	98.9	43.8	23.3	9,119.3	8.4	49.8
1997	9,195,994	9,314,010	18,510,004	98.7	37.1		9,206.7	8.6	49.7
1998	9,288,411	9,417,209	18,705,620	98.6	42.2		9,338.6	8.0	49.9
1999	9,390,061	9,529,149	18,919,210	98.5	45.9		9,414.3	7.4	49.8
2000	9,496,927	9,644,109	19,141,036	98.5	47.8		9,590.5	6.6	50.1
2001	9,618,412	9,768,049	19,386,461	98.5	53.4	23.1	9,746.2	6.4	50.3
2002	9,729,203	9,876,238	19,605,441	98.5	48.6		9,901.2	6.7	50.5
2003	9,842,057	9,985,098	19,827,155	98.6	48.1		10,084.6	6.2	50.9
2004	9,952,665	10,093,338	20,046,003	98.6	47.2		10,212.9	5.7	50.9
2005	10,087,382	10,224,161	20,311,543	98.7	50.5		10,529.0	5.2	51.8
2006	10,248,923	10,378,624	20,627,547	98.8	56.6	24.6	10,772.8	5.0	52.2
2007	10,449,776	10,566,345	21,016,121	98.9	61.4		11,060.1	4.5	52.6
2008	10,689,738	10,785,887	21,475,625	99.1	67.0		11,359.8	4.2	52.9

2009	10,886,022	10,979,601	21,865,623	99.1	60.8		11,602.5	5.0	53.1
2010	11,034,979	11,137,490	22,172,469	99.1	52.1	27.0	11,805.7	5.5	53.2

Sources:

Population and sex ratio

1788–1980 ABS (2008)

1981–2012 ABS (2012a)

1992–2011 Recast as described in ABS (2012a).

Population at December each year; includes estimates of the Indigenous population from 1961 onwards.

Sex ratio is the number of males per 100 females.

Net migration share

Net overseas migration as a percentage of the sum of natural increase plus net overseas migration.

1837–1850 Compiled from Vamplew (1987, Table EC 15–22, p. 104; Table EC 168–70, p. 114; Table ES 265–68, p. 121; Table EC 344–45, p. 124).

1851–1860 Statistical Returns for the Colony of New South Wales, South Australia, Van Diemen's Land, Victoria and Western Australia (individual years)

1861–2010 ABS, cat. no. 3101.0 (various dates); ABS (1997)

Proportion of the Australian population born overseas (%)

1861–1891 Vamplew (1987, pp. 8–9)

1901–2010 ABS, cat. no. 1301.0 (various dates)

Labour force

1841–1901 Vamplew (1987, p. 147). Figures are in calendar years.

1901–1966 In census years, source is Vamplew (1987, p. 147). Years between census dates given in Vamplew (1987) and are interpolated following year to year patterns given in M. W. Butlin (1977, Table IV.5, pp. 90–92).

1966–1980 Foster (1996, p. 180)

1981 onwards ABS, cat. no. 6202.0 (various dates)

Unemployment rate

1861–1901 Pope and Withers (1985)

1901–02 to 1973–74 M. W. Butlin (1977, Table IV.5, pp. 90–2)

1974–75 to 1996–97 RBA (2013a, Table 4.3)

1978–79 to 2011–12 ABS (2012g)

Data is for financial years ending in the year indicated.

Participation rate

The rate represents labour force as a percentage of (total) population.

Openness

Table A3 Exports, imports, openness and current account deficit, 1822–2010

Year	Exports (\$ m)	Imports (\$ m)	Balance of trade (\$ m)	Openness ratio (% GDP)	Current account (\$ m)	Current account (% GDP)	Terms of trade
1822	0.12	0.04	0.07	6.1			
1823	0.05	0.03	0.02	2.8			
1824	0.03	0.12	−0.10	4.9			
1825	0.05	0.78	−0.73	24.2			
1826	0.09	0.92	−0.83	27.9			
1827	0.12	1.03	−0.91	29.6			
1828	0.18	1.62	−1.44	42.2			
1829	0.25	1.85	−1.59	44.3			
1830	0.29	1.58	−1.29	35.0			
1831	0.93	1.71	−0.78	45.6			
1832	1.08	2.05	−0.96	51.3			
1833	1.10	2.23	−1.13	48.6			
1834	1.58	3.01	−1.43	52.7			
1835	2.39	3.50	−1.10	50.5			
1836	2.63	3.66	−1.03	46.4			
1837	3.17	3.58	−0.41	47.2			
1838	3.32	4.97	−1.65	55.0			
1839	4.26	6.66	−2.39	64.6			
1840	5.19	8.61	−3.42	67.5			
1841	4.41	8.17	−3.76	61.3			
1842	4.07	4.72	−0.66	50.4			
1843	3.87	4.81	−0.94	54.2			
1844	3.74	3.06	0.68	42.6			
1845	4.70	3.92	0.78	49.1			

1846	5.31	5.10	0.21	52.0			
1847	6.31	6.29	0.03	57.5			
1848	6.20	5.16	1.04	43.2			
1849	6.25	6.04	0.21	46.3			
1850	7.83	7.27	0.56	52.7			
1851	9.03	8.02	1.01	51.1			
1852	29.01	14.85	14.15	76.1			
1853	36.51	52.92	-16.41	91.8			
1854	36.26	57.02	-20.77	74.4			
1855	37.63	38.55	-0.91	56.6			
1856	43.68	46.71	-3.03	67.0			
1857	44.93	53.95	-9.02	70.6			
1858	41.84	48.82	-6.99	62.1			
1859	43.16	50.03	-6.88	60.4			
1860	41.74	50.98	-9.24	56.7			
1861	34.82	35.30	-0.48	41.7	-5.0	-3.0	
1862	36.14	41.20	-5.06	45.9	-10.0	-5.9	
1863	38.68	42.50	-3.82	48.7	-10.2	-6.1	
1864	37.96	41.00	-3.04	47.0	-9.0	-5.4	
1865	39.42	41.32	-1.90	47.0	-8.6	-5.0	
1866	37.96	42.62	-4.66	44.6	-11.8	-6.5	
1867	36.76	31.92	4.84	36.4	-2.6	-1.4	
1868	43.30	36.88	6.42	40.9	-1.6	-0.8	
1869	40.14	39.82	0.32	39.6	-8.2	-4.1	
1870	36.02	35.66	0.36	34.3	-7.4	-3.5	
1871	43.46	34.04	9.42	36.6	0.6	0.3	108.6
1872	45.04	37.66	7.38	36.4	-2.2	-1.0	III.7
1873	52.74	49.14	3.60	38.2	-6.0	-2.3	106.4
1874	51.30	49.10	2.20	34.9	-9.0	-3.1	108.6
1875	49.96	49.88	0.08	33.2	-10.8	-3.6	III.8

Table A3 (cont.)

Year	Exports (\$ m)	Imports (\$ m)	Balance of trade (\$ m)	Openness ratio (% GDP)	Current account (\$ m)	Current account (% GDP)	Terms of trade
1876	47.08	47.92	-0.84	30.5	-12.6	-4.0	112.9
1877	46.22	51.60	-5.38	31.2	-16.8	-5.4	108.4
1878	47.54	52.36	-4.82	30.8	-18.0	-5.6	106.0
1879	42.36	48.46	-6.10	27.2	-19.2	-5.7	110.5
1880	54.52	45.88	8.64	29.2	-6.0	-1.7	113.6
1881	55.06	58.14	-3.08	31.2	-17.6	-4.9	112.4
1882	54.62	72.20	-17.58	33.2	-33.6	-8.8	114.7
1883	60.12	70.90	-10.78	31.8	-29.4	-7.1	115.9
1884	57.42	73.98	-16.56	30.5	-35.8	-8.3	114.9
1885	53.34	73.72	-20.38	28.8	-41.0	-9.3	112.3
1886	43.40	68.36	-24.96	24.7	-46.0	-10.2	108.7
1887	46.84	59.14	-12.30	22.4	-37.6	-8.0	108.6
1888	57.80	73.76	-15.96	26.2	-42.8	-8.5	108.2
1889	59.10	75.16	-16.06	25.1	-45.4	-8.5	105.4
1890	58.64	70.34	-11.70	23.3	-41.4	-7.5	102.8
1891	72.08	75.42	-3.34	27.3	-34.0	-6.3	99.2
1892	66.74	60.22	6.52	25.6	-22.2	-4.5	96.1
1893	66.46	47.54	18.92	26.4	-8.6	-2.0	92.6
1894	64.26	43.80	20.46	26.9	-6.4	-1.6	87.5
1895	67.28	46.40	20.88	29.5	-6.4	-1.7	86.7
1896	65.92	59.32	6.60	31.2	-21.8	-5.4	88.6
1897	75.56	63.92	11.64	33.4	-16.0	-3.8	87.4
1898	80.34	62.96	17.38	32.5	-11.0	-2.5	87.7
1899	97.20	68.66	28.54	34.7	-1.8	-0.4	101.0
1900	91.92	82.78	9.14	35.5	-20.8	-4.2	104.5
1901	70.60	76.00	-5.40	29.1	-4.6	-0.9	93.5

1902	58.60	71.80	-13.20	24.4	-13.8	-2.6	101.3
1903	59.60	66.80	-7.20	24.5	-7.8	-1.5	110.9
1904	79.20	65.60	13.60	26.8	13.2	2.4	112.2
1905	89.80	67.40	22.40	29.4	19.6	3.7	118.1
1906	105.60	77.80	27.80	31.8	22.2	3.8	116.2
1907	123.80	91.40	32.40	33.2	24.6	3.8	114.7
1908	99.80	89.00	10.80	29.3	3.0	0.5	111.0
1909	112.60	91.60	21.00	29.6	12.0	1.7	110.9
1910	139.40	107.20	32.20	32.9	20.2	2.7	111.4
1911	134.80	118.60	16.20	30.8	1.6	0.2	106.8
1912	133.40	139.60	-6.20	30.9	-24.6	-2.8	107.3
1913	150.00	142.80	7.20	30.3	-12.8	-1.3	109.5
1914	145.20	145.60	-0.40	27.9	-29.6	-2.8	107.5
1915	115.80	116.80	-1.00	23.0	-25.0	-2.5	108.6
1916	140.00	141.80	-1.80	24.1	-45.0	-3.9	107.4
1917	219.80	140.00	79.80	29.2	12.2	1.0	105.6
1918	187.00	111.40	75.60	23.3	-88.6	-6.9	98.4
1919	203.20	174.00	29.20	27.4	-58.0	-4.2	84.5
1920	276.20	193.40	82.80	31.1	26.2	1.7	82.6
1921	239.40	311.40	-72.00	33.1	-135.8	-8.2	71.1
1922	245.20	189.40	55.80	26.2	-1.8	-0.1	67.6
1923	238.40	238.40	0.00	26.2	-66.2	-3.6	97.4
1924	243.60	252.60	-9.00	26.3	-83.6	-4.4	132.2
1925	320.40	260.00	60.40	28.0	-15.8	-0.8	154.2
1926	281.80	274.20	7.60	27.8	-76.2	-3.8	111.8
1927	264.60	298.00	-33.40	27.0	-125.8	-6.0	112.3
1928	273.60	268.40	5.20	25.9	-89.2	-4.3	125.1
1929	273.80	267.00	6.80	26.2	-89.4	-4.3	116.8
1930	192.20	246.80	-54.60	23.3	-158.8	-8.4	93.5
1931	179.60	123.60	56.00	19.6	-37.0	-2.4	70.9

Table A3 (cont.)

Year	Exports (\$ m)	Imports (\$ m)	Balance of trade (\$ m)	Openness ratio (% GDP)	Current account (\$ m)	Current account (% GDP)	Terms of trade
1932	193.80	101.20	92.60	20.2	19.6	1.3	70.9
1933	197.40	129.00	68.40	21.4	-6.0	-0.4	74.9
1934	228.40	135.00	93.40	22.3	17.6	1.1	97.3
1935	206.80	164.60	42.20	21.5	-31.0	-1.8	81.5
1936	248.20	189.80	58.40	23.1	-19.2	-1.0	101.3
1937	296.40	206.00	90.40	24.3	20.4	1.0	117.5
1938	282.60	254.40	28.20	24.0	-47.6	-2.1	98.8
1939	244.20	218.80	25.40	21.1	-46.0	-2.1	81.6
1940	303.00	246.60	56.40	23.0	-51.0	-2.1	84.5
1941	288.80	204.20	84.60	19.1	-73.0	-2.8	75.7
1942	266.20	210.20	56.00	15.8	-65.0	-2.2	66.5
1943	234.00	141.20	92.80	10.9	-34.6	-1.0	62.0
1944	272.80	138.20	134.60	11.7	187.6	5.4	59.7
1945	273.60	165.80	107.80	12.8	133.6	3.9	64.7
1946	299.00	215.00	84.00	14.5	100.0	2.8	71.3
1947	527.00	408.00	119.00	24.9	-91.0	-2.4	86.6
1948	792.00	660.00	132.00	32.2	13.0	0.3	103.0
1949	1,042.00	817.00	225.00	35.7	62.0	1.2	115.4
1950	1,184.00	1,048.00	136.00	36.3	-71.0	-1.2	117.0
1951	1,948.00	1,441.00	507.00	41.6	249.0	3.1	171.2
1952	1,326.00	2,033.00	-707.00	38.2	-1,088.0	-12.4	107.4
1953	1,690.00	1,000.00	690.00	27.0	389.0	3.9	116.4
1954	1,622.00	1,323.00	299.00	27.1	-4.0	0.0	120.9
1955	1,520.00	1,642.00	-122.00	27.3	-477.0	-4.1	110.3
1956	1,537.00	1,597.00	-60.00	25.0	-448.0	-3.6	99.5
1957	1,954.00	1,381.00	573.00	24.4	217.0	1.6	106.9

1958	1,610.00	1,521.00	89.00	22.4	-309.0	-2.2	99.8
1959	1,612.00	1,554.00	58.00	21.1	-386.0	-2.6	89.1
1960	1,860.00	1,814.00	46.00	22.1	-460.0	-2.8	99.7
1961	1,847.00	2,056.00	-209.00	22.2	-737.0	-4.2	94.3
1962	2,129.00	1,701.00	428.00	21.6	-11.0	-0.1	95.4
1963	2,122.00	2,065.00	57.00	21.8	-471.0	-2.5	96.6
1964	2,731.00	2,237.00	494.00	23.4	-62.0	-0.3	105.8
1965	2,574.00	2,739.00	-165.00	22.9	-788.0	-3.4	100.7
1966	2,626.00	2,822.00	-196.00	22.4	-895.0	-3.7	101.3
1967	2,926.00	2,837.00	89.00	21.2	-663.0	-2.4	100.0
1968	2,942.00	3,159.00	-217.00	20.9	-1,146.0	-3.9	96.5
1969	3,217.00	3,203.00	14.00	19.6	-1,011.0	-3.1	98.4
1970	3,969.00	3,553.00	416.00	20.4	-717.0	-1.9	99.0
1971	4,217.00	3,790.00	427.00	19.9	-801.0	-2.0	93.3
1972	4,780.00	3,803.00	977.00	19.3	-356.0	-0.8	93.1
1973	6,102.00	3,838.00	2,264.00	20.0	691.0	1.4	112.3
1974	6,811.00	5,824.00	987.00	21.0	-944.0	-1.6	118.4
1975	8,671.00	7,728.00	943.00	23.1	-1,269.0	-1.8	104.8
1976	9,603.00	7,957.00	1,646.00	21.1	-1,436.0	-1.7	100.2
1977	11,641.00	10,455.00	1,186.00	23.0	-2,442.0	-2.5	97.1
1978	12,198.00	11,225.00	973.00	22.3	-3,056.0	-2.9	88.3
1979	14,210.00	13,527.00	683.00	23.4	-3,805.0	-3.2	89.1
1980	18,979.00	16,006.00	2,973.00	26.0	-2,071.0	-1.5	92.1
1981	19,148.00	19,447.00	-299.00	25.3	-5,225.0	-3.4	91.5
1982	19,586.00	22,704.00	-3,118.00	24.1	-8,449.0	-4.8	89.9
1983	21,314.00	21,983.00	-669.00	22.9	-6,079.0	-3.2	88.5
1984	23,830.00	23,700.00	130.00	22.2	-7,202.0	-3.4	90.8
1985	30,201.00	30,512.00	-311.00	25.8	-10,433.0	-4.4	89.4
1986	32,558.00	36,081.00	-3,523.00	26.4	-14,506.0	-5.6	80.9
1987	36,435.00	37,250.00	-815.00	25.8	-11,448.0	-4.0	76.4

Table A3 (cont.)

Year	Exports (\$ m)	Imports (\$ m)	Balance of trade (\$ m)	Openness ratio (% GDP)	Current account (\$ m)	Current account (% GDP)	Terms of trade
1988	41,856.00	40,507.00	1,349.00	25.4	-10,424.0	-3.2	83.1
1989	44,126.00	47,370.00	-3,244.00	24.9	-18,481.0	-5.0	95.1
1990	49,082.00	51,364.00	-2,282.00	24.8	-23,179.0	-5.7	95.3
1991	52,622.00	49,684.00	2,938.00	24.6	-16,577.0	-4.0	90.2
1992	55,380.00	51,316.00	4,064.00	25.2	-12,755.0	-3.0	87.4
1993	60,756.00	59,830.00	926.00	27.1	-14,082.0	-3.2	83.7
1994	64,438.00	64,823.00	-385.00	27.6	-15,213.0	-3.3	81.5
1995	67,232.00	75,256.00	-8,024.00	28.7	-26,374.0	-5.3	84.1
1996	75,913.00	78,096.00	-2,183.00	29.1	-20,456.0	-3.9	86.6
1997	80,922.00	79,381.00	1,541.00	28.8	-16,195.0	-2.9	89.1
1998	88,534.00	92,184.00	-3,650.00	30.7	-22,630.0	-3.8	88.3
1999	85,696.00	97,818.00	-12,122.00	29.5	-32,452.0	-5.2	83.8
2000	97,726.00	109,980.00	-12,254.00	31.4	-31,483.0	-4.8	87.3
2001	120,347.00	120,626.00	-279.00	34.1	-17,684.0	-2.5	89.2
2002	121,126.00	121,996.00	-870.00	32.2	-19,163.0	-2.5	90.3
2003	116,079.00	134,097.00	-18,018.00	31.2	-38,228.0	-4.8	91.9
2004	109,096.00	132,461.00	-23,365.00	28.1	-46,366.0	-5.4	98.5
2005	128,125.00	150,821.00	-22,696.00	30.3	-57,544.0	-6.2	107.9
2006	154,088.00	169,583.00	-15,495.00	32.5	-54,205.0	-5.4	119.8
2007	169,790.00	184,117.00	-14,327.00	32.7	-61,073.0	-5.6	129.4
2008	183,121.00	205,445.00	-22,324.00	33.0	-72,798.0	-6.2	136.8
2009	231,572.00	221,287.00	10,285.00	36.2	-38,184.0	-3.0	146.5
2010	201,916.00	205,669.00	-3,753.00	31.5	-57,518.0	-4.4	139.5

Sources:

Exports, imports and balance of trade

1822–50 Merchandise exports and imports compiled from Vamplew (1987, Table EC 80–8, p. 109; Table EC 209–17, p. 118; Table EC 283–99, p. 122; Table EC 331–43, p. 124).

1851–60 Continued on the same basis (merchandise imports and exports) from Statistical Returns for the Colony of New South Wales, South Australia, Van Diemen's Land, Victoria and Western Australia (individual years).

1861–1971 Vamplew (1987, pp. 185–98)

1972–2010 RBA (2013b)

1913 and earlier are for calendar years. 1914 and after are for financial years. 1914 raw data is six-monthly, so is doubled here for the yearly figure.

Openness

Openness is the ratio of the sum of merchandise exports and merchandise imports to GDP.

Nominal GDP Hutchinson (2013).

Current account

1861–1981 Vamplew (1987, pp. 185–98)

1982 onwards RBA (2013b)

Current account balance is as a percentage of GDP.

Nominal GDP Hutchinson (2012a)

Terms of trade

1870–1905 Bambrick (1970). These data have been converted to financial years then spliced to M. W. Butlin (1977) for the period 1906–1974. From 1975 onwards the data come from ABS, cat. no. 5206.0 (various dates), spliced onto M. W. Butlin (1977) from 1975. The data have been converted to an index with 1966–67 = 100.

Industry assistance

Table A4 Industry assistance, 1904–2005

Year	Average nominal assistance to agriculture (%)	Average nominal assistance to manufacturing (%)	Relative rate of assistance (RRA)
1904	6.5	29.7	21.8
1905	11.6	28.8	15.4
1906	6.8	28.0	19.9
1907	6.7	26.7	18.7
1908	8.0	26.2	16.8
1909	7.8	30.6	21.1
1910	9.2	30.5	19.5
1911	8.8	30.3	19.8
1912	9.3	28.6	17.7
1913	7.6	27.8	18.8
1914	6.0	28.1	20.8
1915	4.8	28.7	22.9
1916	5.1	25.5	19.4
1917	4.9	25.0	19.1
1918	6.2	20.7	13.7
1919	4.5	19.8	14.7
1920	4.7	22.6	17.1
1921	3.1	21.4	17.7
1922	4.1	26.7	21.7
1923	3.9	25.6	20.8
1924	5.6	25.8	19.1
1925	4.0	27.3	22.4
1926	4.6	29.3	23.6
1927	4.8	30.3	24.3
1928	5.2	31.9	25.4
1929	4.9	32.9	26.7
1930	7.4	39.3	29.7
1931	7.1	52.2	42.1
1932	8.7	72.0	58.2
1933	8.1	65.0	52.7
1934	6.4	63.6	53.7
1935	9.1	57.7	44.6
1936	6.0	55.2	46.4
1937	4.2	54.4	48.1
1938	3.0	48.8	44.5
1939	5.9	55.6	46.9
1940	4.3	52.8	46.5

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1941	4.1	60.4	54.1
1942	4.9	47.4	40.5
1943	6.1	51.8	43.1
1944	9.5	52.2	39.0
1945	11.4	54.8	39.0
1946	7.4	47.1	37.0
1947	-13.5	46.9	69.8
1948	-4.6	29.7	36.0
1949	-4.9	27.0	33.5
1950	-4.9	26.2	32.7
1951	-3.2	24.5	28.6
1952	-1.1	23.0	24.4
1953	2.5	33.9	30.6
1954	4.5	26.3	20.9
1955	6.1	22.9	15.8
1956	5.3	22.0	15.9
1957	7.9	21.9	13.0
1958	10.3	19.8	8.6
1959	7.5	21.7	13.2
1960	8.9	21.2	11.3
1961	11.0	20.0	8.1
1962	10.3	22.1	10.7
1963	9.8	22.0	11.1
1964	7.2	22.3	14.1
1965	9.1	22.9	12.6
1966	10.6	22.0	10.3
1967	9.6	22.4	11.7
1968	15.4	22.8	6.4
1969	13.8	23.0	8.1
1970	14.2	23.3	8.6
1971	17.5	25.5	4.7
1972	12.8	26.6	9.0
1973	7.5	30.1	13.5
1974	3.9	26.8	17.4
1975	2.4	28.6	14.3
1976	4.5	29.7	10.0
1977	5.4	29.4	10.1
1978	5.9	29.0	8.6
1979	4.3	31.3	10.3
1980	3.1	28.8	11.5
1981	3.6	28.4	11.0
1982	3.7	27.7	10.9
1983	8.0	28.1	7.4
1984	6.3	27.0	9.1
1985	5.6	27.0	7.0
1986	6.1	26.3	6.5
1987	8.8	24.8	2.9

Table A4 (*cont.*)

Year	Average nominal assistance to agriculture (%)	Average nominal assistance to manufacturing (%)	Relative rate of assistance (RRA)
1988	5.8	24.3	5.9
1989	4.3	23.5	6.4
1990	3.6	22.9	6.2
1991	6.5	21.3	2.3
1992	4.5	20.4	4.3
1993	4.0	18.9	3.8
1994	3.7	17.1	3.2
1995	3.5	16.1	2.4
1996	3.0	14.7	1.9
1997	3.1	12.2	1.8
1998	2.7	11.3	1.3
1999	2.7	10.9	0.3
2000	2.1	10.6	0.9
2001	0.0	11.2	3.0
2002	0.0	10.4	3.0
2003	0.0	10.0	3.0
2004	0.0	10.0	3.0
2005	0.0	9.5	3.0

Notes:

Average nominal assistance to agriculture is nominal rate of assistance on all covered agricultural commodities.

Average nominal assistance to manufacturing is average duty paid on dutiable imports.

RRA is relative rate of assistance to manufacturing and is arrived at by computing the ratio of one plus the average nominal assistance to manufacturing to one plus the average nominal assistance to agriculture, subtracting one from the result and multiplying that by 100 to give a percentage.

Data are for financial years ending in the year indicated.

Source: Lloyd & MacLaren (2013).

Private capital formation

Table A5 Private capital formation, 1861–2010

Year	Private dwelling investment on GDP (%)	Private non-dwelling investment on GDP (%)
1861	2.6	2.2
1862	2.6	1.3
1863	3.0	4.4
1864	3.9	2.5
1865	3.5	3.1
1866	2.8	2.6
1867	3.2	1.7
1868	2.6	4.4
1869	3.1	3.4
1870	2.9	2.7
1871	2.4	2.1
1872	3.4	4.4
1873	3.0	4.1
1874	2.7	4.4
1875	2.7	5.8
1876	3.6	5.3
1877	2.6	9.3
1878	2.4	6.5
1879	2.6	4.0
1880	2.3	6.2
1881	3.5	7.7
1882	3.4	4.4
1883	5.0	3.3
1884	4.6	4.0
1885	3.9	3.9
1886	3.3	6.2
1887	4.2	6.0
1888	4.3	6.3
1889	2.6	6.1
1890	3.0	3.8
1891	2.3	6.1
1892	2.0	2.2
1893	1.6	1.4
1894	2.1	2.6
1895	1.8	1.3
1896	1.8	3.4
1897	0.8	1.0
1898	1.8	3.2
1899	0.9	3.5
1900	0.8	2.9
1901	1.8	3.6

Table A5 (*cont.*)

Year	Private dwelling investment on GDP (%)	Private non-dwelling investment on GDP (%)
1902	3.4	4.1
1903	2.5	4.1
1904	2.0	3.3
1905	2.2	3.2
1906	2.1	3.5
1907	2.9	4.5
1908	2.9	4.0
1909	1.9	3.6
1910	1.7	3.6
1911	1.6	3.9
1912	2.4	4.2
1913	3.3	4.1
1914	3.3	4.1
1915	3.0	2.4
1916	2.0	2.2
1917	1.5	3.2
1918	1.5	2.8
1919	1.9	3.7
1920	2.1	4.6
1921	1.7	4.8
1922	2.5	5.4
1923	3.3	4.8
1924	3.5	4.8
1925	3.2	4.1
1926	3.5	4.1
1927	3.7	3.8
1928	3.7	3.6
1929	3.3	3.7
1930	2.6	2.6
1931	1.6	3.0
1932	1.0	2.4
1933	1.7	2.2
1934	1.8	2.9
1935	2.1	3.8
1936	2.5	3.7
1937	2.6	3.7
1938	2.7	4.5
1939	2.9	4.4
1940	2.4	4.8
1941	2.1	3.7
1942	1.1	2.7
1943	0.4	2.0
1944	0.3	2.3

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1945	0.4	3.0
1946	0.8	4.8
1947	1.8	5.9
1948	2.1	6.0
1949	2.8	6.8
1950	3.1	7.4
1951	3.3	8.0
1952	3.9	8.9
1953	3.6	7.8
1954	3.5	8.6
1955	3.6	9.2
1956	3.5	9.6
1957	3.2	9.3
1958	3.6	9.7
1959	3.7	9.1
1960	4.3	10.5
1961	4.5	11.0
1962	3.9	10.8
1963	4.0	11.1
1964	4.2	11.2
1965	4.6	11.9
1966	4.4	12.5
1967	4.3	11.6
1968	4.5	11.5
1969	4.6	11.9
1970	4.7	11.2
1971	4.5	12.2
1972	4.8	11.9
1973	5.2	10.9
1974	5.2	10.5
1975	4.2	10.5
1976	5.1	10.3
1977	5.7	10.1
1978	5.7	10.4
1979	5.4	11.6
1980	5.5	10.9
1981	6.2	12.0
1982	5.9	12.8
1983	4.7	11.5
1984	4.7	10.5
1985	5.1	11.0
1986	5.0	12.0
1987	4.3	12.5
1988	4.4	13.1
1989	5.5	13.1
1990	5.3	12.4
1991	4.8	10.3

Table A5 (*cont.*)

Year	Private dwelling investment on GDP (%)	Private non-dwelling investment on GDP (%)
1992	4.9	8.8
1993	5.3	9.0
1994	5.8	9.3
1995	5.7	10.6
1996	4.8	11.0
1997	4.7	11.0
1998	5.3	11.6
1999	5.5	11.6
2000	6.1	11.4
2001	4.8	10.5
2002	5.5	10.5
2003	6.1	11.6
2004	6.4	11.9
2005	6.3	12.5
2006	6.0	13.6
2007	5.6	13.5
2008	5.5	14.0
2009	5.3	14.1
2010	5.3	12.5

Sources:

Ratios are derived from current price investment and current price GDP.

Current price investment

1861–1900 Vamplew (1987, p. 134)

1900–01 to 1958–59 M. W. Butlin (1977, Table IV.1, pp. 78–80)

1959–60 ABS, cat. no. 5206.0 (various dates)

Data is for calendar years up to 1900, and financial years (ending in the year indicated) after that date.

Current price GDP is from Hutchinson (2012a).

Financial

Table A6 Financial returns and selected asset prices, 1875–2010

Year	Stock index (index year 1990 = 100)	Median house prices in AUD (‘000)	Yields (%)			
			Bills	Bonds	Equity premium	Real bond yield
1875	5.4					
1876	5.1					
1877	5.3					
1878	5.3					
1879	4.2					
1880	4.8	0.75				
1881	5.5	0.79				
1882	6.2	0.78				
1883	7.0	0.77	5.5	3.8	25.2	6.7
1884	7.4	0.89	4.8	3.7	0.7	12.5
1885	7.4	0.82	4.8	3.8	7.5	-6.0
1886	7.5	0.90	5.8	3.8	-0.9	-0.6
1887	7.7	0.93	4.0	3.6	24.6	7.6
1888	9.3	0.94	5.0	3.4	22.8	6.3
1889	10.5	1.07	5.0	3.4	-4.5	2.4
1890	9.1	0.97	4.5	3.5	-2.1	2.7
1891	8.8	1.00	5.3	3.8	-14.2	3.7
1892	8.2	0.90	5.3	3.8	2.5	6.8
1893	7.1	0.77	5.4	3.8	-8.7	10.1
1894	7.2	0.59	3.0	3.5	7.1	8.9
1895	7.5	0.60	3.9	3.3	16.8	2.5
1896	8.5	0.58	3.4	3.2	-1.5	2.0
1897	8.2	0.67	3.6	3.0	5.5	-1.2
1898	8.3	0.60	3.6	3.3	12.2	8.1
1899	9.2	0.61	3.6	3.5	8.6	3.2
1900	9.6	0.66	3.5	3.3	8.9	3.7
1901	9.7	0.73	3.5	3.3	-6.5	-1.8
1902	9.3	0.76	3.5	3.5	12.1	-2.9
1903	10.5	0.69	3.5	3.6	18.3	5.6
1904	12.0	0.66	3.8	3.7	3.8	9.8
1905	12.9	0.66	3.8	3.5	11.1	-0.8
1906	13.7	0.73	3.6	3.5	6.7	3.5
1907	14.0	0.76	3.6	3.5	5.3	3.5
1908	15.9	0.80	3.6	3.5	13.8	-2.8
1909	17.3	0.83	3.6	3.6	9.9	3.6
1910	18.2	0.83	3.6	3.8	2.9	1.8
1911	19.4	0.86	3.6	3.8	6.9	1.9
1912	19.6	0.97	3.6	3.9	4.7	-7.4
1913	20.3	1.00	3.6	4.3	4.6	4.3

Table A6 (cont.)

Year	Stock index (index year 1990 = 100)	Median house prices in AUD (‘000)	Yields (%)			
			Bills	Bonds	Equity premium	Real bond yield
1914	23.9	1.01	3.6	4.3	7.1	0.9
1915	22.6	1.06	3.6	4.6	-8.1	-10.2
1916	19.3	1.01	3.6	4.9	-8.3	3.5
1917	19.7	1.06	3.6	4.7	10.8	-0.9
1918	20.3	1.21	3.6	5.0	2.5	-1.7
1919	22.3	1.29	3.6	5.4	13.3	-8.4
1920	25.9	1.58	4.5	6.7	1.4	-6.5
1921	25.8	1.58	4.5	5.9	14	18.5
1922	29.1	1.55	4.5	5.7	15.6	9.0
1923	35.0	1.74	4.5	5.9	10.3	3.6
1924	36.4	1.78	4.9	5.4	8.3	6.5
1925	38.2	1.74	4.9	5.2	12.5	5.2
1926	42.7	1.78	4.9	5.3	8.8	3.0
1927	46.6	1.72	5.3	5.4	7	6.5
1928	49.9	1.81	5.3	5.3	12.4	5.3
1929	53.5	1.81	5.3	5.6	-10.9	3.4
1930	38.9	1.52	5.8	6.5	-36.1	10.9
1931	30.2	1.38	4.5	4.7	13	15.0
1932	35.7	1.32	3.9	3.9	20.9	9.0
1933	46.0	1.33	3.8	3.6	22	7.7
1934	51.6	1.37	2.6	3.3	19.9	0.5
1935	60.8	1.41	2.6	3.7	6.4	2.3
1936	66.1	1.44	3.5	4.0	15.8	2.6
1937	71.7	1.51	3.2	3.7	-1.3	-0.3
1938	64.8	1.52	3.8	3.9	-4.4	1.3
1939	63.6	1.55	3.7	3.8	1.5	1.3
1940	56.3	1.64	2.9	3.1	0.4	-0.6
1941	60.3	1.77	2.5	3.3	-8.8	-1.4
1942	53.4	1.94	2.5	3.2	15.2	-5.8
1943	65.6	2.06	2.5	3.2	5.7	-0.9
1944	68.1	2.05	2.5	3.2	4.8	4.2
1945	71.0	2.05	2.5	3.3	10.8	3.3
1946	81.3	2.05	2.0	3.2	10.1	1.2
1947	90.1	2.05	2.5	3.2	13.4	-0.7
1948	95.2	2.05	2.3	3.1	-0.7	-7.3
1949	84.6	2.05	2.0	3.1	5	-5.7
1950	105.2	4.39	2.0	3.2	28.2	-7.6
1951	137.0	5.22	2.0	3.8	-8.4	-21.8
1952	93.2	5.17	3.2	4.5	-17.8	-5.2
1953	94.5	4.76	3.0	4.4	8.6	2.6
1954	108.0	5.06	3.5	4.5	14.1	3.6

Statistical Appendix

1955	120.7	5.64	4.2	4.5	5.8	1.1
1956	112.1	6.27	4.7	5.1	2.6	-1.6
1957	132.3	6.52	4.4	5.0	11.7	4.2
1958	142.5	6.87	4.4	4.9	14	3.3
1959	170.7	6.94	4.1	4.8	39.5	2.5
1960	226.9	8.00	3.4	5.3	-11.5	0.8
1961	209.7	8.87	4.1	4.9	6.7	4.2
1962	198.7	8.43	3.8	4.7	-0.5	4.7
1963	214.8	9.02	3.5	4.3	22.3	3.6
1964	249.7	9.31	3.6	4.8	-0.4	1.3
1965	211.9	10.34	4.1	5.2	-13.4	1.1
1966	218.6	11.05	4.6	5.0	1.7	2.4
1967	238.6	10.72	4.3	5.1	37.4	1.9
1968	404.0	11.12	4.5	4.9	29.9	2.4
1969	384.7	12.81	4.7	5.6	4.5	2.6
1970	367.4	14.19	5.3	6.4	-20.1	1.7
1971	330.3	16.12	5.6	5.7	-11.8	-1.6
1972	414.4	17.76	4.6	5.3	31.1	0.6
1973	381.1	21.38	5.1	8.1	-33.9	-4.8
1974	271.7	25.83	9.4	9.2	-35.4	-7.1
1975	251.2	28.97	7.9	10.0	44.6	-4.4
1976	317.5	32.72	7.5	10.4	-6.8	-3.8
1977	309.0	35.74	8.9	9.5	3.7	0.2
1978	334.6	37.68	8.6	8.8	15.5	1.1
1979	389.7	40.25	9.0	10.1	28.9	0.0
1980	611.0	47.49	10.7	12.6	39.7	3.4
1981	708.4	54.55	13.6	15.0	-25.8	3.7
1982	479.4	57.70	15.6	14.0	-29.3	3.0
1983	603.4	60.75	11.7	13.5	50.2	4.9
1984	661.8	68.53	11.1	13.4	-12.9	10.8
1985	855.1	74.89	15.0	14.9	27.2	6.7
1986	1,210.8	80.31	17.1	13.4	37.7	3.6
1987	1,779.1	83.93	14.1	12.9	-22.5	5.8
1988	1,585.3	99.64	11.7	13.0	8.1	5.4
1989	1,527.7	134.67	17.3	12.9	5	5.1
1990	1,508.8	136.83	15.9	12.1	-27.4	5.2
1991	1,504.9	137.68	11.1	9.4	18.1	7.9
1992	1,652.7	141.17	6.8	8.9	-11.1	8.6
1993	1,722.6	145.13	5.3	6.7	37.5	4.8
1994	2,040.2	150.29	5.4	10.0	-15.8	7.5
1995	2,000.8	152.86	8.0	8.2	13.3	3.1
1996	2,231.7	154.68	7.4	7.4	4.3	5.9
1997	2,662.7	159.66	5.5	6.1	6.3	6.3
1998	2,608.2	175.50	5.0	5.0	6.9	3.4
1999	2,963.0	186.89	4.8	7.0	10.6	5.2
2000	3,115.9	205.51	5.9	5.5	1	-0.3
2001	3,352.4	222.59	5.1	6.0	0.1	2.9

Table A6 (*cont.*)

Year	Stock index (index year 1990 = 100)	Median house prices in AUD (‘000)	Yields (%)			
			Bills	Bonds	Equity premium	Real bond yield
2002	3,241.5	268.13	4.7	5.2	-11.4	2.2
2003	3,032.0	312.90	4.9	5.6	7.8	3.2
2004	3,499.8	341.01	5.6	5.3	22.5	2.7
2005	4,197.5	347.73	5.8	5.2	15.4	2.4
2006	4,933.5	373.49	6.0	5.9	19	2.6
2007	6,337.6	411.71	6.7	6.3	16	3.3
2008	5,513.5	445.53	7.7	4.0	-47.3	0.3
2009	3,931.8	442.36	3.3	5.7	34.7	3.6
2010	4,467.5	523.13	4.4	5.5	0.9	2.8

Sources:

Stock index

Hutchinson (2012a).

Median house prices

Based on series for six capital cities (June quarter) in Stapledon (2012).

Yields

‘Bills’ is the daily yield on 90-day bank-accepted bills.

‘Bonds’ is the daily yield on 10-year government bonds.

‘Premium’ is the return on the accumulation index less bond rate (%).

‘Real bond yield’ is the bond yield minus the inflation rate.

All yields data are from the appendix in Brailsford, Handley and Maheswaran (2012).

Living standards

Table A7 Living standards, wages, prices and housing affordability, 1801–2010

Year	Real GDP per capita	Average weekly earnings, all employees (AUD)	GDP deflator (2010 = 100)	Consumer price index (index year 1990 = 100)	Real (product) wage	Housing affordability
1801	0.0066					
1802	0.0064					
1803	0.0055					
1804	0.0059					
1805	0.0064					
1806	0.0068					
1807	0.0072					
1808	0.0066					
1809	0.0058					
1810	0.0065					
1811	0.0074					
1812	0.0070					
1813	0.0068					
1814	0.0064					
1815	0.0072					
1816	0.0071					
1817	0.0063					
1818	0.0059					
1819	0.0054					
1820	0.0048					
1821	0.0053					
1822	0.0059					
1823	0.0058					
1824	0.0054					
1825	0.0050					
1826	0.0049					
1827	0.0051					
1828	0.0053		1.5			
1829	0.0058		1.48			
1830	0.0070		1.18			
1831	0.0076		1.14			
1832	0.0074		1.14			
1833	0.0072		1.26			
1834	0.0066		1.55			
1835	0.0075		1.55			
1836	0.0080		1.6			

Table A7 (cont.)

Year	Real GDP per capita	Average weekly earnings, all employees (AUD)	GDP deflator (2010 = 100)	Consumer price index (index year 1990 = 100)	Real (product) wage	Housing affordability
1837	0.0076		1.56			
1838	0.0076		1.54			
1839	0.0067		1.93			
1840	0.0071		1.7			
1841	0.0070		1.55			
1842	0.0055		1.47			
1843	0.0054		1.14			
1844	0.0063		1			
1845	0.0067		1.09			
1846	0.0070		1.07			
1847	0.0080		0.94			
1848	0.0091		0.91			
1849	0.0095		0.86			
1850	0.0087		1			
1851	0.0090		0.92	3.04		
1852	0.0109		1.18	2.89		
1853	0.0118		1.61	3.04		
1854	0.0110		1.91	4.34		
1855	0.0097		2.02	5.63		
1856	0.0102		1.72	5.29		
1857	0.0103		1.57	4.78		
1858	0.0087		1.76	4.77		
1859	0.0089		1.69	4.72		
1860	0.0099		1.52	4.41		
1861	0.0096	2.04	1.54	3.94	1.32	
1862	0.0094	2.02	1.55	3.6	1.30	
1863	0.0091	1.94	1.52	3.47	1.28	
1864	0.0094	1.94	1.43	3.37	1.36	
1865	0.0093	1.96	1.38	3.45	1.42	
1866	0.0092	1.96	1.41	3.71	1.39	
1867	0.0096	1.98	1.35	3.47	1.47	
1868	0.0102	1.96	1.29	3.18	1.52	
1869	0.0101	1.98	1.29	3.18	1.53	
1870	0.0101	2.06	1.28	3.16	1.61	
1871	0.0100	2.02	1.28	3.1	1.58	
1872	0.0100	2.08	1.33	2.97	1.56	
1873	0.0108	2.26	1.41	2.92	1.60	
1874	0.0112	2.34	1.43	3.08	1.64	
1875	0.0116	2.4	1.4	3.29	1.71	

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1876	0.0119	2.46	1.38	3.27	1.78	
1877	0.0117	2.48	1.36	3.18	1.82	
1878	0.0121	2.44	1.32	3.03	1.85	
1879	0.0124	2.46	1.29	2.95	1.91	
1880	0.0124	2.56	1.29	3.03	1.98	293
1881	0.0127	2.58	1.28	3.07	2.02	304
1882	0.0124	2.66	1.34	3.18	1.99	295
1883	0.0125	2.76	1.38	3.23	2.00	278
1884	0.0127	2.78	1.34	3.04	2.07	320
1885	0.0127	2.78	1.33	3.05	2.09	296
1886	0.0127	2.78	1.31	3.26	2.12	325
1887	0.0130	2.8	1.27	3.26	2.20	333
1888	0.0133	2.8	1.28	3.15	2.19	337
1889	0.0135	2.78	1.33	3.12	2.09	383
1890	0.0134	2.76	1.34	3.15	2.06	353
1891	0.0133	2.76	1.28	3.16	2.16	361
1892	0.0126	2.72	1.2	3.12	2.27	333
1893	0.0112	2.6	1.15	2.97	2.26	298
1894	0.0109	2.52	1.08	2.8	2.33	235
1895	0.0106	2.52	1.05	2.73	2.40	236
1896	0.0104	2.54	1.08	2.76	2.35	230
1897	0.0104	2.58	1.12	2.83	2.30	260
1898	0.0106	2.58	1.13	2.82	2.28	234
1899	0.0113	2.6	1.14	2.76	2.28	234
1900	0.0115	2.62	1.15	2.76	2.28	253
1901	0.0111	2.66	1.19	2.82	2.24	275
1902	0.0121	2.72	1.15	2.91	2.37	278
1903	0.0111	2.72	1.18	2.91	2.31	255
1904	0.0123	2.7	1.11	2.84	2.43	244
1905	0.0119	2.66	1.12	2.88	2.38	249
1906	0.0122	2.64	1.16	2.96	2.28	275
1907	0.0138	2.78	1.14	3	2.44	274
1908	0.0125	2.9	1.23	3.1	2.36	275
1909	0.0128	2.98	1.26	3.13	2.37	277
1910	0.0132	3.12	1.3	3.13	2.40	267
1911	0.0141	3.32	1.31	3.17	2.53	260
1912	0.0134	3.58	1.42	3.29	2.52	272
1913	0.0135	3.74	1.41	3.38	2.65	266
1914	0.0137	3.86	1.51	3.45	2.56	262
1915	0.0128	3.88	1.66	3.64	2.34	272
1916	0.0130	4	1.73	4.02	2.31	254
1917	0.0128	4.26	1.88	4.12	2.27	249
1918	0.0125	4.38	1.99	4.41	2.20	275
1919	0.0125	4.92	2.09	4.73	2.35	262
1920	0.0124	5.42	2.43	5.31	2.23	292
1921	0.0127	6.42	2.35	5.41	2.73	245

Table A7 (cont.)

Year	Real GDP per capita	Average weekly earnings, all employees (AUD)	GDP deflator (2010 = 100)	Consumer price index (index year 1990 = 100)	Real (product) wage	Housing affordability
1922	0.0132	6.72	2.23	5.13	3.01	231
1923	0.0136	6.74	2.36	4.85	2.86	257
1924	0.0139	7	2.36	4.8	2.97	254
1925	0.0147	7.12	2.43	4.83	2.93	244
1926	0.0146	7.46	2.42	4.88	3.08	239
1927	0.0148	7.48	2.42	4.89	3.09	230
1928	0.0145	7.62	2.45	4.94	3.11	237
1929	0.0143	7.56	2.46	5.01	3.07	240
1930	0.0135	7.58	2.22	5.02	3.41	200
1931	0.0114	6.96	2.01	4.83	3.46	199
1932	0.0116	6.28	1.86	4.54	3.38	210
1933	0.0125	6.04	1.83	4.35	3.30	219
1934	0.0130	5.98	1.9	4.25	3.15	228
1935	0.0137	6.08	1.96	4.25	3.10	232
1936	0.0144	6.24	2.05	4.28	3.04	231
1937	0.0147	6.42	2.17	4.38	2.96	234
1938	0.0156	6.82	2.2	4.49	3.10	223
1939	0.0155	7.06	2.25	4.59	3.14	219
1940	0.0156	7.72	2.32	4.7	3.33	213
1941	0.0166	8.2	2.34	4.89	3.50	215
1942	0.0189	8.76	2.37	5.17	3.70	222
1943	0.0204	9.7	2.5	5.47	3.88	212
1944	0.0199	10.46	2.57	5.65	4.07	196
1945	0.0186	10.24	2.67	5.7	3.84	200
1946	0.0176	10.24	2.87	5.8	3.57	200
1947	0.0169	10.96	3.15	5.99	3.48	187
1948	0.0180	12.54	3.5	6.44	3.58	163
1949	0.0185	14.2	3.85	6.99	3.69	144
1950	0.0193	15.68	4.2	7.63	3.73	280
1951	0.0198	18.9	5.27	8.47	3.59	276
1952	0.0199	23.36	5.5	10.4	4.25	221
1953	0.0192	25.5	6.28	11.4	4.06	187
1954	0.0201	26.66	6.46	11.6	4.13	190
1955	0.0208	28.36	6.5	11.7	4.36	199
1956	0.0213	30.08	6.7	12.1	4.49	208
1957	0.0213	31.32	7.16	12.8	4.37	208
1958	0.0212	32.34	7.17	13	4.51	212
1959	0.0224	33.28	7.17	13.1	4.64	209
1960	0.0232	35.76	7.48	13.5	4.78	224

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1961	0.0233	37.22	7.7	14.1	4.83	238
1962	0.0230	37.96	7.7	14.1	4.93	222
1963	0.0240	38.96	7.8	14.1	4.99	232
1964	0.0252	40.66	8.1	14.3	5.02	229
1965	0.0262	43.72	8.3	14.8	5.27	237
1966	0.0263	45.3	8.5	15.3	5.33	244
1967	0.0275	48.19	8.9	15.7	5.41	222
1968	0.0284	50.96	9.1	16.3	5.60	218
1969	0.0298	56.58	9.6	16.7	5.89	226
1970	0.0312	61	10.1	17.2	6.04	233
1971	0.0318	67.49	10.6	18	6.37	239
1972	0.0317	74.66	11.2	19.3	6.67	238
1973	0.0321	82.07	12.3	20.4	6.67	260
1974	0.0329	96.61	14.3	23.1	6.76	267
1975	0.0328	122.62	16.6	26.9	7.39	236
1976	0.0333	140.32	19	30.4	7.39	233
1977	0.0341	158.85	21.1	34.6	7.53	225
1978	0.0340	174.26	22.9	37.9	7.61	216
1979	0.0351	188.21	24.8	41	7.59	214
1980	0.0357	206.36	27.3	45.2	7.56	230
1981	0.0364	233.42	29.9	49.4	7.81	234
1982	0.0370	262.55	33.4	54.6	7.86	220
1983	0.0356	291.98	36.8	60.9	7.93	208
1984	0.0368	316.85	39.7	65	7.98	216
1985	0.0382	338.48	41.7	67.8	8.12	221
1986	0.0394	358.5	44	73.5	8.15	224
1987	0.0398	380.7	47.1	80.4	8.08	220
1988	0.0414	403.75	50.7	86.3	7.96	247
1989	0.0423	431.05	55.3	92.6	7.79	312
1990	0.0431	459.7	58.7	100	7.83	298
1991	0.0424	486.65	60.5	105.3	8.04	283
1992	0.0421	500.75	61.3	107.3	8.17	282
1993	0.0434	510.98	61.8	108.4	8.27	284
1994	0.0447	525.75	62.5	110.4	8.41	286
1995	0.0460	544.65	63.8	113.9	8.54	281
1996	0.0473	558.45	65.5	118.7	8.53	277
1997	0.0486	574.58	66.3	120.3	8.67	278
1998	0.0503	592.17	67.1	120.3	8.83	296
1999	0.0522	606.08	67.4	121.8	8.99	308
2000	0.0536	619.14	69.2	124.7	8.95	332
2001	0.0540	651.8	72.5	132.2	8.99	341
2002	0.0554	678.04	74.5	136	9.10	395
2003	0.0565	707.2	76.6	140.2	9.23	442
2004	0.0582	740.06	78.9	143.5	9.38	461
2005	0.0594	770.95	82	147	9.40	451
2006	0.0604	809.06	85.9	151.7	9.42	462

Table A7 (*cont.*)

Year	Real GDP per capita	Average weekly earnings, all employees (AUD)	GDP deflator (2010 = 100)	Consumer price index (index year 1990 = 100)	Real (product) wage	Housing affordability
2007	0.0617	845.8	90.1	156.1	9.39	487
2008	0.0628	879	94.3	161.4	9.32	507
2009	0.0625	912.77	99.1	166.4	9.21	485
2010	0.0627	961.48	100	170.3	9.61	544

Sources:

Real GDP per capita is real GDP financial years divided by total population at December of first calendar year; sources are Tables 1 and 2 above.

AWE Hutchinson (2012b)

CPI Hutchinson (2012a)

Real (product) wage is AWE (\$) deflated by the GDP deflator (1990 = 100).

Housing affordability is median house prices (Table A6) divided by average weekly earnings.

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