

SECURING  
AUSTRALIA'S  
FUTURE

# Australia's Comparative Advantage

# 1

PROJECT

FINAL REPORT

AUSTRALIAN ACADEMY  
OF THE HUMANITIES  
AUSTRALIAN  
ACADEMY OF SCIENCE  
ACADEMY OF THE SOCIAL  
SCIENCES IN AUSTRALIA  
AUSTRALIAN ACADEMY  
OF TECHNOLOGICAL  
SCIENCES AND ENGINEERING



## SECURING AUSTRALIA'S FUTURE

Funded by the Australian Research Council and conducted by the four Learned Academies through the Australian Council of Learned Academies for the Australian Chief Scientist and the Commonwealth Science Council. *Securing Australia's Future* delivers evidence-based research and interdisciplinary findings to support policy development in areas of importance to Australia's future.

## EXPERT WORKING GROUP

Professor Glenn Withers AO, FASSA (Chair)  
Peter Laver AM, FTSE, HonFIEAust, FAusIMM (Deputy)  
Professor Graham Farquhar AO, FAA, FRS, NAS  
Professor Chris Gibson  
Associate Professor Sally Gras  
Professor Joseph Lo Bianco AM, FAHA  
Professor Rodney Maddock  
Dr John Prescott AC, FTSE

## AUTHORS

Professor Glenn Withers  
Dr Nitin Gupta (Executive Manager)  
Ms Lyndal Curtis  
Ms Natalie Larkins

## PROJECT MANAGER

Ms Sunita Kumar

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Telephone: +61 (0)3 98640923  
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## REPORT DESIGN

Lyrebird  
[jo@lyrebirddesign.com](mailto:jo@lyrebirddesign.com)

# Australia's Comparative Advantage



ACOLA is the interface of the four Learned Academies:

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Australian Academy of Science

Academy of the Social Sciences in Australia

Australian Academy of Technological  
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By providing a forum that brings together great minds, broad perspectives and knowledge, ACOLA is the nexus for true interdisciplinary cooperation to develop integrated problem solving and cutting edge thinking on key issues for the benefit of Australia.

ACOLA receives Australian Government funding from the Australian Research Council and the Department of Education.

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# Acronyms

ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
ABS	Australian Bureau of Statistics
ACA	Australia's Comparative Advantage
ACFS	Australian Centre for Financial Studies
ACIP	Advisory Council on Intellectual Property
ACOLA	Australian Council of Learned Academies
AFCF	Australian Financial Centre Forum
ALRC	Australian Law Reform Council
ARC	Australian Research Council
ASX	Australian Stock Exchange
CAE	Centre for Adult Education
CATI	Computer Aided Telephone Interviewing
CEDA	Committee for Economic Development of Australia
CIE	Centre for International Economics
CO	Carbon Monoxide
CO <sub>2</sub>	Carbon Dioxide
CPA	Certified Practising Accountants
CPI	Corruption Perception Index
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DPMC	Department of the Prime Minister and Cabinet
EDR	Economic Demonstrated Resources
EKC	Environmental Kuznets Curve
EPAC	Economic Planning Advisory Commission
EPI	Environmental Performance Index
ESOS	Education Services for Overseas Students
FTAS	Free Trade Agreements
GCI	Global Competitiveness Index
GDP	Gross Domestic Product
GDP	Gross Domestic Produce
GHG	Greenhouse Gases
GII	Global Innovation Index
GRDC	Grains Research and Development Corporation
GST	Goods and Services Tax
GVA	Gross Value Added
GVCS	Global Value Chains
HASS	Humanities and Social Sciences
HDI	Human Development Index

ICT	Information and Communications Technology
IMD	International Institute for Management Development
IMF	International Monetary Fund
IP	Intellectual Property
IPAA	Institute of Public Administration Australia
KPI	Key Performance Indicators
MCA	Migration Council Australia
MDB	Murray-Darling Basin
MONA	Museum of Old and New Art
N1H1	Virus-Swine Flu
NGO	Non-Governmental Organisation
NIC	US National Intelligence Council
NOX	Nitrogen Oxides
OECD	Organisation for Economic Co-operation and Development
PM10	Particulate Matter 10
PM2.5	Particulate Matter 2.5
PMI	Phillip Morris
PPP	Public–Private Partnerships
PWC	Pricewaterhouse Coopers
R&D	Research and Development
SAF	Securing Australia’s Future
SME	Small and Medium Sized Enterprises
SOX	Sulphur Oxides
SPP	Special Purpose Payments
STEM	Science, Technology, Engineering and Mathematics
TAFE	Technical and Further Education
TTCI	Travel and Tourism Competitiveness Index
UNDP	UN Development Programme
USDA	US Department of Agriculture
VAT	Value Added Tax
VET	Vocational Education and Training
VFI	Vertical Fiscal Imbalance
VOC	Volatile Organic Compounds
WEF	World Economic Forum
WMD	Weapon of Mass Destruction
WTO	World Trade Organisation



# Project aims

Government has identified the 'opportunities and challenges of an economy in transition' as a key issue for Australia as it faces a rapidly changing global environment. In seeking to 'Secure Australia's Future', this multidisciplinary research project aimed to identify Australia's distinctive strengths and comparative advantages; establish which contexts and policy settings encourage creativity and innovation, adaptability and resilience; and explore the natural, geographical, economic, social, cultural, and scientific attributes and capabilities needed to thrive as a nation.



In commissioning this project in October 2012, the aims of the Office of the Chief Scientist were to address issues including, but not limited to: the characteristics of Australia's environment, biodiversity, location, cultural composition and other distinctive contexts that define the niches in which we can prosper in the global environment; what makes us unique and/or attractive as partners in R&D, industry and innovation; and the advantages we can build on that will assist us in positioning ourselves to enhance productivity, innovation, fairness and equity.



# Executive summary

## Introduction

Australia is both a lucky and successful nation, but neither luck nor past successes alone can guarantee the future we desire. There is always more to be done. Establishing proper policy foundations now, combined with public support and effective leadership will better place Australia on a trajectory for national strength, post the mining investment boom.

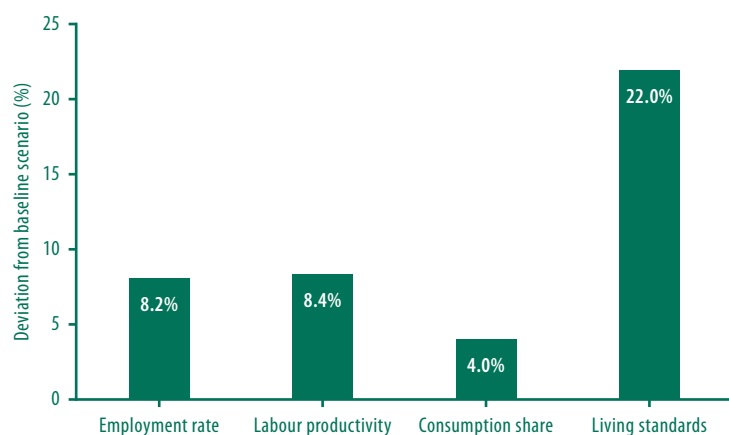
While reform is challenging, the benefits of systematic reform and investment in our future to build Australia's comparative advantage will mean higher living standards, increased equity and greater sustainability.

For instance, economic modelling for this project indicates that a new reform package across institutional change and future investment could add more than 20% to living standards by 2030 over and above trends that would be based on current policy settings only.



The modelling finds that without reform, living standards are likely to rise modestly, taking real annual consumption per head from \$36,000 today to \$45,000 in 2030. However, with a major reform package across investments and structural reforms, annual consumption per head is projected instead to rise to \$55,000, implying a reform dividend to living standards of \$10,000 per head. This reform dividend rises further by 2050, to over \$15,000 per head.

#### Potential gain in living standards from institutional reform and future investment for 2030



Source: Independent Economics 2015. Living standards is consumption per capita and is a compounded product of the sources of gain specified.

## Comparative advantage

The Australian Comparative Advantage (ACA) project has adopted a distinctively broad notion of comparative advantage. The pursuit of comparative advantage is seen here as how to best develop, enhance and use the nation's capabilities.

The project correspondingly maintains that comparative advantage need not be perceived as simply static or sectoral, but can be interpreted as foundational and dynamic—across the nation's politics, law, markets and culture.

Advantage can thus transcend physical endowment and create a base or further foundation that comprises cross-industry advantages, from which individual industries can then rise to establish their comparative advantage in domestic and international markets.

This report focuses on building comparative advantage by getting the basics right, and is a foundational rather than 'niches' approach. The emphasis is on securing the future through sound foundations. How this plays out and is enhanced in sectoral development can then be further analysed for the specific industries. Key sectors are analysed in this report, but for a comprehensive project such as this the emphasis has been upon basic settings and conditions that can have wide benefit across sectors.

The historical legacy and the natural endowments of the country are part of this and an important part, but comparative advantage can also be created for the future. This must encapsulate both strengths that could be enhanced, and weaknesses that should be mitigated, and is the dynamic element in the interpretation of comparative advantage adopted here.

## Valuing evidence

As an ACOLA project, this report is principally based upon well-documented evidence. As well as drawing on a general body of knowledge, and international comparisons, a series of studies were commissioned for this project that form the core of its deliberations and findings. In particular several major surveys and a modelling exercise gave original insight and these are available on the ACOLA website.

Other ACOLA reports, especially those in the *Securing Australia's Future* (SAF) series, were also drawn on for this particular ACA report. These are also available on the ACOLA website.

Wherever possible the report uses more than one of these sources too. Indeed 'triangulation' is a distinctive feature of the analysis. Multiple sources of analysis and types of evidence were firmly incorporated in the project's philosophy, drawing on approaches from across sciences and humanities. The project is an inter-disciplinary one.

The project takes the view that evidence-based policy helps reduce the differences between contending views and puts future action on a surer footing. It does not resolve all issues. Interpretations of evidence can differ and values will often compete in assessing the significance of findings. To enter the marketplace of ideas armed with systematic knowledge will provide a surer foundation for informed decisions.



## National strengths and weaknesses

Australia does not come to this task without existing strengths. International benchmarking reports and domestic surveys show that Australia's culture and society is fundamentally strong. In recent decades Australia has experienced one of the longer periods of sustained employment and income growth of any advanced country. Its basic institutions have been stable and issues of social equity and environmental sustainability have been of growing importance in national political discourse.

Australia has an abundance of natural resources, a high quality of living and some of the best cities in the world. Australia is strong in basic research and human development. Its education and skills are well regarded. Its systems of government, law and culture have provided a strong foundation over decades for growth, development and a fair society.

This report confirms Australia has many strengths, but emerging social, political, economic, and technical trends are undermining these. In relation to its strengths and weaknesses:

- Traditional sectors like mining and agriculture provide much promise and will remain areas of strengths. However, to realise this, Australia must move up the value chain, beyond the existing low value-added paradigm (for example, an extract and export model in mining), and new comparative advantage should be built in advanced manufacturing and advanced service sectors.
- Australia has a well-skilled and effective workforce which can be best further leveraged by linking into global production networks. A strong technical skills base is undermined by less well-regarded management skills and by policy uncertainty in vocational education and training (VET) settings. A balanced and multi-dimensional skills capability is essential if Australia is to realise the opportunities presented by the Asian Century.
- Australia has a strong and respected research capability, but it needs to improve its performance in the application of this research in industry settings.
- Quality of Australian government leadership, both as perceived within Australia and from overseas, and regardless of political affiliation of the leadership, is presently rated poorly. Furthermore, government regulations are now considered to be high, which stifles innovation and growth.
- A strong federal structure and rule of law has delivered lasting prosperity and quality of life, but current federal arrangements are characterised by perverse incentives and acute imbalance in resources and responsibilities between the Commonwealth and state and territory governments.
- Institutions in the areas of law, markets and culture are also significant for underpinning advance and have been strong in contributing to this. But important opportunities to strengthen these further do exist, including in areas such as intellectual property, the creative economy and in competition policy.
- An inclusive and cohesive society has allowed people to develop their productive potential, but global terrorism and the spread of violent ideologies is testing our distinctive cultural diversity, while the rise of internet and social media have increased the spread of violent and regressive ideologies. These need to be countered through more effective social and cultural integration.
- While rightly celebrated for its egalitarian culture, Australia is facing concern over worsening outcomes in terms of inequality and participation. Our national identity and the Australian way will demand this is addressed, and increased educational attainment and labour-force participation by women and Indigenous communities are amongst key priorities for achieving this.
- Australia's environmental performance in response to economic growth has been mixed, with some indicators improving

and others deteriorating. Environmental sustainability is an essential prerequisite for lasting prosperity and wellbeing. Global benchmarking shows that Australia has done especially well in terms of its water management, which can provide important lessons for other areas.

- Robust policy development must be based on a rigorous evaluation of ideas and evidence, and on multiple perspectives and contributions from academia, and the policy, business and community sectors. However, current mechanisms for such collaboration are weak in Australia and need to be strengthened.

These capacities will play out in a changing pattern of opportunities and threats. Key elements identified for this report are presented below.

## Opportunities

- An increasingly diverse Australian population with extensive links throughout the region and beyond could be leveraged to create global businesses linkages, especially now in Asia.
- Some of the world's most liveable cities, if managed well, could better utilise the impressive domestic talent and attract the best from overseas.
- In a world of strategic uncertainty and rapid change, Australia could help to set the narrative and influence the agenda for global standards and regulations, and particularly in its region. If handled well, these would play to Australia's strengths and allow it to compete more effectively on a global stage.
- Value-added enhancements through innovation combined with linkages into global production networks could create new opportunities and employment in mining, agriculture, advanced manufacturing, and other sectors.
- Development of advanced technologies could help to alleviate resource constraints in an increasingly interconnected and populous world that values sustainability and security.
- Climate change and pandemics are two great disrupters. To those managing and attempting to mitigate them, they can also present opportunities. Appropriate investments in science and medical research and supporting policies, for effective commercialisation, will pay off. Australia does have an opportunity to be a global leader in innovation for adaptation to climate change.

## Threats

- Australia's skills profile could easily be locked into the low value-added end of the skills spectrum. University and vocational education funding support might fall behind global standards. The immigration framework could focus too much on shorter-term needs than longer-term national benefit.
- A largely resource-dependent economy would fail to diversify, and a potential slowdown in China could expose the Australian economy to prolonged recession.
- Economic deprivation and social alienation within Australia could compromise participation in employment and improvements in productivity, and further increase the attractiveness of violent and terrorist ideologies, particularly in minorities and immigrant communities. This is already evident in many advanced countries, and has tested the liberal democratic foundations of societies there.
- Climate change and rise of ocean water levels could create significant threats for Australia, since all of its major commercial cities are in coastal areas.
- Perceptions of extreme income inequalities within and across some nations could lead to social tensions, undermine public support for globalisation, and unravel global economic institutions. This would not only adversely affect global trade, but also the basis of wider transnational relations.
- Continued national prosperity and wellbeing would be destabilised by an absence of effective political leadership and disciplined

and rigorous contestation of ideas and evidence. This is most likely to happen if linkages and collaboration between academia, policy, community and business sectors remain underdeveloped.

## The path to the future

In light of these strengths and weaknesses, opportunities and threats, and looking ahead, Australia will need to strengthen and utilise all its areas of comparative advantage. The key to this is getting the fundamentals right. This means building a solid foundation from which to make the most of an unknown future and a range of possible scenarios reflecting that uncertainty and complexity.

This Australian Council of Learned Academies (ACOLA) report has looked to how comparative advantage can be sustained and developed to help condition the future in light of the global trends, challenges and uncertainties.

To sustain and improve performance, the project has concluded that a new reform process is essential. The project sees these reforms as providing the foundations for a future that should be prosperous, fair and free for Australians.

Such reform would require two key components: ongoing structural reform, and new investment for the future. Structural or institutional reform is well known and well advocated, but can be revitalised in a number of ways. However this report has found that discussion of the need for a further complementary strategy that involves renewed and reinvigorated investment in the nation's future is less well developed and much more piecemeal. It is argued in this report that such investment needs more focus and emphasis, but that equally the pursuit of both institutional and investment approaches together would be the most beneficial path to securing our future; indeed elements of the two categories overlap.

This report has found there has often been a disconnected approach to identifying areas in need of review and reform. Some areas have been studied on numerous occasions and some a little or not at all. A broader approach

to the reform task is needed to help deliver the foundations necessary to improve comparative advantage. Indeed the foundations themselves should be seen as the principal objects of seeking and building comparative advantage.

This report argues it is the full spectrum of structural reform and investment in future capability that will best build Australia's future comparative advantage.

The report therefore concludes that a package embracing both institutional reform and national investment should be given close attention as providing joint foundations for a strong future for the nation. Institutions such as federalism, intellectual property laws and competition policy have been sources of strength in the past but are failing to adapt to a changing strategic environment and could be reformed in order to align to the new century's imperatives to keep serving the national interest. Taxation, spending and regulation reform have also been identified as areas for continual improvement in a range of studies and surveys considered and conducted for this project. Global engagement and soft linkages will also be crucial as will the construction of immigration to ensure it contributes well to the nation's future.

Complementing the institutional reform should be actual investment in the key areas that underpin capability—the capacity to compete and deliver for the nation's future. This includes investment in education, training and skills, and in innovation, since the capacities of the people of the nation are the true core of advantage. This must be complemented by appropriate investment in public infrastructure to ensure the facilities are there for effective private activity to operate, and by ensuring full work participation by the Australian population.

Defining exactly what reforms produce what benefits is, of course, contested terrain. Resolution requires good evidence of the benefits and costs. Such evidence informs the modelling of reform conducted for the project. Importantly this is transparent and documented, so that alternative assumptions or improved evidence can be tested too, as can further policy changes beyond those examined here.

## Implications of economic growth for social equity: Rand Corporation

### *Addressing inequality*

#### **Education**

Expanding and improving the quality of education from early childhood to the tertiary level will further economic growth and promote equality. There are very high social returns from early education programs, and tertiary education has a very high pay-off in Australia. Investing in quality, expanding the number of institutions, and raising the minimum school leaving age are all likely to have positive impacts on economic growth and equality.

#### **Fiscal policy**

Fiscal policy can even out disparities and make growth benefit all income groups where economic and social forces enlarge inequality. An existing system of progressive transfers and taxes has been a source of advantage for Australia, but it could be further enhanced and increasing targeted social expenditure could reduce inequality that emerges in the future.

In the process of 'walking on two legs' in this way, through structural reform and capability investment, the ACA project has identified a number of key factors of importance as dimensions or drivers of this process. They are summarised as follows:

### **Natural advantage remains important**

Sectors based on Australia's natural endowments such as agriculture and mining, including fisheries, forestry, and oil and gas, will certainly have the ongoing potential to grow and will benefit from major cross-sectoral reform. Australia is the sixth largest country on Earth by total area, and as such numerous advantages have been endowed by nature. These range from mineral resources to climate and fauna/flora. It has a wide variety of landscapes, with tropical rainforests in the north-east, mountain ranges in the south-east, south-west and east, and dry desert in the centre. The Great Barrier Reef, which is the world's largest reef, extends for over 2000 km.

While Australia's population density is amongst the lowest in the world, most of the population lives in the temperate coastal cities. It possesses a diverse range of habitats and is recognised as a mega-diverse country with a significant share of global geological and geographical assets, particularly relative to population.

However sectors that have been traditional sources of strength and prosperity are facing constraints that transcend narrow sectoral boundaries. While Australia cannot be good at

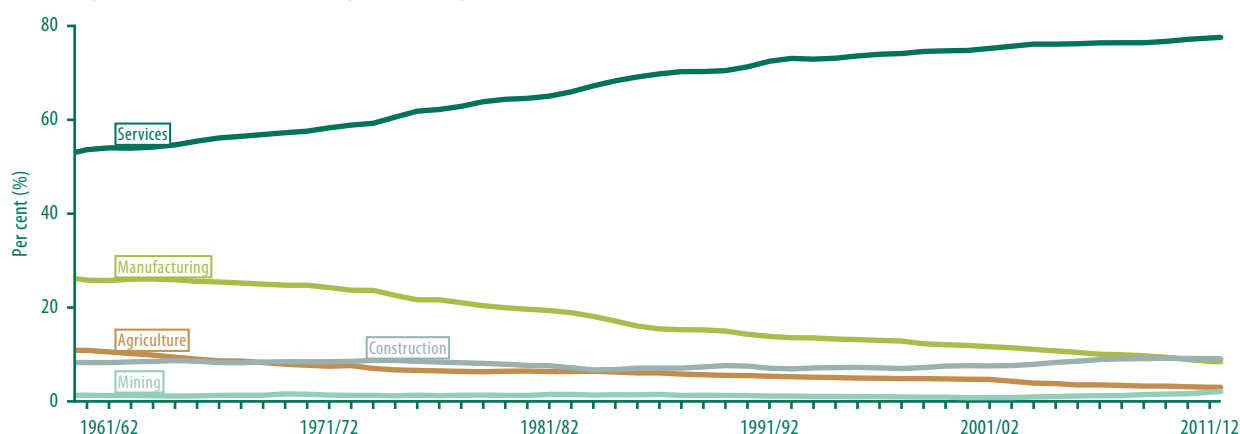
everything, concentrating on the lower value-added components of the value chain especially is not a viable strategy for the future, particularly in an age of global value linkages and product fragmentation which values functions (specific elements of the value chain) rather than sectors (or industries). Enhancing our contribution to the high-value elements of the chain will ensure better flow-on benefits to Australians including for advanced manufacturing.

### **Created advantage offers new potential**

The report also finds that while the services sectors employ most Australians, they are a less well-recognised source of potential which should be better tapped to extend benefits to more Australians. Great gains can emerge from created advantage based on the skills of Australians in these fields. Areas such as health and education and professional services are capable of much future development, as is seen in detail in the studies completed for the project.

The strength of past employment growth in Australia in the services sector is seen further in the figure that follows which demonstrates the potential to tap this distinctive feature of the long-term evolution of the Australian economy. The challenge for such growth will be accommodating automation-driven productivity improvements without reducing employment. The historical record is that this can be done, especially as demand shifts to these services as average incomes grow.

## Employment in Australia by industry, share of total\*, 1961–62 to 2011–12



\*Estimate for 2011/12.

Source: Woyzbun, Beitz & Barnes 2014.

The report concludes that all sectors can build on Australia's history as a stable, urban, equitable and culturally diverse society.

### Knowledge and ideas really matter

The report emphasises that all sectors of the Australian economy, society and environment can substantially benefit from a firm foundation of excellence in the nation's intellectual and skill capital complemented by a culture of knowledge transfer. For an advanced industrial economy such as Australia facing structural transition and a range of national and global challenges, the report is clear that in the long-run, knowledge ideas and their application are the real key to creation of sustainable comparative advantage.

While Australia has been considered an innovative nation in many ways, reform is needed to ensure that the national capacity for utilising that innovation is increased. In order to remain a competitive and prosperous nation, the understanding of innovation needs to be broadened from a focus on research and development to one that encompasses both non-scientific innovations as well as the application of appropriate new research.

While Australia has a workforce whose skills are widely and internationally respected, it must be able to operate in an environment of global integration of trade and fragmentation of production. Furthermore there are some

concerns that the Australian education system may not be fully imparting the skills required for a competitive knowledge economy. A multi-dimensional approach is needed where STEM (science, technology, engineering and mathematics) skills are built strongly, but are properly complemented by capability in areas such as humanities and social sciences (HASS) in order to understand the culture and societies in which Australia seeks to operate or engage.

Ideas and the sharing of information is also an area this report finds is underdeveloped. In surveys undertaken for the ACA project, the cooperation between industry and universities has been found to be inadequate. There are also fewer institutions or think tanks to enable the fostering and exchange of ideas outside of government than in other similar nations such as the US, UK or Northern Europe.

### Better leadership is important

There is an ongoing need for Australia to have strong leadership and to move to new best practice management in all areas. The project has identified a concern particularly amongst industry and bureaucrats surveyed for the study about the quality of both business managers and political leaders. The performance of electoral representatives was seen as falling, with doubts about whether the current political system can adequately foster the progress sought.

## Surveys of CEDA & IPAA members for ACA project

### *Knowledge & Leadership Issues*

#### **Knowledge transfer and technological cooperation between universities and companies.**

Only a minority of industry respondents (15%) and public service respondents (24%) believed that cooperation is well developed.

#### **Education system**

Only a minority of Industry (29%) and public servants (32%) believed that the education system is imparting the skills needed for a competitive, knowledge economy

#### **Leadership & management**

Industry respondents largely rated the quality of management across industries as average and public servants across all agencies surveyed believed the trend for performance of elected representatives was falling even when the current performance was rated as good.

#### **Political system fosters progress**

Only a minority in both industry (11%) and the public service (23%) agreed the political system presently fosters progress.

Source: Kumar 2013a; Kumar 2014.

Effective progress would involve the potential of technological advancements like big data and cloud computing to be tapped, and include public, private and community sector management. The emphasis would need to be on learning about best practice and tapping the facilitating role of the Australian business schools, industry associations and leading consultancies to provide a concerted opt-in educative push on the use of such advancements as well as providing for a quantum leap in management skills. The special character of entrepreneurship should be added to this formula.

### **Strengthening the role of partnership is important**

There is an evident need for the development of strengthened and new institutions and incentives for collaboration and partnership between governments, business and community. The benchmarking and national reports compendia compiled for the project show Australia has developed a distinctive and largely successful model of public-private partnership that

represents the Australian way in basic spheres of social and economic provision. This ranges from education, health, and infrastructure, to child-care, retirement, social welfare provision and more. This can be enhanced and strengthened however, as some areas are not yet as strong in this approach as others.

The project finds that new public-private partnerships in knowledge creation and commercialisation and in environmental initiatives could particularly be considered, as the current arrangements do not seem to be working so well. Indeed there is a range of possible specific policy developments from the structure of university and other research funding, through the role of industry associations and to new R&D financing packages for SMEs.

Greater use of Australia's pioneering income contingent loans could complement such partnerships well as a distinctive Australian response to these specific needs and, even more fundamentally, to the wider issue of what is sometimes called the 'fiscal crisis of the state'.

## Pay-offs from reform

Modelling for this project has found that addressing reform in a broad way would have valuable and sustained benefits for the Australian economy and its people. This would mean both:

- institutional reforms in political, legal and market institutions ranging from federalism, through intellectual property to trade, taxation, workplace relations and competition policy, and also
- investments in infrastructure, education, research and development, innovation, labour participation and immigration.

The modelling analysis is from well-attested techniques also used by the Parliamentary Budget Office, Productivity Commission and others.

While either of the two paths, institutions or investment, would be valuable, the power of the two together, creating comparative advantage by 'walking on two legs' is especially impressive. There is the potential for increases in living standards of 22% within 15 years, over baseline trend.

Under the combined scenarios, manufacturing would get the greatest benefit with agriculture also predicted to grow strongly. Demand for manufactured goods is boosted by the high rate of infrastructure investment required to support a higher rate of economic growth and agriculture benefits from the boost from free trade agreements.

The modelling also postulates double-digit rises in employment and there are gains in

after-tax wages of an average of 21.5% by 2050. The biggest gains are for low-skilled workers with a predicted increase in after-tax wages of 38.1% compared to increases for mid-skilled workers of 20.9% and high-skilled workers of 13.1%. This is a striking outcome for the objective of the pursuit of growth with equity, and arises from the shift in demand matching the growth in supply. The migration and education reforms both increase the supply of high skilled workers relative to low skilled workers, leading to some narrowing of wage differentials.

While the policy and reform process is never without challenges, a survey of public attitudes conducted for this project shows there is an appetite for at least some level of policy change. This includes a desire for more spending on core drivers of comparative advantage such as education at the school and tertiary level, and transport and communications infrastructure. Respondents were also very open to other investment change and to some institutional changes, particularly in labour market flexibility and pro-competition reforms.

While there was less support for taxation structural change, there was very clearly a willingness on the part of those members of the public surveyed to contribute to the wider cost of institutional reform through a higher level of taxation. A clear majority of those surveyed would either be willing to pay a little bit more or pay what was required to get the changes they nominated as important.

### Willingness to pay more for institutional reform and capability investment, by demographics (%)

Response	Age group			Education		
	18–34	35–54	55+	Up to Y12	TAFE	University
Be willing to pay whatever was required	24	22	17	17	17	24
Be willing to pay a little more	53	55	61	53	54	59
NOT be willing to pay more	23	23	23	29	29	17

Source: Table 5.5.



## Conclusion

When considering what the future may bring, this report has found that thinking that tomorrow will be more of the same as today is not good enough. All possibilities need to be contemplated. In choosing how we face that unknown, and in some cases, unknowable future, a broad approach is necessary to make sure that the foundations with which we will face the new challenges are enhanced for whatever may come.

Australian progress faces challenges of great importance, but these are challenges that this project finds can be met. In the view of this report, building comparative advantage will require a commitment to ongoing institutional reform and to investing in our future capabilities as a nation. The report outlines packages of policies that are illustrative of what is required.

Natural advantage sectors will still contribute mightily, but they can usefully be matched by the equally promising created advantage in the traditional areas of economic advantage and emerging advantage opportunities in advanced manufacturing and service industries.

The report also concludes that institutions and culture must be configured to support this process, including through Australia's rather distinctive deployment of major public-private partnership systems, and that better leadership, management and the encouragement of innovation and entrepreneurship will be a key to

success. In all the above-mentioned illustrations the importance and centrality of knowledge/ ideas would be explicitly recognised in the associated structures and policies.

The project has found evidence that the Australian public is increasingly willing to commit to and support such ways forward. Explanation and leadership is needed for this vision to realise its potential, but the Australian community has the level of sophistication to understand what is needed to inform and support that process.

Building comparative advantage is not simply addressing a list of policies or proposals but ensuring the framework of a broad-based foundational approach to the Australia of the future is understood and at the heart of decision-making and debate. Australia does well at many things but that is no guarantee of future success. If we want the country to be the best it can be, we will have to build that future.

This report affirms that pursuing both institutional changes in political, legal, market and cultural arrangements alongside investment in skills, infrastructure and innovation would see long-lasting benefits to growth and living standards. These initiatives would develop the national capacity to realise comparative advantage and compete well in a changing global environment. They would also enhance our ability to do this equitably and sustainably.





*While reform is  
challenging, the benefits  
of systematic reform  
and investment in our  
future to build Australia's  
comparative advantage  
will mean higher living  
standards, increased  
equity and greater  
sustainability.*



# Key findings

## Comparative advantage (Chapter 1)

- A broad definition of comparative advantage allows for a more holistic and inclusive view of what is needed to build and consolidate Australian strengths across the nation's economic, institutional, social and cultural arrangements.

## Taking stock, looking ahead (Chapter 2)

- Australia has many notable strengths, particularly in its high quality of living (especially in the large cities), low corruption, strong basic research, and high human development. However, there is insufficient policy attention given to how to maintain and enhance these strengths, or what emerging challenges could undermine these in the next few decades. There also appears to be little attention given to what lessons could be drawn or how their success could be emulated in other areas. Commissioned reports have too often been narrow and piecemeal and the reasons for and lessons from areas that are Australia's strengths appear not to have been the subject of in-depth study. For example, why Australia's culture is rated so highly and what makes its cities good places to live, perhaps, are not adequately examined.



- Benchmarking shows there are weaknesses in some of the drivers of comparative advantage such as the commercialisation of innovation, education equity, infrastructure development, environmental sustainability and government regulation. Public leadership is perceived as lacking by business and policy sectors, as well as foreign business executives who deal with Australian companies. These are significant areas where much improvement is needed. The awareness of global or other country directions is weaker than might be expected in government/public service.
- The project's survey results show that the government and business sectors naturally attach importance to issues relating to their immediate direct interests, and do not attach importance to other trends and developments, as a result their perspectives diverge. This makes consensus in policy a challenge. Greater partnership and collaboration might be sought so that outcomes are based on mutual understanding if not full convergence.
- Australia will face a challenging and complex global environment with strong global competition in some of Australia's strongest industry sectors. Considerable uncertainty exists, as shown by the project's scenario analysis. The strategic landscape in the 21st century will be characterised by complexity and diffusion of power. Policy should aim

for robustness and flexibility, resilience and nimbleness. Assumptions of certainty will breed rigidity. Power and responsibilities will have to be better divided, and resources and skills will need to be adequately provided such that each level of government can handle its particular problems.

## Core policy themes (Chapters 3 and 4)

- Industry policy that relies upon past strengths only will not yield the desired results unless complemented with new ones. This is due to realities of both globalisation and the revolution in information technologies as well as other key enabling technologies.
- Australia's stock of natural resources and global reputation of its skilled work force are national strengths. This can and should continue to be the case. However, the Australian market size is limited, and continuing growth requires that global markets are targeted and opportunities realised intelligently.
- The current prosperity has been in part the result of focusing on some lower value adding elements of the value chain, whether in terms of extracting and exporting minerals and ores, or growing and exporting basic agricultural commodities. This cannot be a viable strategy for the longer-term future. The nation does not yet adequately focus on adding value to these economic activities, even though that is what we should expect from a highly developed nation with a skill-intensive workforce. Most of global production is now based on global value chains and global production fragmentation, where even a single product from a single industry is assembled from parts produced all over the world. This applies to products ranging from commercial aircraft (Boeing) and children's toys (Barbie dolls). Countries specialise, not in industries, but in specific elements of the value chains and Australia needs to access the high value components.
- Both macro and sectoral analyses shows that, in building comparative advantage, Australia needs to have world-class infrastructure, not just in physical terms (roads, ports, utilities, etc.) but also digital infrastructure that supports large data transfers and high speeds. Historical investments in infrastructure made Australia one of the most urban countries, and delivered one of the highest living standards in the world. However, as things currently stand, Australia ranks as a 'middle performer' on infrastructure amongst the cohort of advanced nations. Given a projected 40% increase in population over the next 20 years, a failure to upgrade and invest in new infrastructure could seriously undermine long-term national comparative advantage.
- If Australia is to seriously leverage its national strengths to gain from participation in global networks and fully support domestic realisation of advantage, then it will need to further develop its skills. A nation is defined by its people, and a nation's productive capacity is centrally dependent on the skills capability of those people. Australia has a work force whose skills capability is substantially respected. In order to remain so, it must be able to operate and add value in an environment characterised by high levels of global integration of trade and fragmentation of production. The rise of Asia and the economic power of its middle class create new challenges and opportunities. Among other things, these challenges and opportunities require a multi-dimensional skills capability, where a strong STEM capability is complemented by capability in both management and humanities and social sciences (HASS). Australia also has a strong VET sector that can be even better positioned and utilised.
- Immigration has been a major source of skills enhancement for Australia and, with around 25% of its current population being overseas-born, is also a defining feature of Australian development. Australia is widely viewed as more successful than most countries in how it has operated its migration entry and

settlement arrangements. As such, well-managed immigration should be an ongoing source of comparative advantage for the nation, and should be reviewed in order to ensure continuing optimal performance.

- Amidst a spreading rhetoric of needing greater innovation, inadequate attention appears to be paid to national capacity for utilisation of that innovation. As things currently stand, this capacity is too limited. Clearly for Australia to improve its competitiveness and productivity capability, this must improve. A more effective taxation and legal system that incentivises innovation and risk taking will be part of the solution. So will improved innovation finance arrangements, potentially including new approaches such as revenue contingent loans for R&D. It may also be that Australia could lead in adopting a broader definition of innovation in its policies and behaviours so as to encompass non-scientific innovation too.

## Wider positioning for Australia's future (Chapter 4)

- Well-functioning institutions need to be seen as a key part of securing comparative advantage. It is institutions which set the rules of engagement and affect the incentives and understandings facing society and economy. Institutions are of many kinds, though the ones looked at in this report govern how powers and responsibilities are shared between the various levels of government (federalism), how knowledge creation is regulated and rewarded (intellectual property), how businesses compete in a modern capitalist society (competition policy) and how culture facilitates understandings (cultural policy). While each of these have been real sources of strength in the past, they are failing to adapt to a changing strategic environment, and must be realigned to 21st century imperatives if they are to keep serving the national interest. Actions to improve

functioning of policy in each of these areas will contribute substantially to enhancing comparative advantage and national well-being.

- Enhancing national well-being through comparative advantage also requires recognition that socio-cultural and environmental dimensions are part of the framework required. While both must be made resilient to changing circumstances, our collective national response to these circumstances should also avoid causing irreversible damage to the society and environment. Our quality of life and environment are great legacies we have inherited from past generations, and should take care that our collective stewardship of these delivers similar benefits for those who come after us.
- A cohesive and peaceful society—based on the principles of fairness, freedom, and opportunities for advancement—is the very basis of a functioning and productive society. It is self-evident that a society with endemic inequality or the fear of violence or exclusion and disadvantage is unlikely to fully realise its capacity to foster creativity, productivity, or dynamism. Australia has long enjoyed one of the higher standards of living in the world, and this has been based on social cohesion, rule of law, and a culture of 'fair go'. Important challenges to this need careful address, and this will support comparative advantage.
- Empirical analysis done for this report has shown a pattern of deterioration in several key environmental variables such as carcinogenic air pollution and wastes, which is only partially offset by adoption of better technologies, government policies, and transition to service industries. More work needs to be done to address the environmental impacts of growth. Water management is an area of particularly strong and positive performance, and could offer valuable insights and policy lessons that could be emulated across other indicators as well.

## Leading the way (Chapter 5)

- Comprehensive microeconomic reforms of the 1980s and 1990s have been credited with delivering lasting income and employment growth for Australia. However, previous reforms were incomplete, and changing circumstances and imperatives create new opportunities for growth through additional reforms. At the same time, opportunities also exist for policies directed at investment in Australia's future.
- Policy advance can embrace measures that improve both institutional capability and measures that advance future investment. The latter has received less comprehensive public attention than did institutional or structural reform. Modelling for the report shows that concentrating on boosting investment will have longer lasting economic benefits than institutional policy changes, but the pay-offs to these can also be high. Combining the two in across-the-board reform is therefore the optimal path.
- The aggregate pay-off for a combined package of widely recognised reforms could be of the order of 22% for living standards by 2030 over and above the baseline trend without such reform. The wage benefit to less advantaged workers is higher than that for average workers under the reform scenario. This projected equity advance is also important to acknowledge.
- All sectors would advance in aggregate under reform relative to the base case. But manufacturing and agriculture would especially benefit.
- Public support for policy change will be harder in some areas ahead of others. Some structural policy reforms in particular may therefore require more work to convince the public of the necessity for change, according to the survey of public attitudes conducted for the project. Leadership is an essential ingredient for success here.
- People are willing to contribute at least a little more in taxes to fund the costs of reform, again according to the project's survey of public attitudes.
- There is a need to clarify the roles and responsibilities in the federal system. Confidence could be built with the transparent evaluation of government spending projects of a substantial size.
- Effective action across all the defined 'bedrock' areas would require effective and forward-looking leadership that articulates a vision based on a rigorous contestation of ideas, achieves public support by communicating the potential benefits of these to the public, and takes adequate account of public feedback and priorities, as seen in past accounts of policy reform successes and failures.
- Leadership skills need to be lifted at the management level. Leadership in ideas could also be built through enhancing Australia's portfolio of think tanks and like entities well beyond present levels. Universities could have impact and engagement strategies as part of responsibilities.
- Australia has a unique blend of public and private in the provision of economic and social spheres and this could be built on as a basis from ongoing national stability and advance. Income contingent loans could be increasingly applied in many more areas as a distinctive Australian way forward that can assist with the task of 'fiscal consolidation'.



*Establishing proper  
policy foundations now,  
combined with public  
support and effective  
leadership will better  
place Australia on a  
trajectory for national  
strength, post the mining  
investment boom.*





# Introduction: advancing Australia

What sort of Australia will we live in? What changes will the increasingly complex world bring to our lives and our work? How will we meet those challenges? Can we do more of the same or do we need to do some things differently? How do we keep the things that make Australia strong in the face of those challenges? How do we address our weaknesses?

Australia's Comparative Advantage (ACA) project seeks to answer those and related questions through exploring how to build and secure Australia's future through comparative advantage.

With an economy in transition in an increasingly complex and competitive world, the project aims to provide a national roadmap for decisions about the future and the conditions that can underpin achieving Australia's best.

Using evidence-based analysis and multiple methodologies of investigation, the nature of future economic transition, and also social change and environmental adjustment, have been reviewed and examined. This is a 'triple bottom line' or 'wellbeing' approach.

Australia's distinctive attributes have been defined as the foundation for a country that can deliver more than most on freedom, prosperity, fairness and sustainability. But how can continued national wellbeing over the remainder of the century be ensured? What possibilities and opportunities should be pursued? What emerging challenges threaten or undermine those strengths?





These are fundamental questions that have been pursued by the ACA project as part of the *Securing Australia's Future* (SAF) program of investigation through the Australian Council of Learned Academies (ACOLA).

This is a series of strategic research programs delivered to the Australian Chief Scientist and the Commonwealth Science and Innovation Council. It is coordinated by ACOLA where the Academies are working together to deliver research-based evidence to support policy development in areas of importance to Australia's future (Figure 1.1).

**Figure 1.1: *Securing Australia's Future* research topics**

- |  |   |
|--|---|
| 1. Australia's comparative advantage   | 7. Australia's agricultural future  |
| 2. STEM: Country comparisons   | 8. Sustainable urban mobility   |
| 3. Smart engagement with Asia:<br>Leveraging language, research and culture                              | 9. Translating research for economic and social<br>benefit—country comparisons      |
| 4. The role of science, research and technology<br>in lifting Australian productivity                    | 10. Capabilities for Australian enterprise innovation                               |
| 5. New technologies and their role in our security,<br>cultural, democratic, social and economic systems | 11. Business diasporas in Australia: maximising<br>people to people links with Asia |
| 6. Engineering energy:<br>unconventional gas production  | 12. <i>Securing Australia's Future</i> program review                               |
|  | 13. Research training system review   |

The project has used research approaches drawn from across the range of academic disciplines to help address the fundamental issues involved in positioning Australia for its future. It is focused on the medium and the long-term but also on the pathways that need to be built to that future from the present.

## 1.1 The nature of comparative advantage

The notion of comparative advantage is both a complex and contested one.

For this project, comparative advantage has been defined broadly as creating and playing to Australia's strengths, and of ensuring flexibility and resilience in the pursuit of this ambition. It is the high road to sustained advantage for Australia: the realisation of long-term potential and the general direction and policy options for helping realise that potential.

It is not simply competitive advantage. While that is one source of comparative advantage, it also involves maximising national benefit from all contributing factors. The approach therefore goes beyond the market position of firms, though this remains central, and embraces political, social and cultural factors as influencers too.

The project assumes wellbeing can only be fully achieved if Australia commits to strongly engage in the global marketplace and wider international activities in the Asian century, but also embraces the non-traded sectors from construction to services to local manufacturing. The same principles apply to internal trade so the non-traded sectors contribute not only indirectly to international trade capability but directly to national wellbeing.

It is not just a notion that applies to economic activities alone. Comparative advantage transcends specific industries and can arise as much or more from the institutional, social and cultural arrangements that underpin a country. This is an important theme for this report. An effective education system, sound legal and cultural institutions, progressive property rights and regulatory regimes, and an inclusive and peaceable society are all important enabling factors and drivers of sustained national prosperity.

Building on the sources of national strength that cannot be easily replicated or competed away and which are, by design or default, sustainable, is also central. Legacy and natural endowments are therefore part of comparative advantage, but created advantage is as well. And the strengths of both need to be encapsulated and weakness mitigated.

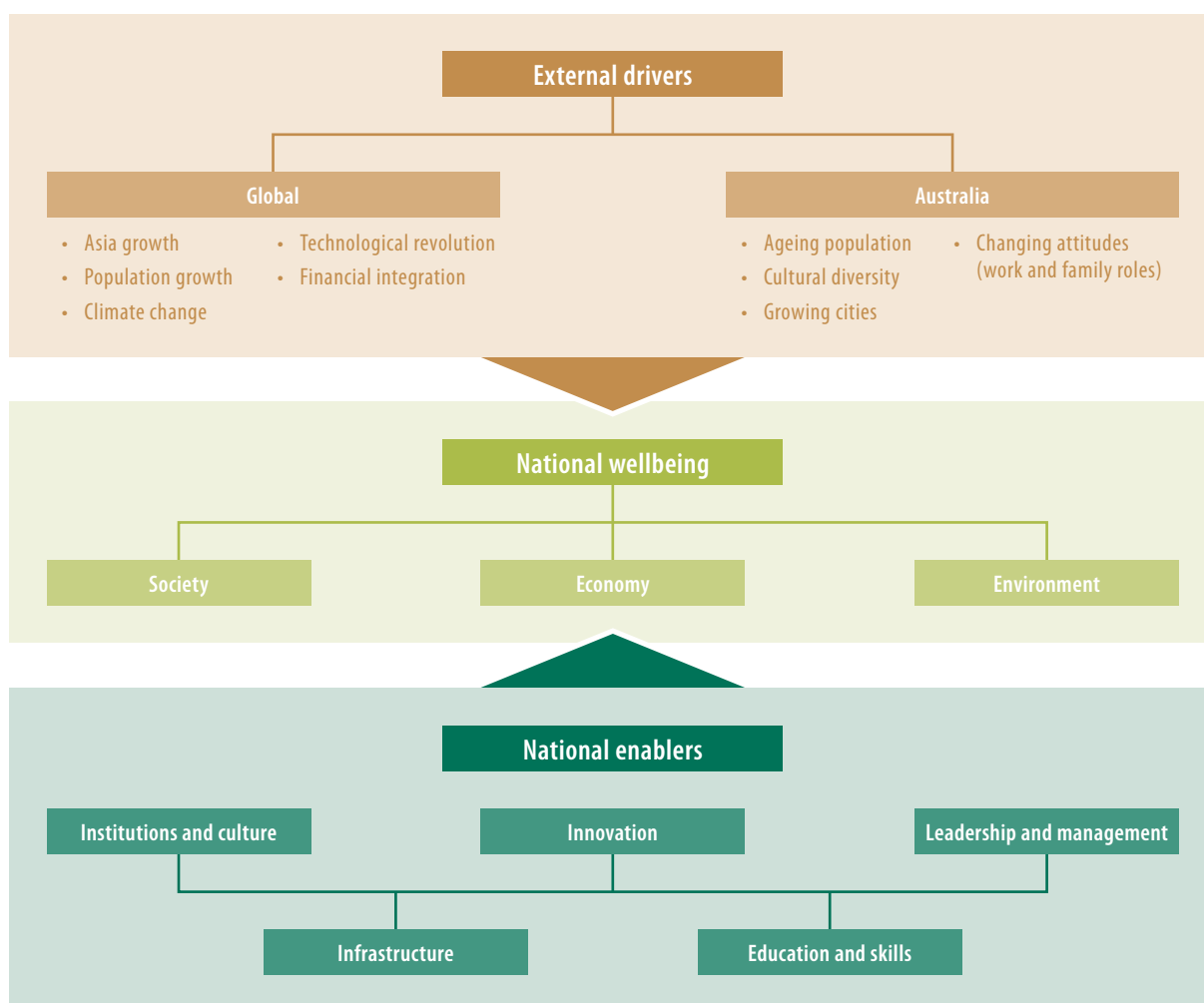
Australia has become a more flexible and resilient nation through the policy settings and actions over the past few decades. But it can also be argued that insufficient sustained attention has been given to further new sources of national strengths or advantages, or to understanding of how emerging global trends and socio-cultural changes are creating new opportunities and threats for Australia. The project therefore embraces a foundational notion of comparative advantage that can be created as well as incorporating natural advantage and facilitating sectoral comparative advantage.

## 1.2 A framework for analysis

This approach to building Australia's comparative advantage leads to a wider framework for examining the determinants of this and their enhancement. A 'drivers' and 'enablers' characterisation helps here. The drivers are the forces conditioning the opportunities and threats facing Australia. The enablers are our capacities for response. A 'triple bottom-line' evaluation of their impacts is adopted.

It is evident from this approach that comparative advantage is wider than competitive advantage alone, with the latter's connotation of market position of firms as the only or predominant focus. Here further social, political and cultural forces are also seen as influencers (Figure 1.2).

Figure 1.2: ACA's drivers and enablers framework for analysis



## 1.3 Project documentation

### 1.3.1 Valuing evidence

As an ACOLA project, this report is principally based upon well-documented evidence. As well as drawing on the general body of knowledge and other ACOLA reports, the project itself commissioned a series of studies that are at the core of the deliberations and findings of this study.

The project takes the view that evidence-based policy helps reduce the differences between contending views and puts future action on a surer footing. It does not resolve all issues. Interpretations of evidence can differ and values will often contend in assessing the significance of findings. But to enter the market place of ideas armed with systematic knowledge is to provide a surer foundation for informed discussion.

The ACA project itself wrote or commissioned seventeen reports as resources for this Final Report from the project. This is important as the project covers a huge canvas but needs to be sure on detail as well as big picture issues.

Of help here has been the ongoing work and final reports of the other *Securing Australia's*

*Future* projects. But the ACA project did develop its own detailed documentation, so that propositions and evidence provided can be interrogated further as required. Figure 1.3 lists the ACA project's own reports. These are all to be made available separately and provide the detailed documentation for much of the material summarised in this project's final report.

In addition, a range of statistical analysis used during the ACA project has been gathered and documented in Elnasri (2015), *Commissioned Statistical Studies for Australia's Comparative Advantage Project* which is provided alongside the other ACA reports specified.

Further to this end Figure 1.4 provides a mapping from the ACA final report structure to the project documents that were principally relied upon for the content of each section. These seventeen reports are listed, plus a report from the Committee for Economic Development of Australia (CEDA) which was also used extensively for manufacturing analysis.

The reports produced for this study to provide project-specific documented evidence are listed in Figure 1.3.

**Figure 1.3: Australia's comparative advantage reports**

ACIL Allen Consulting, *Australia's Comparative Advantage in Agriculture*

ACIL Allen Consulting, *Australia's Comparative Advantage in Services*

CEDA, *Survey of CEDA Members for ACOLA Project*

Eventures Australia, *Doing Business with Australia and Australian Organisations: A Global Perspective on Australia's Innovation and Entrepreneurship Capability*

Independent Economics, *Australia's Comparative Advantage: Scenario Modelling*

IPAA, *Survey of IPAA Members for ACOLA Project*

Justin O'Connor & Mark Gibson, Monash University, *Culture, Creativity, Cultural Economy: A Review*

PwC, *Maintaining Australia's Advantage: Institutions and Innovation*

PwC, *Maintaining Australia's Advantage: Management and Skills*

PwC, *Maintaining Australia's Mining Advantage*

Rand Corporation (Australia), *Implications of Australian Economic Growth for Environmental Sustainability*

Rand Corporation (Australia), *Implications of Australian Economic Growth for Social Equity*

SAF01, *Compendium of Global Ranking Reports*

SAF01, *Compendium of National Reports for Australia's Comparative Advantage*

Social Research Centre, *Australia's Comparative Advantage: Public Preference Study*

Centre for Australian Foresight, *Vision Australia, A Stocktake of Future Scenario Reports for Australia*

Vulture Street, *Ideas Jam Challenge: Report*

**Figure 1.4: Report mapping—principal project documents**

**1. Introduction: advancing Australia**

**2. Taking stock, looking ahead**

- Relative Global Performance (*Compendium of Global Ranking Reports*)
- Current Priorities and Focus (*Compendium of National Reports for Australia's Comparative Advantage*)
- Comparative Perspectives of Stakeholders (Vulture Street, *Ideas Jam Challenge: Report*)
- Plausible Scenarios for the Future—Trends, Issues, Drivers, and Enablers (Centre for Australian Foresight, *Vision Australia, A Stocktake of Future Scenario Reports for Australia*)

**3. Sectoral dimensions of Australian performance**

- Agriculture (ACIL Allen Consulting, *Australia's Comparative Advantage in Agriculture*)
- Mining (PwC, *Maintaining Australia's Mining Advantage*)
- Manufacturing (CEDA, *Advanced Manufacturing*)
- Services (ACIL Allen Consulting, *Australia's Comparative Advantage in Services*)
- SAF04, *The Role of Science, Research and Technology in Lifting Australian Productivity*

**4. The bedrock: foundations of a free, fair and prosperous society**

- The Role of Institutions (PwC, *Maintaining Australia's Advantage: Institutions and Innovation*)
- Embedding Innovation (PwC, *Maintaining Australia's Advantage: Management and Skills*; Justin O'Connor and Mark Gibson, Monash University, *Culture, Creativity, Cultural Economy: A Review*)
- Developing Skills (PwC, *Maintaining Australia's Advantage: Management and Skills*; Justin O'Connor and Mark Gibson, Monash University, *Culture, Creativity, Cultural Economy: A Review*)
- Fostering a Harmonious Society (Rand Corporation (Australia), *Australia's Comparative Advantage: Implications of Australian Economic Growth for Social Equity*)
- Ensuring Sustainability (Rand Corporation (Australia), *Australia's Comparative Advantage: Implications of Australian Economic Growth for Environmental Sustainability*)

**5. Policy directions and options**

- Pay-offs for New Reforms and Investment in the Future (Independent Economics, *Australia's Comparative Advantage: Scenario Modelling*)
- Public Attitudes to Stability and Change (Social Research Centre, *Australia's Comparative Advantage: Public Preference Study*)
- The Role of Leadership and Partnership (*Survey of CEDA Members for ACOLA Project*; *Survey of IPAA Members for ACOLA Project*; Eventures Australia, *Doing Business with Australia and Australian Organisations*; Social Research Centre, *Australia's Comparative Advantage: Public Preference Study*)

# 2

## Taking stock, looking ahead

Inevitably, the future is unknowable.

We can devise scenarios of what the future might bring given different conditions but the world is changing rapidly and there are no guarantees that scenarios will become reality. What we do know is that there are strengths Australia already has. There are opportunities out there. There are risks too and not all of those risks are negative.

When ranked against the rest of the world, or just the rest of the developed nations, Australia performs very well on a range of measures.

According to these measures, summarised below, Australia is a place that is good to live in. By contrast with international standards, government in Australia is seen to be relatively corruption free. It is relatively free economically and mostly a reasonable place to do business. Australians are generally happier with their lot than the international average. People can expect



to live longer and be well educated. The workforce is seen as flexible and adaptable and Australians are seen as prosperous. For a country with an outward focus that faces intense and growing international competition, business and government say they are willing to engage globally.

But taking best advantage of the existing strengths and building new ones in order to put the nation's best foot forward is the challenge. And in some areas, Australia is not yet seen as well equipped to meet that challenge.

Both international rankings and surveys of business raise questions about our ability to innovate or to make the most of what innovation exists. Business does not think it can always get the money it needs to grow and it questions the

quality of its own management. Industry agrees with the findings of international surveys about the constraints imposed by regulation.

Both business and public servants, as will be seen, question the quality and capacity of government, through its elected representatives, to respond including in some of the areas most tied to a global outlook. Business and bureaucrats do not see eye to eye on the major global risks that could hurt Australia or the risks Australia could benefit from, so resolution of the significance of these differences is important.

Understanding where we are and where we think we are is an important first step to understanding how to face a future that is challenging and uncertain.

## 2.1 Relative global performance

### 2.1.1 Benchmarking

Australians have long had a love affair with the underdog. Our most solemn national day commemorates a military defeat and our national song tells the tale of a sheep thief. The tall poppy syndrome where success is frowned upon is part of our national character. There are few occasions outside of sport where triumphs are celebrated.

Yet seeking to build Australia's comparative advantage will in part be a cause aimed at finding, celebrating and emulating what is done well. And then seeking to do more of it.

In order to identify where the gaps are in comparative advantage, it is important to find some benchmarks in the present so the pathways to the future can be mapped out.

To start this process, the ACA project analysed 16 different global ranking reports published by prominent organisations, see Kumar 2013b. They cover a range of issues that go to the heart of comparative advantage; social measures, the ease of doing business, innovation and competitiveness and education. On a few of the measures Australia does relatively well compared with the rest of the world. However its performance on many highlights gaps that will need to be addressed in order to build comparative advantage.

#### Strengths in society

Australia performs most strongly when it comes to a range of social measures highlighted in the global rankings reports. Whilst not necessarily directly related to doing business, they are

important in identifying some of the nation's strengths as a society and culture and some of the attributes others may consider worthy when considering doing business in or with Australia and Australians.

If Australia wants to attract more talented people or businesses looking for opportunities for growth or a base from which to expand into the growing Asian economies, then Australia is an attractive place to live. Four of Australia's six state capitals are considered amongst the most liveable in the world and one, Melbourne, is considered the most liveable (*Compendium of Global Ranking Reports, Economist Group Liveability Survey 2012*, in Kumar 2013b).

Australians are more satisfied with their lot than the average of their international counterparts. More than 84% of Australians say they have more positive experiences in their day than negative ones, above the OECD average of 80% (OECD *Better Life Index 2012*, Australia summary, in Kumar 2013b). Satisfaction or wellbeing are imperfect measures but the surveys show Australians live longer than most and incomes and employment levels are also higher than average (OECD *Better Life Index 2012*, Australia summary, in Kumar 2013b). Credit Suisse found Australia was first globally in median household wealth and second in mean household wealth (Kumar 2013b).

Australian governments are considered relatively corruption free and the services they provide, health and education, are ranked relatively highly (OECD *Better Life Index 2012*, OECD *Education at a Glance 2013*, in Kumar 2013b) although naturally there are mixed results in these and other surveys where some components perform better than others.

Table 2.1: Key social ranking studies

Report	Number of countries ranked	Australia's ranking
Better Life Index	36	1
Corruption Perception Index	176	11
Livability Survey	140 cities	Melbourne at number 1
Quality of Living and Quality of Infrastructure	460 cities	Sydney at number 10
Human Development Index	186	2

Source: Kumar 2013b.



Australia is a prosperous nation. On the survey results it is considered economically free, it ranks very well on human development, provides good infrastructure and is considered a good place to do business. Australian ranked third out of 185 countries on the Economic Freedom Index and fourth on the Prosperity Index (see Kumar 2013b).

## 2.1.2 Important weaknesses

### Competitiveness and innovation

But Australia is not scoring well on every measure.

For businesses in Australia and for those looking to do business in and with Australia, the global rankings reports identify some gaps in Australia's performance in a range of measures. In a number of the reports, Australia's regulation—including on labour and taxation—is found to place a high burden on business and Australia does not do well on competitiveness when it comes to measuring itself against similar advanced economies.

While Australia is reasonably good at basic innovation according to the ranking reports, it is not so good at the next stage of developing or commercialising those ideas, with making more of the ideas developed constrained by regulation, taxation and the efficiency of the bureaucracy.

On the question of innovation, the World Economic Forum's global competitiveness index measured Australia against similar countries. It categorised Australia as an 'innovation driven/ stage 3 economy' with 35 countries in the group. Of that group of Australia's peers, it ranked 20th.

The *Global Innovation Index* (Kumar 2013b) looked at a broad notion of innovation. It measured sub-

indices on innovation input (institutions, human capital and research, infrastructure, market and business sophistication) and innovation output (knowledge and technology outputs, and creative outputs) and produced an innovation efficiency ratio of the two.

On some measures Australia performed reasonably well but the performance on the efficiency index was markedly worse (Table 2.2).

The World Economic Forum's *Global Competitiveness Index* (WEF 2014) also looked at the problems business faces and found some of the biggest concerns in areas of the burden of government regulation. Restrictive labour regulation was the biggest problematic factor in doing business, followed by tax rates, inefficient government bureaucracy along with concerns about an inadequate supply of infrastructure. There was also concern, although to a lesser degree, about access to finance, a poor work ethic from the labour force and policy instability.

Mirroring results in other international surveys, there was little or no concern in the Global Competitiveness Index about crime, corruption, poor public health, inflation and government instability (Kumar 2013b).

In one of Australia's leading export industries, travel and tourism, Australia ranks well when measured against 140 other countries (11th) and very well when compared with the Asia Pacific region (2nd) but its performance is worse on price competitiveness (137th) environmental sustainability (56th) and ground transport infrastructure (49th) (*WEF Travel and Tourism Competitiveness Index* in Kumar 2013b).

**Table 2.2: Global innovation index measures**

Index	Australia rank	Australia score (0–100)	Top country score (0–100)
Global Innovation Index	17	55	64.78
Innovation Input Sub Index	10	64.6	73.6
Innovations Output Sub Index	22	45.5	63.11
Innovation Efficiency Index	81	0.7	1.1

Source: Kumar 2013b.

## Education

Providing high quality education from the early years through to tertiary and vocational education is intrinsically important to developing Australia's comparative and competitive advantage. Education is also one of Australia's biggest export earners as Australia currently is one of the primary destinations for international students. Maintaining and improving the education system that drives that export industry will be crucial in an increasingly competitive market.

There are many international measures for different aspects of the education system. In the measures studied for the *Compendium of Global Ranking Reports* (Kumar 2013b), the Australian education system does well at the school, tertiary and vocational stage, and particularly well at attracting foreign students to Australia's shores to study, although Australia does not spend more than the average of its peers on education in terms of government expenditure especially in pre-school and post-school education (OECD 2014a; OECD *Better Life Index* Australia summary in Kumar 2013b).

The picture for education and participation by women is mixed. The OECD *Better Life Index* finds there are not as many women earning the equivalent of a high school qualification as men, with the difference higher than the OECD average, and this suggests more needs to be done to strengthen participation of women in higher education (see Kumar 2013b). However

the OECD *Education at a Glance* survey (OECD 2014a) shows more young women than men are likely to have a tertiary degree in Australia. This does raise questions about the move into the workforce with Australia lagging behind best practice countries such as Canada and Scandinavia when it comes to female labour force participation (Figure 2.1).

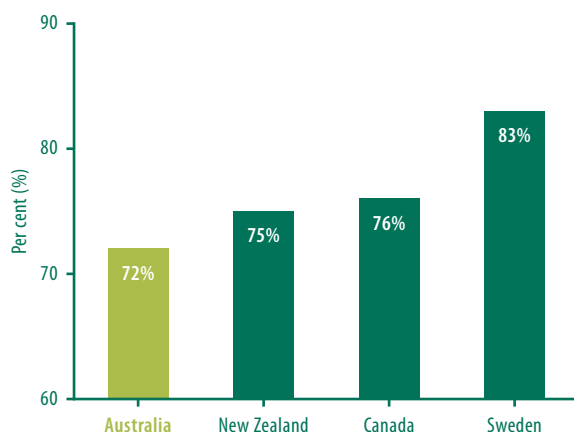
While Australia spends more than average on the early years of education, it does not result in getting the youngest students engaged with the system. The OECD *Education at a Glance Index* found participation in early childhood education is low in Australia compared to other OECD countries, particularly for three and four year olds where enrolment in pre-primary education is well below the OECD average (OECD 2014a). It found Australian early childhood education programmes typically start at a later age and are shorter in duration, with children moving into primary education earlier than in many OECD countries.

Another difference, and an important one given Australia has developed a model of mixing public and private spending in areas like education and health, is that Australia has more private investment in its education system than is the average for the OECD (Kumar 2013b; OECD 2014a). Average spending on pre-primary education relative to GDP is lower than the OECD average, and spending comes almost equally from public (56%) and private sources (44%) while the OECD average is for spending to come overwhelmingly (82%) from public sources (see Kumar 2013b and Box 2.1).

The higher than average private investment is also apparent in Australia's health system where spending by public sources is slightly below the OECD average, although the difference is not as clear as it is in education funding (OECD 2013b; Kumar 2013b) see Figure 2.2.

As with education, there is a higher proportion of private funding in health with spending funded by public sources slightly below the OECD average, although the difference is not as clear as it is in education funding (Kumar 2013b; OECD 2013b).

**Figure 2.1: Female labour force participation, 15–64, 2013**



Source: OECD 2014c.

### Box 2.1: Education investment

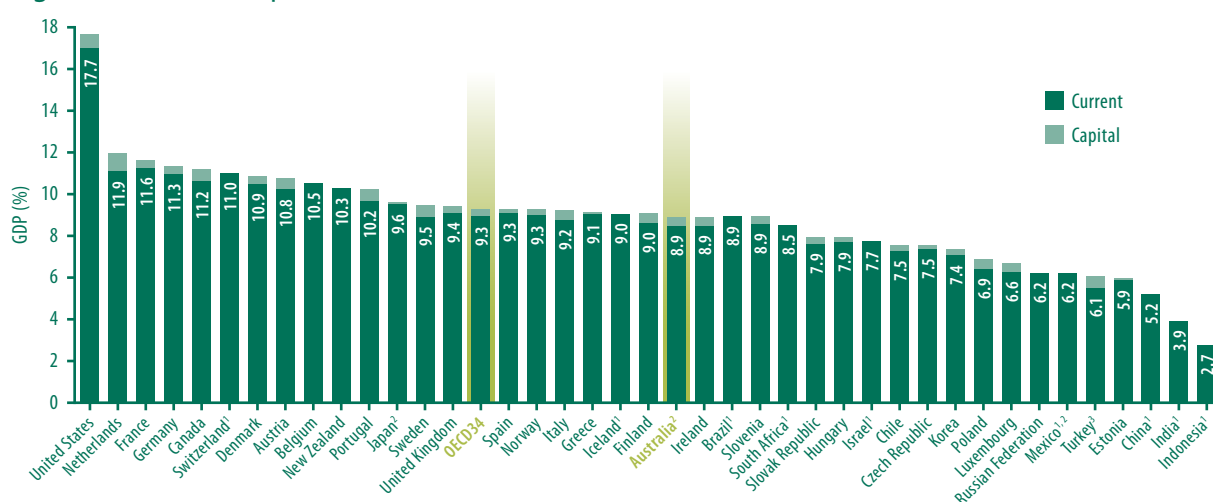
Australia's total expenditure for all levels of education relative to GDP in 2010 was 6%, similar to the OECD average. This is despite significant increases in government investment between 2008 and 2010; Australia's spending increased by 24%, more than four times the OECD average increase of 5%. In 2010, Australia devoted about US \$10,825 per student each year at all levels from primary to tertiary education, compared with the OECD average of US \$9313 per student.

However, the pattern of spending per student differs significantly across the education levels, with tertiary spending below OECD averages. The Public-Private mix of expenditure is distinctive in Australia.

In 2010, 74% of Australia's total expenditure on educational institutions came from public sources, which is lower than the OECD average of 84%. In fact, at 26%, Australia has the sixth largest proportion of private expenditure in the OECD for all levels of education compared with an OECD average of 16%. The share of private expenditure on pre-primary education was 44%, above the OECD average of 18% while, at tertiary level, 54% of all spending came from private sources, again much higher than the OECD average of 32%.

Source: OECD 2014a.

Figure 2.2: Health expenditure as share of GDP, OECD Countries, 2011



Note: 1. Total expenditure only. 2. Data refers to 2010. 3. Data refers to 2008.

Information on data for Israel: <<http://dx.doi.org/10.1787/888932315602>>.

Source: OECD Health Statistics 2013, <<http://dx.doi.org/10.1787/health-data-en>>; WHO Global Health Expenditure Database.

### Environment

Tackling environmental challenges well is not only important for sustainability, health and wellbeing but also as a potential area of comparative advantage. Australia is developing a clean, green reputation in order to expand both agriculture and tourism and there is potential to export expertise not only in those two industries but in other areas under the broad environment heading.

Australia's performance on a number of environmental measures is mixed and shows up some gaps, including some of clear significance for comparative advantage (Table 2.3).

Table 2.3: Key environmental performance indicator rankings

Indicator	Australia's ranking
Health impacts	1
Forestry	1
Water and sanitation	1
Water resources	9
Air quality	15
Biodiversity and habitat	44
Climate and energy	71
Fisheries	77
Agriculture	84

Source: See Kumar 2013b.

The Yale Environment Performance Index shows Australia does well on environmental measures such as health impacts (child mortality), water and sanitation, water resources and air quality (ranking 15).

It also ranks well or reasonably well on aspects of ecosystem vitality such as forestry, where the ranking has improved significantly over time, and water resources. However it has performed more poorly on biodiversity and habitat, agriculture, fisheries, and climate and energy.

In a separate index of energy sustainability Australia's performance in the energy sustainability index has also been improving overall over time, and it ranks especially well on energy equity and energy security. However its performance is not as good on environmental sustainability where it ranks 98th, according to this index.

### Summary

There are some lessons to be drawn from how Australia stacks up against the rest of the world when considering how to nurture comparative advantage which at its heart implies developing existing and new strengths to put Australia ahead of its competitors.

The *Compendium of Global Ranking Reports* (Kumar 2013b) shows that when measured against its peers, Australia's performance is not invariably stellar and the detail of the reports show there are clear gaps in performance.

Some of these gaps go to the heart of building Australia's comparative advantage, such as performance in innovation, the mixed performance in education and the relatively weaker performance in rules and regulations with concerns too about infrastructure in some areas.

These present not only a warning sign of where Australia may be falling behind what it thinks it is achieving but also an opportunity, a list of improvements to make and challenges to meet so on every measure it can consider itself amongst the world's best achievers (Table 2.4).

## 2.2 Comparative perspectives of stakeholders

### 2.2.1 Surveying decision makers

The global rankings tell the nation how Australia stands relative to others, by a range of measures. They present a snapshot of a moment in time of the Australian experience based on a range of statistics and other measures.

Those who deal with the day to day nature of the way Australia works have a more detailed, and in some cases, divergent view of our strengths and our weaknesses. Two large groups were surveyed for this project. Both are engaged in two of the most salient institutions in the country: industry and the public service. The findings are reported in detail in the project documentation and are the basis for this section.

The survey of industry was conducted amongst its membership by the Committee for Economic Development of Australia (CEDA). The Institute of Public Administration Australia (IPAA) conducted the survey of public servants with just over a third of responses from Commonwealth bureaucrats and the remainder from the State and Territory level.

The surveys, when taken in conjunction, indicate that two of the most important stakeholder groups which could drive change to build Australia's comparative advantage agree on a wide range of issues but do also have some significant areas of difference (Table 2.5).

### 2.2.2 At home and abroad

The two groups were asked a series of questions about Australia's socio-economic performance. They both strongly agreed, by a clear majority in both groups, that culture contributes strongly to the country's national wellbeing and for both the views on whether social inclusion operates well were mixed.

But there were clearer differences on two other points with a clear majority of public servants agreeing the resilience of the economy to economic cycles is high and only a minority agreeing ecological sustainability is being

adequately addressed. On both of those points the industry respondents' views were more evenly split. Less than half of the industry respondents agreed the economy is resilient and less than a third believed the way ecological sustainability is addressed is adequate.

However the responses of both do pick up some of the points highlighted in the global ranking reports on aspects of Australia's social culture but also indications of poorer performance on ecological sustainability.

## The global outlook: risks and opportunities

An assessment of the global risks and opportunities also sees some divergent views between the industry and bureaucracy respondents.

Both industry and public service respondents rated the changes in Asia, with the rising economic role of emerging economies and its resultant rising Asian middle class, as positive changes for Australia. They see risks and opportunities from the environment with

Table 2.4: Australia global rankings snapshot

Report	Year published	No. of countries ranked	Australia ranking, most recent year	Preceding year's ranking
OECD: <i>Better Life Index</i>	2014	36	1	1
Transparency International: <i>Corruption Perception Index (CPI)</i>	2014	174	11	7
OECD: <i>OECD Health Data 2013</i>	2015	36	17 Health exp. as share of GDP 13 Health exp. per capita, public exp.	19 Health exp. as share of GDP 13 Health exp. per capita, public exp.
INSEAD: <i>Global Innovation Index (GII)</i>	2014	143	Overall rank 17 Efficiency ratio 81	23 107
World Economic Forum: <i>Global Competitiveness Index (GCI)</i>	2014–15	144	22	20
IMD: <i>IMD's World Competitiveness Scoreboard</i>	2013	60	16	15
Doing Business: <i>Ease of doing business index</i>	2015	189	10	10
World Energy Council: <i>Energy Trilemma Index</i>	2014	129	13	14
Heritage Foundation: <i>Economic Freedom Index</i>	2015	178	4	3
The Economist group: <i>Liveability survey 2014</i>	2014	140 cities	Melbourne (1), Adelaide (5), Sydney (7), Perth (9)	Melbourne (1), Adelaide (5), Sydney (7), Perth (9)
Mercer: <i>Mercer's Quality of Living and Quality of Infrastructure Ranking</i>	2015	460 cities globally	Sydney (10), Melbourne (16), Perth (22), Adelaide (27), Canberra (30), and Brisbane (37).	Sydney (10), Melbourne (17), Perth (21), Adelaide (29), Canberra (26), and Brisbane (37).
WEF: <i>WEF Travel and Tourism Competitiveness Index (TTCI)</i>	2015	140	7	11
Legatum Institute: <i>Legatum Prosperity Index</i>	2014	142	7	2
UN Development Programme: <i>UNDP Human Development Index (HDI)</i>	2014	186	2	2
OECD: <i>OECD Education at a Glance</i>	2014	33	22 Total exp. on educational institutions as percentage of GDP, 10 as % of total public expenditure	19 Total exp. on educational institutions as percentage of GDP, 8 as % of total public expenditure

possibilities in improving sustainability. And they both see opportunities in technology although they view the opportunities differently and industry gives less weight to its potential.

Both worry about increasingly sophisticated organised crime but again industry is less concerned. Both are concerned about the risks posed to Australia from persistent and large fiscal imbalances in major world economies but here the public servants are less worried.

From there the views do nevertheless diverge with each group seeing dangers in risks that more directly relate to their work. Public servants are worried about an ageing population, and geopolitical problems, whereas industry is more concerned about financial contagion (Table 2.6).

A question does arise about whether industry sees comparative advantage or opportunity in issues that respondents rate as having a large impact on Australia, whether it is a negative or positive impact. Industry respondents were asked whether the risks would have a large or small impact on Australia. The rising Asian middle class, the rising economic role of emerging economies and global fiscal imbalances were rated as having a large impact on Australia. Some of those areas nominated as trends were also thought to have a small impact by a majority of respondents

including species overexploitation, the risk of pandemics and the proliferation of organised crime.

There are opportunities as well as challenges in the areas industry believes are global trends regardless of whether they are seen as positive or negative for Australia. With some of those seen as having only a small impact on Australia by industry it does raise the possibility that, having identified an issue as a significant problem, the opportunities for business in dealing with it innovatively may be missed because it is not seen as a difficulty.

What is clear is that industry respondents to the CEDA-ACOLA Survey expect strong competition both globally and domestically in some of the sectors likely to be most important to the country's present and future. These industries where competition is expected to be high or very high at both the domestic and international level include manufacturing, education, agriculture, mining, retail and wholesale trade, financial and insurance services, and professional, scientific and technical services.

According to the survey some of those industries where competition is expected to be high also expected strong global demand. These include in agriculture, education, financial service and

**Table 2.5: Stakeholder survey respondent information**

CEDA-ACOLA survey	IPAA-ACOLA survey
The survey was conducted with the Committee for Economic Development of Australia	The survey was conducted with the Institute of Public Administration Australia
The CEDA-ACOLA survey received 411 responses. 70.5% of those were complete responses, 29.5% were partial responses.	The IPAA-ACOLA survey received a total of 857 responses of which 734 (86%) complete responses were recorded and 123 (14%) were partial responses.
<p>The survey participants came from a range of industries:</p> <ul style="list-style-type: none"> <li>• 15% from Professional, Scientific and Technical Services</li> <li>• 11% from Electricity, Gas, Water and Waste Services</li> <li>• 11% from Education and Training</li> <li>• 10% from Mining</li> <li>• 9% each from Construction and Mining</li> <li>• 7% from Financial and Insurance Services</li> <li>• 6% from Public Administration and Safety</li> <li>• 5% from Agriculture, Forestry and Fishing</li> <li>• 17% from all others combined</li> </ul>	<p>62% respondents were from the state/territory level and 35% from the Commonwealth.</p> <p>50% of the responses came from these agencies:</p> <ul style="list-style-type: none"> <li>• 14% from Central Agency</li> <li>• 12% from Infrastructure Services</li> <li>• 12% Social Services</li> <li>• 11% Health</li> <li>• 9.8% Education</li> </ul> <p>Amongst the 11.6% of responses from Others Agriculture and Food Production was largest area with 9%.</p>

Source: Kumar 2013a; Kumar 2014.

professional services, mining and wholesale trade. However just under half of respondents expect global demand to be strong for manufacturing and fewer than 40% expect strong global demand in retail trade.

It is worth noting that the survey of industry was conducted as the changes in the mining sector were beginning to emerge but before the full scope of both the tapering of growth in China and the impact of the increased production on prices was evident.

Both groups of respondents believe they are willing to face the expected global competition and are engaged with some of the global issues. However this is not consistent across all industries and awareness of what other countries are doing in some areas where Australia could play to its strengths and take advantage of opportunities, such as health, finance and education, is rated more as average than high or very high. In some areas highlighted in the global ranking reports of relatively weak performance by Australia such as environmental services

and taxation, and in areas where Australia is looking to improve its comparative advantage and exports such as industry, infrastructure and health, the awareness of global directions by Ministers and officials is seen as low or only average (Figures 2.3 & 2.4).

### 2.2.3 Impediments to growth

There seems to be a degree of pessimism when it comes to whether industries and policies are in the right shape to face competition and what the prospects are for growth in some sectors. This is particularly so for some of the key enablers such as infrastructure, education and research.

Basic infrastructure is not seen as adequate by both groups. Fewer than half of the respondents in each group agree the education system is imparting the skills needed for a competitive knowledge economy or that basic research is strong. For both groups only a minority believe the knowledge transfer and technological cooperation between universities and companies is well developed.

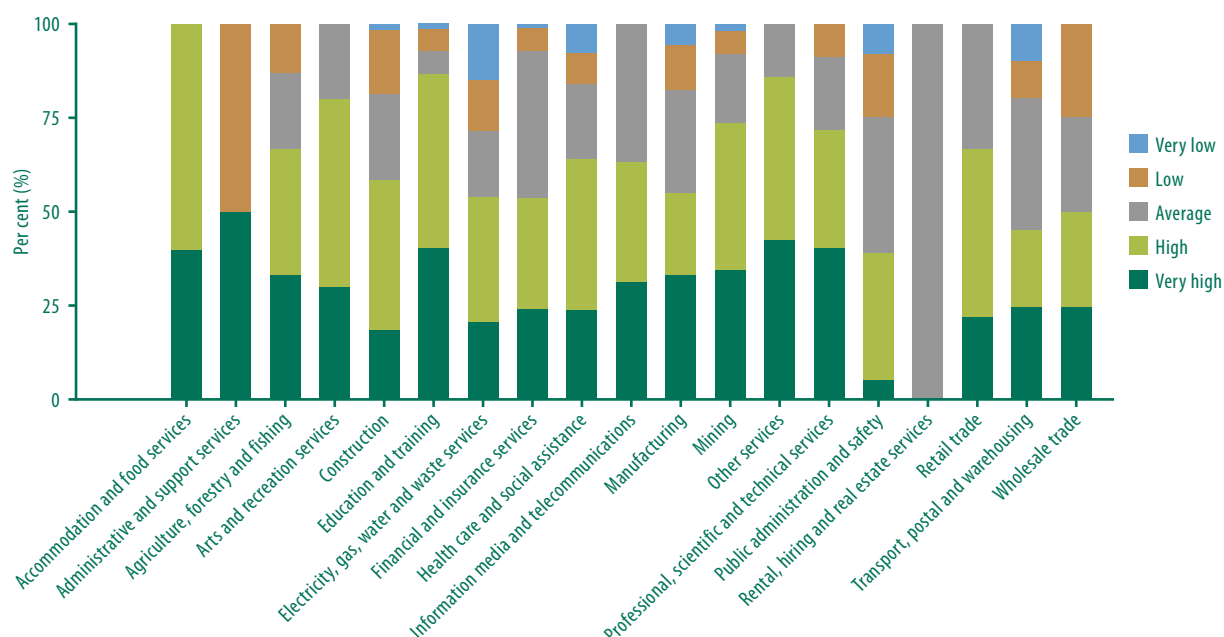
Table 2.6: Global trends

Global trends which could have a positive impact on Australia's comparative advantage over the next 25 years (areas of agreement in bold)	
Industry	Public servants
<b>Growth of an increasingly affluent middle class across Asia</b>	New technologies in energy, materials and digital areas
<b>Rising economic role of emerging economies</b>	New biological technologies
<b>Diffusion and harmonisation of technology across trading partners</b>	<b>Growth of an increasingly affluent middle class across Asia</b>
<b>Increased emphasis on environmental sustainability</b>	<b>Increased emphasis on environmental sustainability</b>
<b>Demand for a new energy mix to reduce fossil fuel use</b>	Rising economic role of emerging economies
Global trends which could have a negative impact on Australia's comparative advantage over the next 25 years (areas of agreement in bold)	
Industry	Public service
<b>Vulnerability to cyber attacks</b>	Geo-political conflicts
<b>Proliferation &amp; increasing sophistication of organised crime</b>	Declining political capability in democracies
<b>Risk of spread of financial contagion</b>	<b>Trend towards biodiversity loss</b>
<b>Trend towards species overexploitation</b>	<b>Proliferation &amp; increasing sophistication of organised crime</b>
<b>Increased risk of pandemics</b>	<b>Major fiscal imbalances in global economies</b>
<b>Persistent and large fiscal imbalances in major world economies</b>	<b>Risk of financial contagion</b>
<b>Lack of global consensus on climate change</b>	<b>Vulnerability to cyber attacks</b>
<b>An ageing population in developed countries</b>	

Source: Kumar 2013a; Kumar 2014.

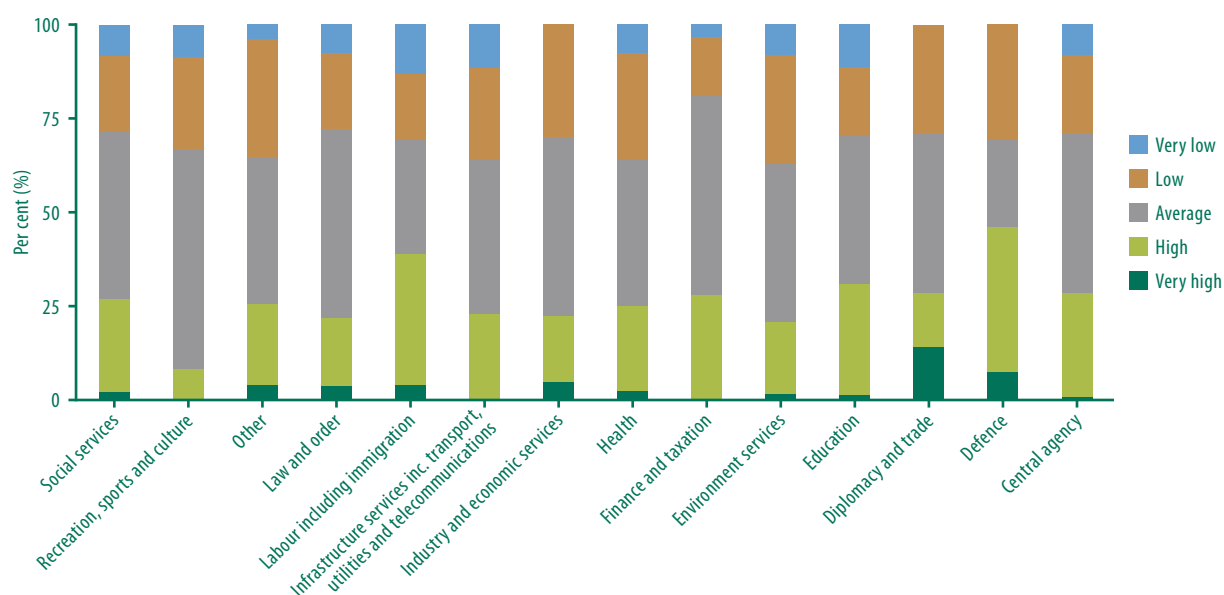


Figure 2.3: Willingness to engage globally



Source: Kumar 2013a.

Figure 2.4: Awareness of other country or global directions in the respondent's core area



Source: Kumar 2014.

The respondents to the CEDA-ACOLA survey also rated the ability of industry to innovate or adopt innovative ideas as only average across industries (Box 2.2).

While the two groups surveyed agree on some of the impediments to making the most of the opportunities, their views differ as to what the challenges are. For industry, getting enough finance to allow them to take risks emerges as a significant problem. In the CEDA survey, industry

respondents rate availability of finance as high or very high only in the financial services industry.

So, while on most business efficiency measures the views of the public servants broadly line up with their industry counterparts, this was not the case on this issue of access to finance and credit. While more than half of the industry respondents believe financial constraints are impeding the willingness and ability of firms to take risks, less than one third of the public servants surveyed think this is the case.



## Box 2.2 Innovation Capability

There are some industries where respondents rate the ability of the industry to innovate or adopt innovative ideas as high or very high. These are:

Arts and recreation services, retail trade, transport, postal and warehousing.

Industries where respondents rated the ability to innovate or adopt innovative ideas as low or very low were:

Public administration and safety, and electricity, gas, water and waste services.

Largely ability of industry to innovate or adopt innovative ideas is rated as average across industries.

Source: Kumar 2013a.

## Risks and opportunities

While there is some major agreement on where the global changes may present new opportunities, the groups do not see eye to eye on what the risks might be.

Both industry and public service respondents rated the changes in Asia, with the rising economic role of emerging economies and its resultant rising Asian middle class, as positive changes for Australia.

They see risks and opportunities from the environment with possibilities in improving sustainability.

And they both see opportunities in technology although they view the opportunities differently and industry gives less weight to its potential.

Both worry about increasingly sophisticated organised crime but again industry is less concerned.

Both are concerned about the risks posed to Australia from persistent and large fiscal imbalances in major world economies but here the public servants are less worried.

From there the views really diverge with each group seeing dangers in risks that more directly relate to their work.

Public servants are worried about an ageing population, and geo-political problems where industry is more concerned about financial contagion (Figures 2.5 & 2.6).

A question does arise about whether industry sees comparative advantage or opportunity in issues respondents' rate as having a large impact on Australia, whether it is a negative or positive impact.

For example while industry respondents rate some risks highly, they do not rate the intensity of the impact of that risk on Australia as high at all. It could be possible, that having identified an issue as a significant problem, the opportunities for business in dealing with it innovatively may be missed because it is not seen as a difficulty for Australia (Figure 2.7).

## Leadership

What is clear from the surveys is that neither group is particularly optimistic about the people who will lead them into the future. Industry respondents rate the quality of management as just adequate with only high to very high ratings for quality of management in the financial services and retail trade sectors (Figure 2.8).

Neither group has a high opinion of the political system. Almost three-quarters of industry respondents disagreed with the proposition that the political system fosters national progress (ACOLA-CEDA SAF01 Survey Analysis). The view of the public servants was more mixed but nearly half also disagreed with the proposition.

A majority of industry respondents disagreed that public finances were being well managed and that labour regulations appropriately support business activity. A higher proportion, although still a minority of public servants, thought public finances are being well managed and there was a similar result for the issue of labour regulations.

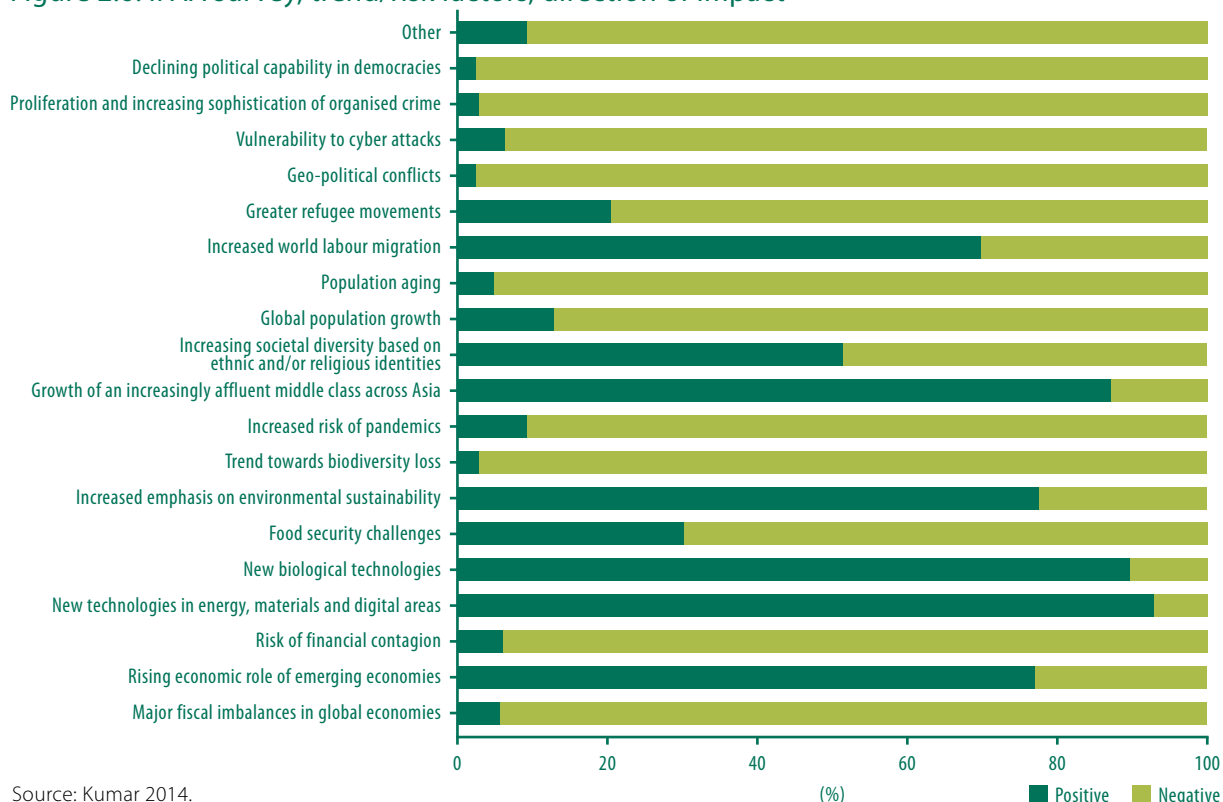
A clear majority of the public servants agreed the general legal and regulatory framework works well. Industry's view was more mixed with views equally split between whether it works well and whether it does not.

Figure 2.5: CEDA survey, external global risk factors, direction and extent of impact

Risk factor	Positive	Negative	No. of responses
1. Persistent and large fiscal imbalances in major world economies	12%	<b>88%</b>	285
2. Rising economic role of emerging economies	<b>84%</b>	16%	285
3. Lack of global consensus on climate change	17%	<b>83%</b>	284
4. Trend towards species overexploitation	9%	<b>91%</b>	280
5. Increased emphasis on environmental sustainability	<b>81%</b>	19%	283
6. Greater global population movements	63%	37%	282
7. Increased risk of pandemics	10%	<b>90%</b>	281
8. Convergence of productivity globally	60%	40%	282
9. Convergence of labour costs across major trading partners	64%	36%	280
10. Diffusion and harmonisation of technology across trading partners	<b>82%</b>	18%	280
11. Rapid technological obsolescence	36%	64%	281
12. Demand for a new energy mix to reduce fossil fuel use	72%	28%	282
13. Growth of an increasingly affluent middle class across Asia	<b>97%</b>	3%	283
14. Unforeseen consequences of life sciences technology and nanotechnology	61%	39%	279
15. Increasing societal diversity based on ethnic and/or religious identities	67%	33%	280
16. An ageing population in developed countries	19%	<b>81%</b>	281
17. Increasing urbanisation	59%	41%	281
18. Increased product fragmentation	53%	47%	279
19. Risk of spread of financial contagion	7%	<b>93%</b>	277
20. Vulnerability of cyber attacks	2%	<b>98%</b>	281
21. Proliferation and increasing sophistication of organised crime	4%	<b>96%</b>	279

Source: Kumar 2013a.

Figure 2.6: IPAA survey, trend/risk factors, direction of impact



Source: Kumar 2014.

Figure 2.7: CEDA survey, extent of impact

Risk factor	Large	Small	No. of responses
1. Persistent and large fiscal imbalances in major world economies	<b>81%</b>	19%	281
2. Rising economic role of emerging economies	<b>85%</b>	15%	281
3. Lack of global consensus on climate change	51%	49%	280
4. Trend towards species overexploitation	36%	<b>64%</b>	277
5. Increased emphasis on environmental sustainability	55%	45%	280
6. Greater global population movements	54%	46%	279
7. Increased risk of pandemics	32%	<b>68%</b>	278
8. Convergence of productivity globally	59%	41%	279
9. Convergence of labour costs across major trading partners	58%	42%	277
10. Diffusion and harmonisation of technology across trading partners	50%	50%	277
11. Rapid technological obsolescence	45%	55%	278
12. Demand for a new energy mix to reduce fossil fuel use	70%	30%	279
13. Growth of an increasingly affluent middle class across Asia	<b>87%</b>	13%	279
14. Unforeseen consequences of life sciences technology and nanotechnology	36%	<b>64%</b>	276
15. Increasing societal diversity based on ethnic and/or religious identities	34%	<b>66%</b>	277
16. An ageing population in developed countries	58%	42%	278
17. Increasing urbanisation	56%	44%	278
18. Increased product fragmentation	18%	<b>82%</b>	276
19. Risk of spread of financial contagion	67%	33%	274
20. Vulnerability of cyber attacks	44%	56%	277
21. Proliferation and increasing sophistication of organised crime	35%	<b>65%</b>	275

Source: Kumar 2013a.

### Box 2.3: Stakeholder performance

Performance level of community groups, academics, officials and business groups have been rated positively as compared to that of elected representatives, trade unions, traditional media, social media and consultants.

The performance trend is on the rise for social media and community groups as compared to the falling levels for elected representatives, trade unions and traditional media.

Performance trend for officials, business groups, consultants and academics is considered stable by the respondents.

Source: Kumar 2014.

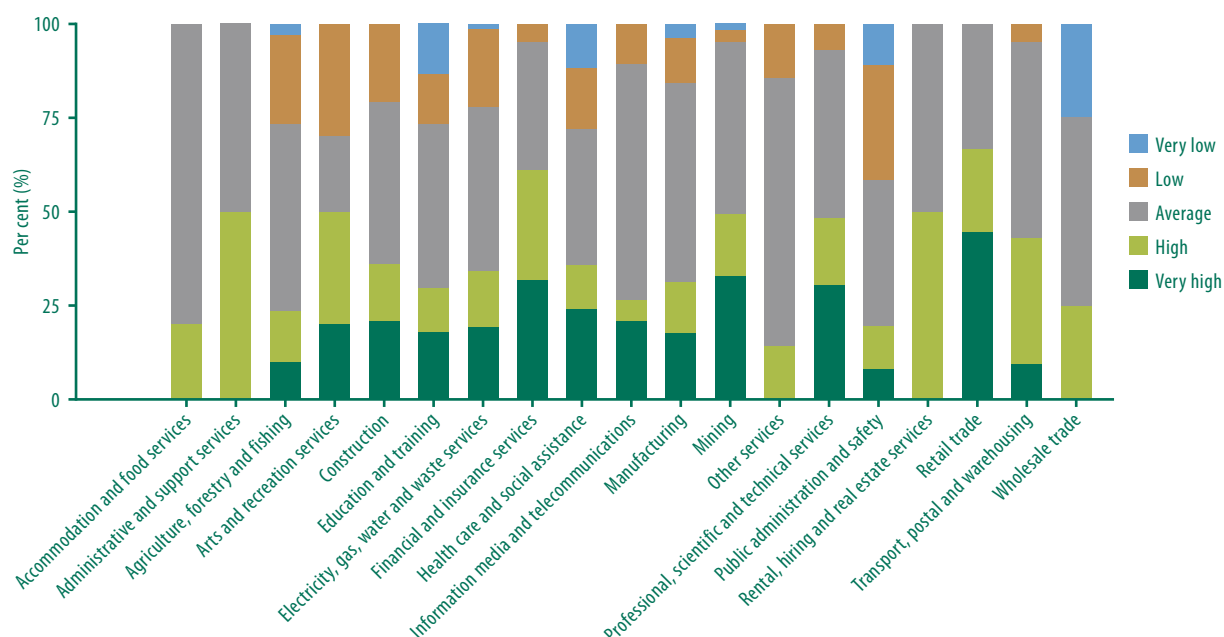
### Government leadership

The survey of public servants asked a detailed set of questions about performance of the major stakeholders (Box 2.3).

The ratings for both performance and the trend on performance were worse almost in equal measure for both elected representatives and the

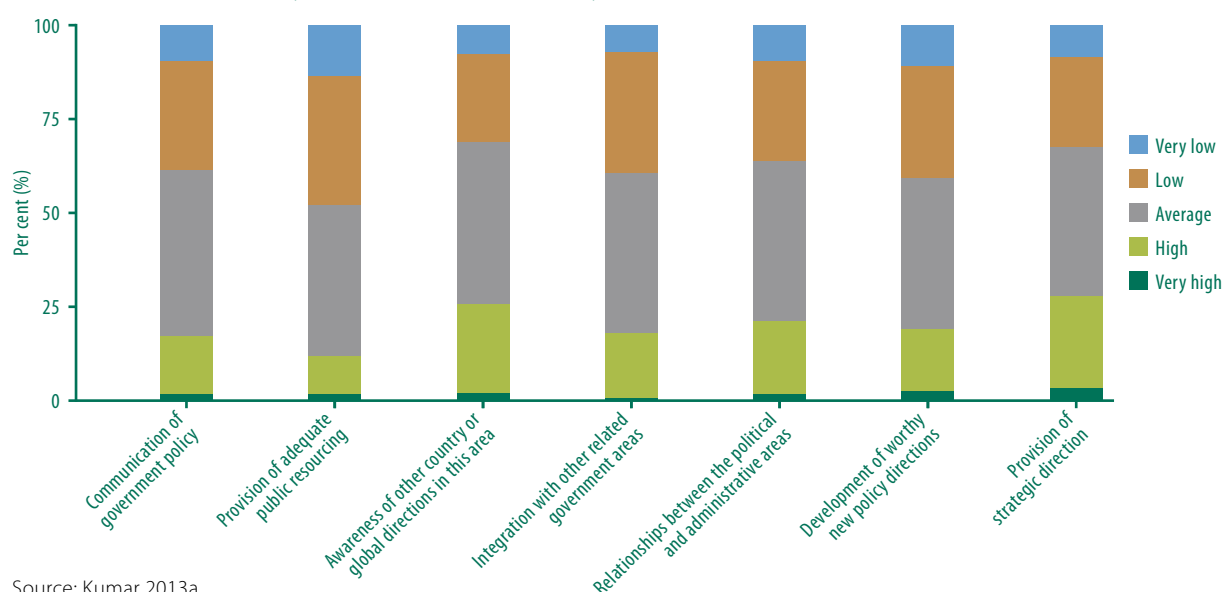
traditional media (IPAA-ACOLA Survey analysis, Tables 3a & 3b). And while they think their masters, government ministers, are well aware of the international issues, they have questions about the ability of ministers and officials to provide both strategic and new policy direction (Figure 2.9).

Figure 2.8: CEDA survey, quality of management



Source: Kumar 2013a.

Figure 2.9: CEDA survey, assessment of general policy performance by government (meaning ministers supported by officials, across activity areas)



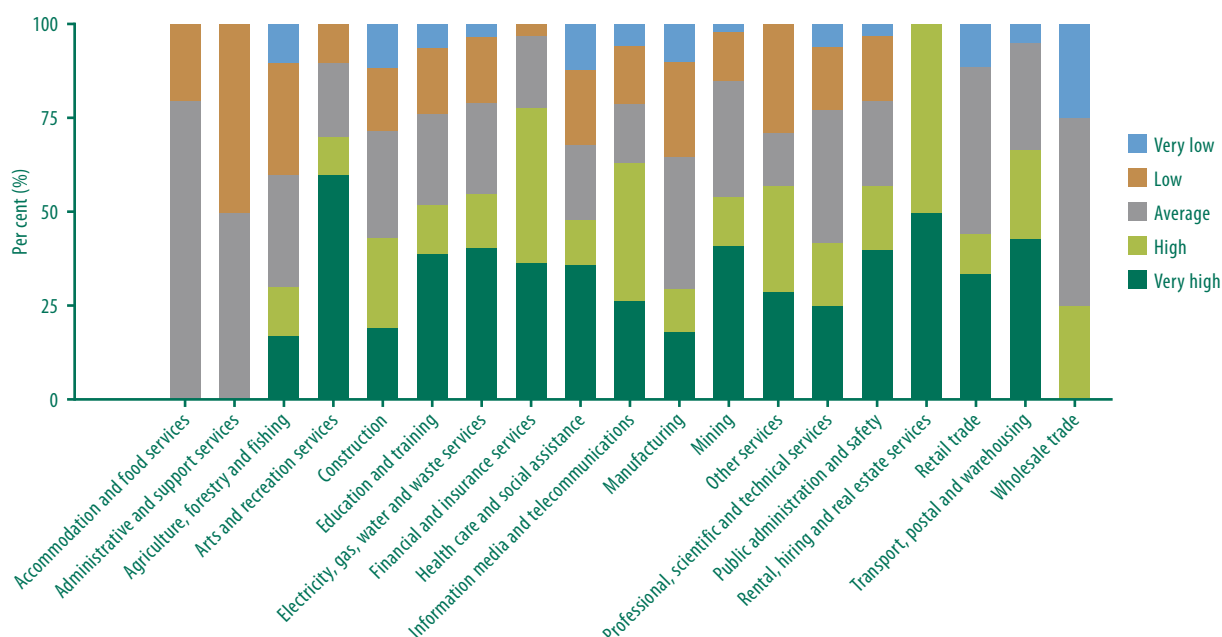
Source: Kumar 2013a.

Government performance matters to industry with a range of respondents to the ACOLA-CEDA survey saying government policies have a high to very high impact on industry growth. This was particularly the case in the categories of financial services, education, mining, rental services, the arts, and transport services. It was not seen as the case in agriculture or in manufacturing, two industry sectors which have long been open to the forces of global competition (Figure 2.10).

## Summary

The responses to the surveys, particularly the responses from industry participants, show that some of the sectors which are or will be important to building comparative advantage face strong competition both domestically and overseas. The conditions they are operating under including government policy leadership and access to finance could be constraining their ability to take risks. The issue of access to finance is one that was highlighted in the global

Figure 2.10: CEDA-ACOLA SAF01 survey, impact of government policies on industry's growth



Source: Kumar 2013a.

ranking reports as a concern and on this crucial issue for growth there appears to be a disconnect between the views of industry and the views of bureaucrats.

There are also issues raised in the surveys for some of the drivers of comparative advantage including skills and innovation and a clear sense that links between business and universities are not working as well as they could be.

The surveys pinpoint some areas where, given the right conditions and leadership that is up to the task, Australia can take advantage of the opportunities that global change afford.

But there are vulnerabilities too, and some of those exist in the possibilities not seen which could affect resilience. Both industry and public servants see little positive coming from areas like cyber security, the ageing population and health issues like pandemics, yet they could provide opportunities for an Australia focused on solving the challenges rather than just seeing them as risks.

While there are predominant areas of agreement between the two groups, the areas of disagreement highlight the importance of ensuring these two key stakeholders in Australia's future better understand each other. While some of the differences are a result of the different

responsibilities they have, communicating those so both have a better and broader understanding is likely to be valuable.

## 2.2.4 Further perspectives: global business and the academics

The ACA project also sought additional insight to complement the views of the industry and the public sector. Research was conducted with two particular groups:

- a survey of global business executives familiar with Australia
- an 'Ideas Jam' involving online discussion with senior and early career academics and medical researchers.

## 2.2.5 Global business

Foreign business executives with experience doing business in and with Australia and Australians working for overseas businesses have identified some of the same strengths and weaknesses as both the international rankings reports and the survey of Australian industry figures.

Dr Ralph Kerle conducted a global business survey for the Australian Council of Learned Academies. There were 262 people surveyed and

a majority of those identified as senior executives or owners of a company. Of those, 61% are foreign nationals and almost 40% work for companies with headquarters outside Australia. A quarter of those surveyed have worked in Australia for three years or less and just over 40% have worked in Australia for more than 20 years.

### The Australian workforce

Those surveyed look favourably on the Australian workforce, viewing it as productive, well-educated and easy to work with. A majority of those surveyed agreed that Australian workers are flexible and adaptable when faced with new challenges, are open to new ideas and have a strong work ethic. More than three-quarters believed Australia has capable scientists, engineers and mathematicians.

Fewer than half though viewed Australian workers as tolerant of different cultures although foreigners were more likely to agree with the proposition than Australians. Workplace regulations were also not seen by a majority as harmonious and productive.

Views on leadership are more mixed. While a majority of respondents say it is clear who has the decision making role, responses on whether Australians tend to lead rather than follow are more mixed.

In fact, on most of the measures, areas seen as fostering a culture of innovation are viewed much more favourably by foreigners than by Australians, as were the capacities of the workforce (Table 2.7). This issue of leadership is discussed further in Chapter 5.

### Innovation culture support

Australians are not seen by those surveyed as worse at growing, running and managing businesses than those in other countries and they likewise are seen as just as entrepreneurial as those in other countries if not more.

However the survey has raised some questions about the culture of innovation and support for that culture by government.

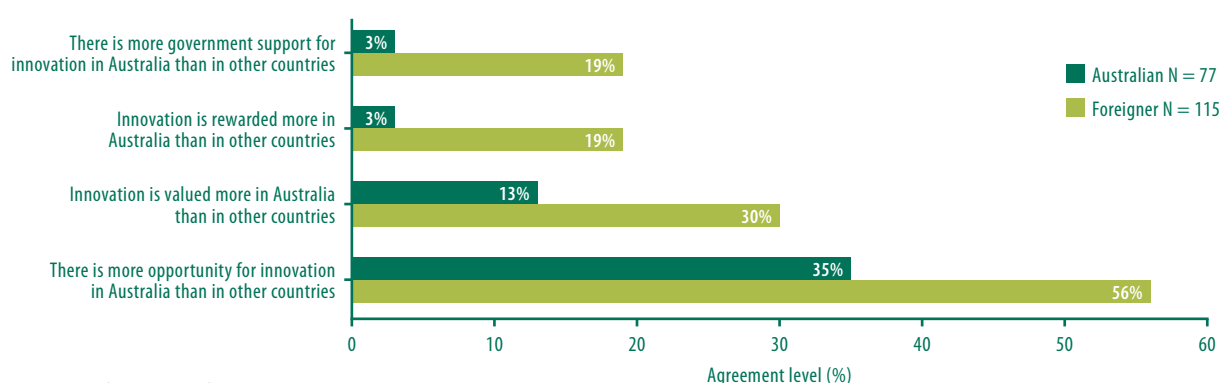
On many measures of support for innovation, such as policy, taxation laws and structures,

**Table 2.7: Global views on innovation culture**

% agree	Foreigners	Australians
Australians are open to change	60%	44%
Australia manages its natural resources efficiently	60%	26%
Australian education in maths and science is excellent	55%	25%
Australia's manufacturing capability is strong	50%	14%
Australians are willing to take risks	64%	48%
The quality of management leadership in Australia is high	63%	42%
Australians are quick to adopt global best practice	58%	41%

Source: Halteman, Kerle & Lerner 2015.

**Figure 2.11: Supporting innovation, agreement level by nationality**



Source: Halteman, Kerle & Lerner 2015.

strategic direction, investment and intellectual property laws, fewer than half of the foreign respondents rated the performance by government as supportive and the rating by Australian business people was significantly lower than that.

For example 40% of foreigners agreed that government provides strategic direction pertaining to innovation while only 5% of Australians agreed.

As seen in Figure 2.11, the support for and value of innovation in Australia is also rated quite low.

Views are also mixed on how well Australia commercialises its innovation: 77% of foreigners believe Australia does the same or better than other countries while only 34% of Australians do.

Respondents have also identified the levels of government, the time consumed by rules and regulations and the support for business incubation and growth as problem areas.

### Finance and risk

Concerns about access to finance identified by industry in the survey earlier in Chapter 2 are also echoed in this survey.

A majority of those surveyed believe financial and credit constraints impede innovation activities in Australia. This was the case across all respondent groups whether they worked for a company with headquarters inside or outside Australia or were self-employed working inside or outside Australia. Those who are self-employed feel the constraints more strongly than others.

On risk-taking there is a middling perception (Table 2.7) of attitude to risk, though other evidence shows this to be less evident for innovation itself (Samson & Gloet 2013). Other evidence also shows risk attitudes over the long period of Australian prosperity in recent decades to have been fairly stable (West & Worthington 2014).

### Summary

This survey does repeat some messages seen earlier in this chapter. Australia has some distinct advantages that could contribute to both fostering a culture of innovation and improving its comparative advantage. A skilled workforce is one of these, although as seen particularly

in differences between global ranking reports and the earlier industry survey, views on the education system are much more favourable overseas than domestically.

There are striking differences in the way Australia is viewed by foreigners and by Australians, even those who have experience working overseas. However there is agreement across the two surveys in this chapter and some of the detail in the ranking reports that government could do more to foster innovation including looking at taxation and workplace regulations, and that access to finance is a problem that needs to be tackled.

### 2.2.6 Ideas Jam

Ensuring Australia not only makes the most of its comparative advantage but builds new strengths for the future will require input and ideas from a broad spectrum of society.

To encourage the generation of ideas about identifying strengths and weaknesses that are likely to be the most important for future comparative advantage, the Australian Council of Learned Academies undertook The Australia's Comparative Advantage Challenge in March and April 2014.

The Challenge was made available across the disciplinary spectrum represented by the four Australian Learned Academies, the Australian Research Council and the National Health and Medical Research Council, including early career researchers. Participants were asked to respond to ten Challenge questions under the general theme of identifying potential sources of future comparative advantage and ways to address areas of weakness for Australia

A range of ideas was discussed including building better links with overseas universities, and an issue raised in some of the earlier work in Chapter 2, improving cooperation between universities and the business sector.

The Challenge also canvassed ways to tackle the brain drain such as encouraging young scientists to go overseas for a while but providing them with pathways back to Australia. Discussion also covered promotion of a multi-lingual Australia and providing more opportunities for early career researchers from R&D budgets.

Improving the process of research grants was also the subject of considerable discussion as was imagining different ways of promoting long term R&D funding at arm's length from government.

The Challenge question that attracted the highest proportion of participant contributions was 'What factors could further support an active and excellent research and development and innovation system, including through collaboration?' The idea resonating most strongly with the participant group, was 'Innovation that does not require continued economic growth to produce outputs'. The conversation centred on how innovation can shape growth but also how innovation can shape lives through improving health care in particular.

There was debate too about making the most of innovation such as creating a Silicon Valley model for Australia, and better understanding the barriers to creating new and successful companies which can commercialise ideas emerging from basic research.

The value of humanities education, debate about population growth, tackling climate change and ideas about improving the emissions from brown coal as well as taking advantage of Australia's comparative strength in agricultural production to cater to a growing Asian market were also raised during the discussion.

Detailed discussion of the content of the individual ideas is given in Vulture Street (2015). In the tables that follow from this exercise, 'top' ideas are first listed in terms of the number of 'promotes' (popularity) from participants. This indicated support for the importance of the issue for discussion. 'Demote' was a vote to downgrade discussion of the issue. The second table lists ideas by all votes whether positive or negative, plus other measures of participation or activity. There were 98 participants in this Ideas jam.

Table 2.8 shows the top five ideas posted during the Challenge by group-voted popularity.

Table 2.9 shows the top five ideas by activity generated, across ideas, comments and votes (whether positive, negative or 'no opinion' votes).

**Table 2.8: Top five ideas by popularity**

Idea title	Promotes	Demotes	Net score	Comments
Innovation that does not require continued economic growth to produce outputs	18	0	18	11
Send them all out...and get them back again!	17	0	17	10
Long term R&D at arm's length from government	17	1	16	12
Reduce the burden on collaboration with overseas partners	15	0	15	4
A silicon valley model for Australia	13	0	13	7

Source: Vulture Street Innovation 2014.

**Table 2.9: Top seven ideas by activity**

Idea title	Promotes	Demotes	Comments
How to get more from our universities	13	4	12
Innovation that does not require continued economic growth to produce outputs	18	0	11
Long term R&D at arm's length from government	17	1	12
Send them all out...and get them back again!	17	0	10
An ARC small grants scheme?	13	1	8
A silicon valley model for Australia	13	0	7
Reduce the burden on collaboration with overseas partners	15	0	4

Source: Vulture Street Innovation 2014.



## 2.3 Current priorities and focus

### 2.3.1 Studying the nation

Some of the problem areas highlighted both in the international rankings and by industry and public service surveys are not new.

Indeed some of them have been very well studied in the past by both government and private institutions. Australia is not short of studies about aspects of national life and some areas have been the subject of intense study over the last few years. There have been multiple reports on education and skill needs. Productivity, competitiveness and innovation are also not short of reports about the present and the future.

Taxation policy receives intense attention infrequently, although the Government has embarked on the second major review of taxation in five years. It is also in the process of reviewing the Federation.

### 2.3.2 Comparing the reports

The compendium of reports looked at 35 reports in recent years on basic issues of importance to Australia's economy and the nation's wider future (Table 2.10).

The review of the reports found most are quite narrow in their scope and the range of

methodologies they use for their analysis and results. They vary considerably in their coverage complexity and advocacy role. They have in common an overarching emphasis on the main global mega-trends (Box 2.4).

The reports call for Australia to play to its strengths and comparative advantages in order to respond to the trends (Box 2.5).

Naturally, new reports continue to be provided since the time of the stock take reported here. (With Box 2.6 providing a list of some major current inquiries).

### 2.3.4 Finding further evidence

The reports are major resources for policy for the future, but there are systemic weaknesses. For example, the reports typically neither evaluate the evolution of the natural strengths relative to each other nor, in some cases, how they can be sustained or enhanced. They also do not identify the new comparative advantages Australia would need or how it would get them in order to respond to the rapidly changing global environment. Equally, how much gain there is from redressing disadvantages versus support of strengths or the balance between these is little debated. It is useful to view the reports under an overall coherent Drivers and Enablers framework to help illustrate the challenges and capabilities for Australia in attaining the goal of national

#### Box 2.4 Identified mega-trends in reports

The rise of Asia, particularly India and China.

Global demand for resources and the resultant terms of trade boom.

Increasing opportunity for the uptake of a wide range of new technologies.

An increased and unprecedented IT connectivity in particular.

An ageing, yet for Australia increasingly diverse, domestic population.

Source: Gupta 2013.

#### Box 2.5: Identified strengths in reports

A vibrant, multicultural society.

An excellent education system, underpinned by world-class research.

A mutually reinforcing troika of rule of law, a strong democratic system, and stable and efficient institutions.

One of the best resource endowments in the world.

Source: Gupta 2013.

**Table 2.10: Table of reports reviewed in the compendium of reports**

Reviewed reports	Year	Organisation
<i>Mapping Australian Science and Innovation</i>	2003	Engineers Australia
<i>Higher Education Review</i>	2008	Australian Government
<i>Venturous Australia: Building strength in innovation</i> (Cutler Report)	2008	Australian Government
<i>Management Matters in Australia: Just how productive are we?</i>	2009	Australian Government
<i>Powering Ideas: An innovation agenda for the 21st century</i>	2009	Australian Government
<i>Intergenerational Report</i>	2010	Australian Government
<i>Stronger, Simpler, Smarter ESOS</i> (Baird Review)	2010	Australian Government
<i>Internationalisation of Australian Science</i>	2010	Australian Academy of Science
<i>Australia in the Asian Century</i> (Henry Report)	2011	Australian Government
<i>Higher Education Base Funding Review</i>	2011	Australian Government
<i>Strategic Review of the Student Visa Programme</i> (Knight Review)	2011	Australian Government
<i>Karpin Report Revisited</i>	2011	Innovation and Business Skills Australia
<i>Australia's Productivity Challenge</i>	2011	Grattan Institute
<i>Australian Science in a Changing World</i>	2011	Australian Academy of Science
<i>Preparing for a Better Future</i>	2011	Business Council of Australia
<i>Productivity Policies: The 'to-do' list</i>	2012	Productivity Commission
<i>Negotiating our Future: Living scenarios for Australia to 2050</i>	2012	Australian Academy of Science
<i>Beyond the Boom: Australia's productivity imperative</i>	2012	McKinsey
<i>Game Changers</i>	2012	Grattan Institute
<i>Pipeline or Pipe Dream</i>	2012	Infrastructure Australia
<i>Health of Australian Science</i>	2012	Chief Scientist
<i>Skills for all Australians</i>	2012	Australian Government
<i>Excellence in Research for Australia: National Report</i>	2012	Australian Research Council (Australian Government)
<i>Australian Innovations Systems Report</i>	2012	Australian Government
<i>Smarter Manufacturing for Smarter Australia</i>	2012	Australian Government
<i>Sustainable Australia 2013: Conversations with the future</i>	2013	Australian Government
<i>Australia's Competitiveness: From lucky country to competitive country</i>	2013	CPA Australia
<i>Creative Australia: National cultural policy</i>	2013	Australian Government
<i>Funding Australia's Future</i>	2013	Australian Centre for Financial Studies
<i>National Infrastructure Plan</i>	2013	Infrastructure Australia
<i>Mapping Australian Higher Education</i>	2013	Grattan Institute
<i>Future Focus: National Workforce Development Strategy</i>	2013	Australian Workforce and Productivity Agency (Australian Government)
<i>Australia—Education Globally</i> (Chaney Report)	2013	Australian Government
<i>Critical Decade 2013: Climate change science, rises and responses</i>	2013	Climate Commission
<i>Australia Economic Survey</i>	2010, 2012	OECD

Source: Gupta 2013.

wellbeing, in order to integrate and frame their insights a little more, as indicated in Chapter 1.

A further issue is a certain parochial, introspective and self-referential tone to Australia's own reviews. The degree of international comparison and insight is more limited than might be expected. Likewise content is often that from common official sources, and limited use of external and global research especially independent peer-reviewed research, is a potential problem.

In relation to the framework developed for this study (Figure 1.2 above), some of the problem areas identified in both the international rankings and by the industry and public servants surveys receive a lot of attention in the political debate but very little in-depth study such as infrastructure, regulation and, at times, the environment. And while the public is happy to offer views on politicians and the workforce is happy to rate their managers, the issues of management and leadership have received negligible considered attention.

The things Australia does well are not looked at in detail and the nation may miss opportunities from a more profound study of why Australia's

culture is rated so highly and what it is that makes its cities good places to live.

These analyses of comparative advantage are insightful but cannot fully provide a sufficient comprehensive basis for long-term evidence-based policy development and implementation. They are largely selective and therefore not comprehensive. Nevertheless they are indeed, as indicated, a highly valuable resource as will be the various reviews and inquiries either recently completed or currently underway (Box 2.6).

## 2.4 Plausible scenarios for the future

### 2.4.1 Predicting the future

We cannot be certain what the future will bring for Australia. We cannot even predict it with any guarantees of accuracy. But we can have a look at what the future may bring and we do know the future we face will be one of uncertainty and complexity. Scenarios are a useful mechanism for pulling together the trends, issues, drivers and enablers that define our possible futures.

#### Box 2.6: Recent and current Federal Government inquiries

##### Recently completed and current Government inquiries

- Harper Review of Competition Laws (released March 2015)
- Intergenerational Report (latest released March 2015, five yearly update)
- Financial System Inquiry (report released December 2014)
- Energy White Paper (released April 2015)
- Taxation Reform White Paper
- Reform of the Federation White Paper
- Defence White Paper
- Agricultural Competitiveness White Paper
- White Paper on Developing Northern Australia

##### Productivity Commission inquiries

###### Completed 2014

- Childcare and Early Childhood Learning
- Access to Justice Arrangements
- Cost of Doing Business: Retail Trade Industry
- Cost of Doing Business: Dairy Product Manufacturing
- Natural Disaster Funding
- Australia's Automotive Manufacturing Industry
- Public Infrastructure
- Tasmanian Shipping and Freight
- Mineral and Energy Resource Exploration

###### Current inquiries

- Migrant Intake Into Australia
- Services Exports
- Workplace Relations Framework
- Public Safety Mobile Broadband
- Mutual Recognition Schemes
- Business Set-Up, Transfer and Closure

## 2.4.2 Scenario evaluation

The report, *Vision Australia: A Stocktake of Future Scenario Reports for Australia*, studied 25 different scenario reports at the global, national and industry level.

Almost all identified significant global trends and potential game changers that may influence the future that nations will have to contend with and which could drive national goals and policies into the years ahead. For example, in two influential future scenario studies, the CSIRO and the US National Intelligence Council (NIC) identified the trends listed in Table 2.11.

There are trends that are more specific to Australia's region where the immediate neighbourhood in Asia is fast becoming a centre of gravity for international commerce and competition as well as for geopolitical rivalries (update of the CSIRO scenarios is to be found in Hajkowicz 2015).

Additionally there are trends that are not confined to but have distinctive application for the Australian context:

- population ageing
- increasing cultural diversity due to immigration and urbanisation
- changing attitudes to work and family roles
- growing cities.

A synthesis of the 25 different scenario reports also identified some significant general drivers of future change (Table 2.12).

## 2.4.3 A plausible future

The purpose of looking at scenarios about the future is to begin to identify what some of the challenges might be and what some of the future possibilities might be without confining the discussion by assuming the future is simply going to be a repetition of the present.

The NIC again looked at a series of highly influential global scenarios that could affect any nation, see Figure 2.12.

All of these, or even elements of these, are plausible but we cannot know which of these scenarios or which parts of these will come to pass over the next few decades. We cannot know how these will directly affect Australia. But they do explain why the time ahead will be one of complexity and uncertainty. And they can start or drive a debate about how Australia makes itself flexible and adaptable enough to be able to respond to whatever future lies ahead.

All the NIC scenarios paint a picture of an interconnected world where some of the most important problems facing Australia are transnational and will require global cooperation to address them.

We have already experience of some of those in the threat of pandemics (N1H1, Ebola), attempted coordination of a global response to environmental challenges/climate change, cybercrime and cross border tax arbitrage by individuals and corporations. What is clear from the experience so far is that multilateral solutions take time and finding consensus where each nation is also looking after its own interests is challenging.

**Table 2.11: Mega-trends and game changers**

Mega-trends/global trends	Game changers
Increased global connectivity and awareness, brought about by the ICT revolution	Entrenched bilateral conflicts, driven by ethnic and nationalistic differences and geopolitics
Increased diffusion of power to non-state actors	Governance gaps
Rise of Asia	Global financial and economic volatility—inequality and future of globalisation
Rising global population	Large scale terrorist attacks using hacking, WMDs, or nanotechnology-based weapons
Increased pressure on food, sanitation, energy, employment and quality education	
Global production sharing with value chains split across countries	

Source: Gupta 2013.

Table 2.12: General drivers of future change

Driver	
Social and cultural	Covered a range of areas including health, learning, personal security, degrees of influence
Economic, business and financial	Covered a range of factors depending on the scope of the scenario
Sustainability and the environment	A broad range of environmental issues/threats, often related to energy, water and urbanisation
Demographics, particularly population issues	Usually population growth and ageing population
Climate change	A common driver in many scenarios, defined variously
Government structures, processes, policy and efficiency	Many scenarios were developed by government departments, or governments were the target audience
Geopolitics	Regional security, shift in wealth and allegiances, role of the US, rise of China
Digital connectedness	Collaborative consumption, micro-transactions, disrupted business models, virtual crime, cyber security
Science and technology innovation	A major driver, not present in all scenarios
Infrastructure in cities	Housing, energy, transport

Source: Centre for Australian Foresight 2014.

Figure 2.12: Global scenarios

Global scenarios	
Scenario 1: Stalled Engine	Scenario 2: Fusion
<p>Most plausible worst-case scenario</p> <p>Interstate conflicts due to geopolitics</p> <p>Weakening of the multi-lateral system</p> <ul style="list-style-type: none"> <li>Hyper-partisan politics in the US</li> <li>Economic crisis in Europe leading to long-term recession and unravelling of the Eurozone</li> </ul> <p>Slowdown in China reduces resources demand</p> <p>Large refugee flows due to global violent conflicts</p> <ul style="list-style-type: none"> <li>Ethnic tensions spill over in Australian communities (author emphasis, adaptation of NIC report)</li> </ul>	<p>Most plausible best-case scenario</p> <p>A multi-polar world led by China, Europe and the US ensure global security and growth</p> <ul style="list-style-type: none"> <li>Political reforms in China and North Korea</li> <li>Stability in the Middle East</li> </ul> <p>A strong multilateral system finding solutions to global challenges</p> <ul style="list-style-type: none"> <li>Crime, climate, pandemics</li> </ul> <p>Advanced technologies address resource constraints and create new opportunities</p> <p>Global trade results in equitable income distribution and social cohesion</p>
Scenario 3: Gini out of the bottle	Scenario 4: Non-state world
<p>A world of extremes</p> <p>Trade imbalances and income inequality lead to domestic and international tensions</p> <p>Resource-dependent countries fail to diversify</p> <p>Energy independence in the US renews its unipolar dominance and restructures geopolitical dynamics</p> <p>Environmental sustainability compromised in a quest for growth</p>	<p>Diffusion of power to non-state actors</p> <ul style="list-style-type: none"> <li>NGOs, think tanks, multinational corporations and influential individuals</li> </ul> <p>A hyper-globalised world, with non-state actors driving the agenda on major problems; a 'patchwork' of coalitions undermine national boundaries and multilateral arrangements</p> <p>Access to lethal technologies and biological weapons causes panic and disruptions</p> <p>Soft power more potent than military power</p>

Source: Centre for Australian Foresight 2014.

That means there will be elements of the future that are outside the control of national policymakers or national business leaders. The potential for increasing involvement of non-state actors such as multinational corporations and organisations, the media and non-government organisations to have increasing influence over negotiations and outcomes could further diminish the extent to which national governments control the solutions to problems.

As already noted earlier in this chapter, some of these potential risks are already in the minds of business and policy makers to some extent at least (2.2), although many of them do not feature in the reviews/in depth analysis conducted by governments and institutions in recent years (2.3).

### 2.4.5 Prediction lessons

What is clear from the analysis of scenarios is that there are no right or wrong answers to the question of what lies ahead of us. But scenarios do need to look at the whole system rather than focusing on one area or one possible future.

There are though some pitfalls to avoid in considering the different scenarios, as seen in Figure 2.13.

#### Summary

There is no perfect way to try to gaze into the crystal ball and predict what future Australia will face nor how it should face it. But some of the lessons provide a valuable foundation for beginning the task of looking at what possible future or futures lie ahead.

A willingness to consider many different scenarios helps begin the task of evaluating what the unknown might look like and anticipating clearly the breadth of tools Australia will need in its toolkit to respond (Figure 2.13).

## 2.5 Conclusion

The key to successful building for the future is getting the foundations right. The surveys and reports studied in this chapter for the Australia's Comparative Advantage project show that in some areas the foundations are not as good as they could be.

One of the most important foundations is education. Australia is doing reasonably well compared to other countries but the perception at home and through some global benchmark outcomes is that the system is not performing as well as it could be. Certainly improvement and enhancement is always possible.

Australia is innovative but could do much more to develop innovations. One part of that puzzle could be building better and stronger links between the education system and business to ensure the system that delivers skills and ideas works with industry that builds on those skills and ideas. Industry and the public service could also do more to not only understand each other but share different perspectives on what challenges and risks Australia faces and how best to meet those. The nation's record on infrastructure is also good but mixed, so that more could be done.

The country has many strengths but why and how the strengths came to be so is rarely looked at both for how to ensure they endure in times of more complex risks and for learning why they came to be strengths and whether the lessons can be applied to other areas. Immigration is a case in point.

In studying what Australia does well and what it can do better, there also needs to be a more holistic and evidence based view both of the scale and scope of the possible risks and opportunities in the future and what can be done to deal with them. Building a successful future will take many elements and it will be critical to ensure the elements are as strong as they can be and work together as well.

**Figure 2.13: Scenarios design principles**

#### **Quantitative and qualitative data**

The Food Security report was a good example of how narrow a scenario project can become if it relies exclusively on quantitative data modelling to generate the scenarios. The Australia 2050 report was a good example of a deep and broad scenario development process that took advantage of the power of both quantitative and qualitative inputs to produce high quality outcomes. The message here is not to privilege any one form of data in scenario planning projects.

#### **Systems perspective**

A narrow focus in a scenario project may enable very focused recommendations for action today to be developed. The risk, however, is that the drivers of change considered to create the context for the scenario development are confined to those with a direct impact on the topic. The potential result is that when change occurs outside those drivers, the agreed actions will no longer be relevant or useful. A systems perspective is essential in scenario work to take into account the interconnected and interdependent change 'ecosystem' and ensure a robust understanding of possible future outcomes is achieved.

#### **Challenging assumptions**

The individual scenario report assessments analyses cite several instances of assumptions that have not been challenged during the scenario building process. This inevitably produces scenario outcomes that are more of today rather than addressing possible and alternative futures. Humans are prone to a number of cognitive biases when it comes to thinking about possible futures, and we tend to believe that the future will essentially be more of today. Not challenging assumptions and their underpinning biases means that scenario project outcomes are likely to be flawed and become irrelevant as soon as the world changes.

#### **Seeking alternative futures**

Good scenario work produces a range of distinctively different future worlds within which particular strategic issues or questions can be explored. There is never a single, linear future. Rather there is a range of possible, alternative futures than can be analysed and interpreted to identify both future change drivers likely to affect an organisation and possible strategic responses. This is why at least four scenarios are preferable to avoid the good/bad scenario set or the no change/some change/radical change scenario set that do not generally provide enough differentiation to challenge the thinking of participants. Seeing possible—and plausible—alternatives is essential to generate new, innovative ideas that prepare participants and their organisations for change in the future.

#### **Participatory processes**

The choice about whether or not to include a broad range of participants in scenario work is one that is usually based on cost, resources and time available. Wherever possible however, a wide range of stakeholders should be included in scenario work from the beginning of the project, as opposed to asking them for feedback on prepared scenarios. Stakeholders are critical 'players' in the implementation of scenario project outcomes and cannot be expected to be involved in implementation of those outcomes if they are not provided opportunities to have their say in the shaping of the scenarios themselves.

#### **Seeking outcomes that both pull and repel**

When developing scenarios, it is often easy to identify those aspects of the future that appeal to participants and that pull them into a preferred future. This is important since these aspects will form part of a shared vision for an organisation or government, and can represent strategic opportunities. Elements that cause a repelling reaction among participants are also necessary, since the future will consist of more than positive change. The ability to identify those aspects of a future that participants do not want is a critical part of scenario development in strategic decision making, and these elements can form part of an organisation's risk management plan and its scanning program to develop contingency plans and to monitor the evolution of those risks over time.

#### **Connect the future with today**

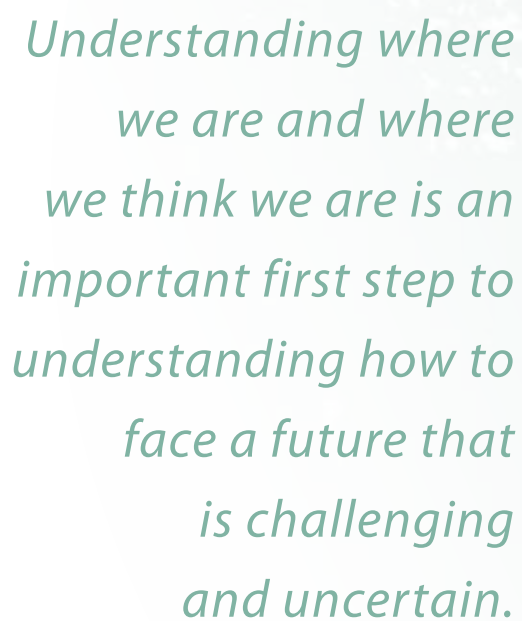
Many of the scenario report reviews suffered from the gap that is common to many such projects—a failure to connect the exploration of alternative futures with today's strategy development. It is this lack of an overt connection of potential strategic actions with today's strategic processes that undermines the value and utility of scenario work in practice. This lack of connection is clear because very few reports reviewed identified strategic actions to be considered today. One way to avoid this gap is to be very clear about not only the purpose of the scenario project, but also how the outcomes will be integrated into existing strategic processes, whether at organisation or government level. If this proposed integration is clear, participants will know how the outcomes will be used and the project will avoid being relegated to the realm of 'nice but useless in practice'.



## 2.6 Findings

- Australia has many notable strengths, particularly in its low corruption and high quality of living (especially in the large cities), basic research, and human development. However, there is insufficient policy attention given to how to maintain and enhance these strengths, or what emerging challenges could undermine these in the next few decades. There also appears to be little attention given to what lessons could be drawn or how their success could be emulated in other areas. Commissioned reports have too often been narrow and piecemeal and the reasons for and lessons from areas that are Australia's strengths appear not to have been the subject of in-depth study.
- There are weaknesses perceived in some of the drivers of comparative advantage such as the commercialisation of innovation, education, infrastructure development, environmental sustainability, and both the burden of government regulation and access to finance to allow industry to take risks are seen as concerns. Public leadership is perceived as lacking by business and policy sectors, as well as foreign business executives who deal with Australian companies. These are significant areas where much improvement is needed. The awareness of global or other country directions is weaker than might be expected in government/public service. Also the dominance of single paradigm approaches to policy e.g. neoclassical economics, is seen by some as inhibiting more robust policy development and insight.
- Australia will face a challenging and complex global environment with strong global competition in some of Australia's strongest industry sectors. Considerable uncertainty exists, as shown by the project's scenario analysis. The strategic ecosystem in the 21st century will be characterised by complexity and diffusion of power. Policy should aim for robustness and flexibility, resilience and nimbleness. Assumptions of certainty will breed rigidity. Power and responsibilities will have to be better divided, and resources and skills will need to be adequately provided such that each level of government can handle its particular problems.
- There are problems with leadership both at the industry and government level and the awareness of global or other country directions weaker than might be expected in government/public service
- There is need for a common discourse on Australia's future. Yet considerable gaps exist between the views of the business and public sector. Given the common calls for greater partnerships and collaborations between the various sectors of the economy, this raises concerns. Moreover, the survey results show that these sectors attach importance to issues they normally deal with, and do not attach adequate importance to trends such as pandemics, environmental damage, and people movements which are away from their responsibilities. Likewise, how to allow for the 'unknown unknowns' remains a major challenge in constructing a resilient policy domain.





*Understanding where  
we are and where  
we think we are is an  
important first step to  
understanding how to  
face a future that  
is challenging  
and uncertain.*

# 3

## Sectoral dimensions of Australian performance

### Introduction

From riding on the sheep's back to surfing the crest of the mining boom, Australia has taken advantage of its wealth of natural resources and it is further created advantages to build its strong economic foundations and cement its position in the international marketplace. However, it cannot take the factors that have contributed to its comparative advantage for granted. This chapter examines the agriculture, mining, manufacturing and services sectors that make up the bulk of Australia's economy in terms of GDP, exports and employment.

ACA commissioned comprehensive reviews by leading business groups PricewaterhouseCoopers (PwC) and ACIL Allen Consulting to determine the performance of Australia's mining sector (PwC 2014a), and its agriculture and services sectors (ACIL Allen Consulting 2014a; 2014b). This chapter also includes insights from the 2014 report on *Advanced Manufacturing: beyond the production line*, (Roos 2014) as well as the ACOLA report on the *Role of Science, Research and Technology in Lifting Australian Productivity* (Bell et al. 2014).



There are of course a range of views in the community on the strengths and weaknesses, opportunities and risks of the sectors presented in this report, as seen in Chapter 2. However, this report relies primarily on the advice provided in the reports commissioned by ACA. These authoritative reports found consistent risks and opportunities facing these key sectors of the Australian economy. All considered the steps necessary to maintain and grow Australia's comparative advantage in these areas in order to ensure our continued prosperity.

According to these reports, in mining, Australia is predominantly focused on extracting and exporting and the same could be said for agriculture with its focus on commodity exports. An inward focus in the services sector is meeting the growing needs of Australia's domestic population but is not capitalising on the expansion of the middle class in the booming Asian region. While in manufacturing, the focus needs to change from industrial to functional specialisation to take advantage of vast global value chains.

As also seen in Chapter 2, Australia faces uncertainty and complexity in the global economy but the challenges can also be opportunities. There are prospects in building a culture of high value-adding and technological innovation across sectors and particularly in advanced manufacturing and agriculture. Despite the buffeting the mining industry has received from a fall in global prices and a tempering of demand, there are opportunities there too for high value-adding and for selling Australia's expertise to the world.

But growth in these industries, and the burgeoning services sector will depend on dealing with some of the gaps already identified in Chapter 2. These include building skills and knowledge both in the science, technology, engineering and mathematics (STEM) fields and in complementary skills in humanities and social sciences (HASS) to help societies adapt to and adopt new products and services.

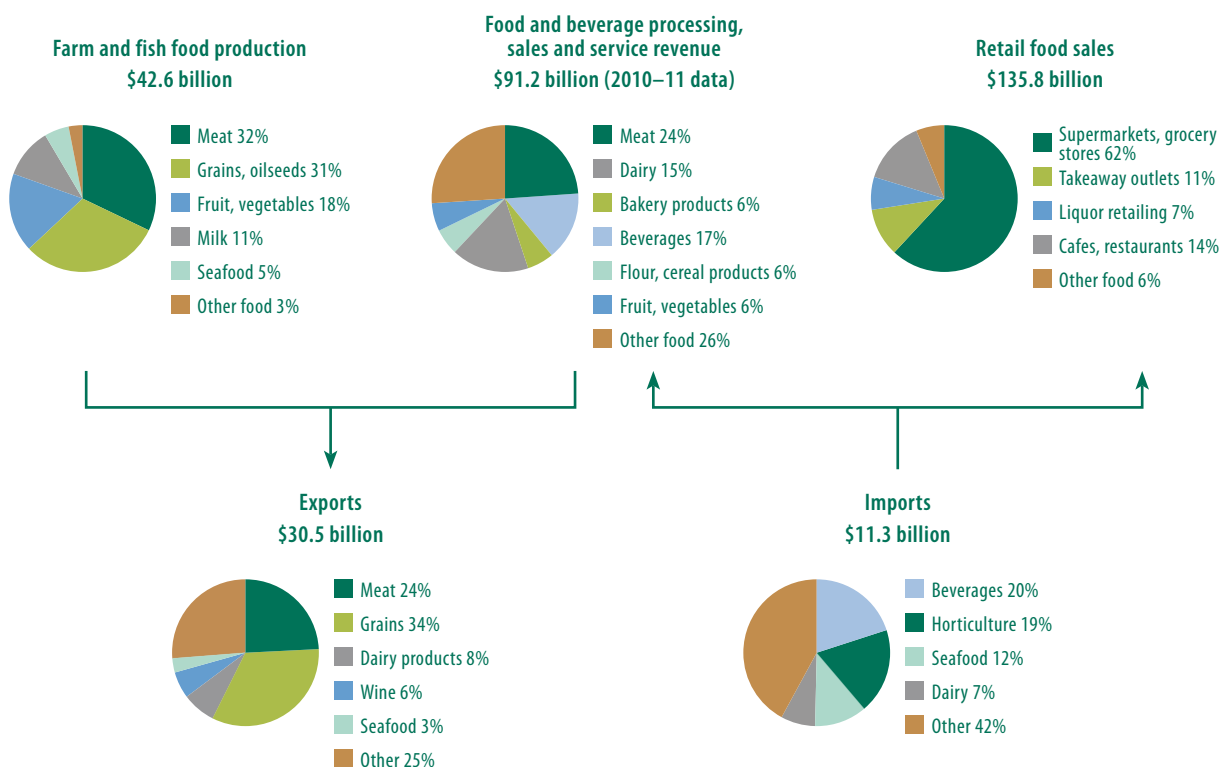
There also needs to be more collaboration across government, academia and industry in both workforce development and research and development (R&D) to help build skills

and drive the innovation needed to underpin the value-adding that will help fuel growth. Improved productivity, access to finance and better regulation are also necessary to assist this growth. The common drivers of growth across the different sectors highlight that a broad approach to building comparative advantage will be necessary as a foundation to prepare Australia to thrive in whatever future lies ahead.

### 3.1 Agriculture

Agriculture is one of Australia's oldest and most important sectors. Its value to Australia's social and economic wellbeing as well as to its long-term comparative advantage cannot be overstated, and yet agriculture's relative contribution to the Australian economy has steadily declined over the past century. While this can be attributed in part to a long-term decline in agricultural terms of trade and an increase in global agricultural production, significant causes are also structural and systemic. This section draws on a comprehensive review of the agricultural sector, completed by ACIL Allen

Figure 3.1: Value chain for food in Australia



Note: Represents the value chain in 2011–12, farm value excludes non-food production.

Source: Commonwealth of Australia 2014, citing *Australian Food Statistics 2011–12*, Department of Agriculture, Fisheries and Forestry, Canberra.

Consulting for this project and it complements the separate *Securing Australia's Future* project on agriculture. It has sought to identify the contexts and policy settings that would ensure the future competitiveness and sustainability of the sector.

Australia's agriculture sector contributed \$45 billion in total to the economy in 2011/12. Figure 3.1 shows how Australia's multi-billion-dollar farm and fish production sector is value-added to create \$91.2 billion processing and \$135.8 billion retail sectors. Agriculture produces an additional \$2.23 billion of cotton and \$2.7 billion of wool fibres that are predominantly processed overseas.

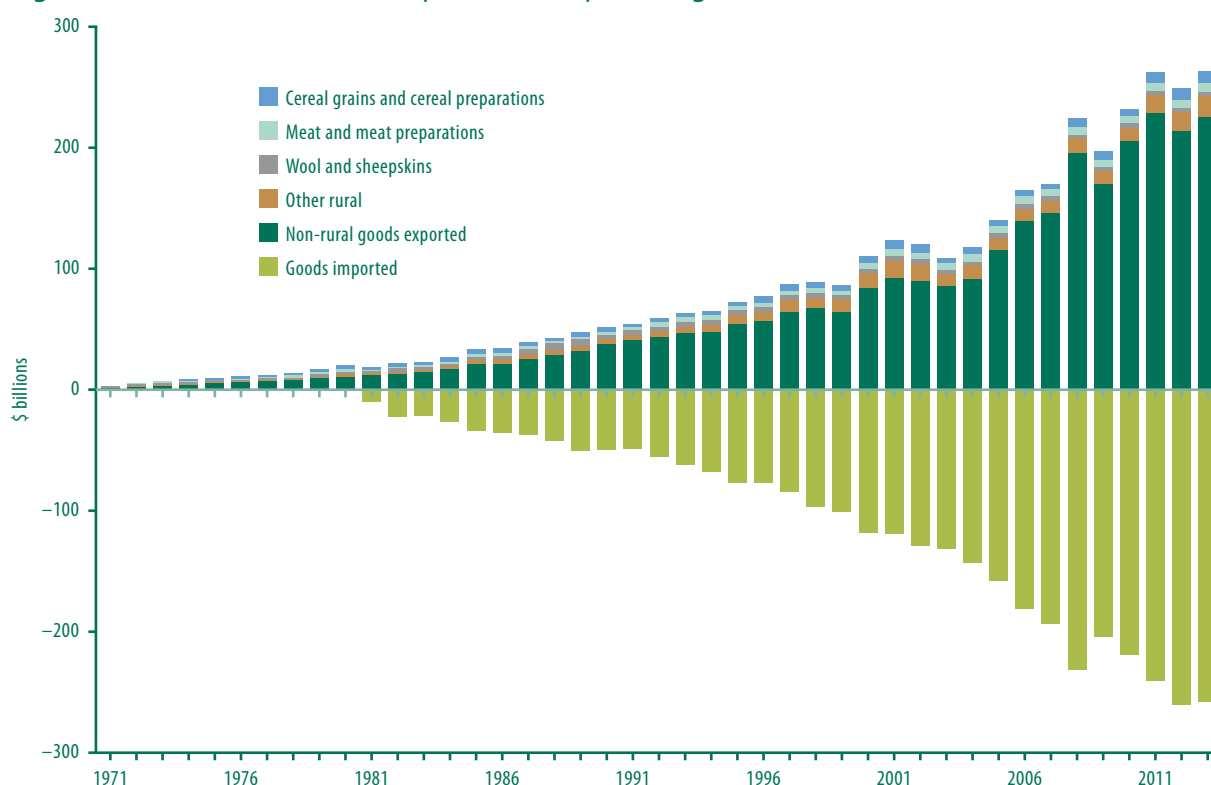
Australian agriculture's success since World War II has been based on growing produce that people want and a strong pursuit of productivity from a sound natural resource base. Changing consumer preferences, slow trade reform and the emergence of global competition have changed this point of difference. The future success of agriculture depends on growing not only what people want, but growing it better than other producers.

The ability to produce a diverse range of food and fibre is not a source of comparative advantage

in itself, despite the fact demand will increase in line with domestic and global population growth. Australian agriculture must offer commodities at globally competitive prices or differentiated products on the basis of quality. As ACIL Allen note the prices for bulk commodities, from agriculture, mining or any other sector where Australia has a comparative advantage, will decline in real terms. This is because no single country has ever been able to continually either corner a market or extract monopoly rents from a commodity. As Figure 3.2 demonstrates, Australia's trade in goods continues to grow in value but its share of rural goods as a proportion of total goods declined from around 32% in 1983 to 14% in 2013.

As for many other developed countries, agriculture's relative contribution in Australia has declined during the past century as other sectors in the economy grew and global agricultural production increased. It is notable that total factor productivity growth is now at a low level vis a vis countries such as the US. However in recent times, there has been a shift in perception from agriculture being a sunset sector to one of renaissance in light of growing global demand,

**Figure 3.2: Value of Australia's exports and imports of goods, 1971–2013**



Source: ABS 2014a.

especially in Asia. This has led to a renewed interest in understanding the basis of Australia's comparative advantage in agriculture in order to identify opportunities for businesses and to strengthen government policy.

Australia is a net agricultural exporter, with around 60% of all products exported. Although geographically isolated and reliant on extensive infrastructure to move commodities, it is well placed to take advantage of the growing domestic and global demand for food. Figure 3.3 shows Australia is a strong exporter of commodities compared to the rest of the world. In particular, Australia dominates the wool market with 80% of Australia's wool exports destined for China.

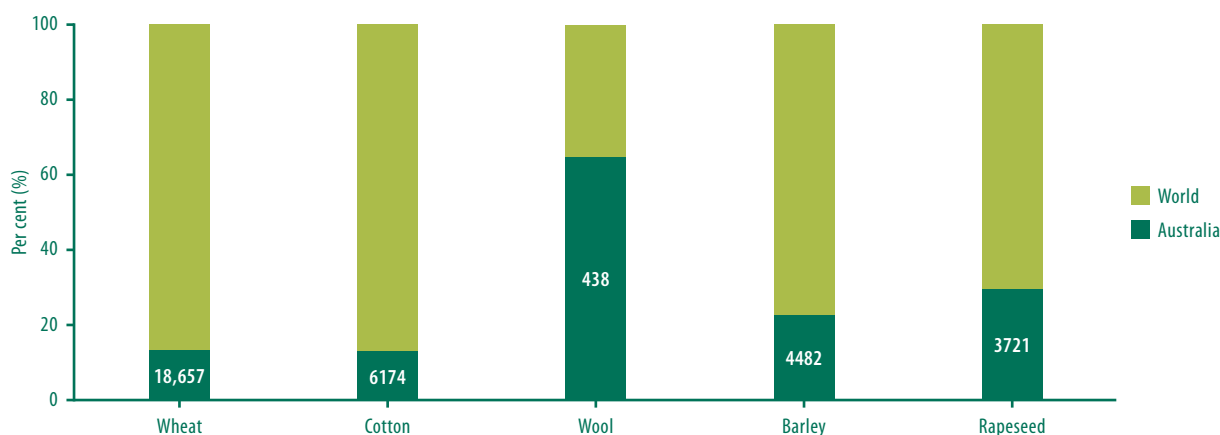
The demand for agricultural goods will increase through population growth and rising standards of living in Australia and overseas. Australia's agriculture sector has a diverse base to service this demand. However, productivity gains will be crucial to offset continually declining terms of trade for commodities and to ensure differentiated and high value-added goods are competitive in the global market. Global drivers affecting agriculture are highlighted as follows:

- Strong population growth, with continued urbanisation of that population: in Australia alone, population is projected to increase by 52% by 2050.
- Significant climate change effects: at the very least, this will require the development by modern biotechnologies of new types of seeds that can survive with less water, higher

temperatures, and different soil conditions, including gradual erosion of the topsoil.

- High price volatility: this would undermine long-term planning.
- Significant shortage of skilled labour: the sector will need workers who can handle and maintain complex equipment, and who can manage large farms remotely. Precision agriculture and the associated technologies, processes and capital equipment are central here.
- A significant requirement for increased scientific and technological R&D: science research is the backbone of a successful and sustainable agricultural sector, from new types of seeds to new types of machines. Moreover, the sector is such that it demands public investments, since the amounts required are often beyond the scope of individual farms.
- Changing cultural preferences and changes in eating habits: an example is increasing demand for more organic-type foods that are grown in cleaner, less polluted places. There is also an increasing emphasis on a more humane treatment of animals. These higher quality foods command higher prices on global markets, particularly in Asia.
- Increasing demands for sustainability and environmental stewardship: this is closely related to the point above about changing preferences. Increased agriculture should not lead to soil erosion, nutrient depletion, etc.

**Figure 3.3: Australia's exports of selected grain, fibre and oilseed, 2012/13**



Note: The numbers in the teal (bottom) stack represent the total '000 tonnes of produce exported by Australia. Cotton is measured as '000 tonnes of 480 lb bales.

Source: ABARES 2013; USDA 2014.

Despite its favourable reputation in global markets, Australian agriculture faces significant challenges to growing the sector in the future including:

- increased international competition
- a commodity rather than a value-added focus
- decline in public spending on R&D
- low rainfall and lack of irrigation infrastructure
- cost effective finance for businesses
- lack of infrastructure in northern Australia
- critical shortage of skills and labour
- relatively low returns on investment with long payback times.

These global trends reflect significant opportunities for Australia, but also help to highlight the current strengths and weaknesses of the sector.

### 3.1.1 Australia's comparative agriculture advantage

In preparing its report, ACIL Allen Consulting noted that comparative advantage is not a singular concept but is based on a number of elements that must be brought together to provide advantage. Moreover, comparative advantage is relative and changeable, and highly influenced by current and future drivers of change. Industry and government need to adapt in an integrative and ongoing process to continually improve and evolve agriculture. Two recent significant reports, the National Farmers' Federation's 2013 *National Blueprint for Australian Agriculture* and the Australian Government's 2014 *Agriculture Competitiveness White Paper*, reflect the increasing realisation of the sector's strategic importance, and call for policies that will help make it profitable, productive, sustainable and competitive.

The ACIL Allen report explores five elements that are commonly cited as the basis of Australian agriculture's comparative advantage:

- Australia is an established player that can satisfy both global and local demand.
- Australian farmers have in the past been considered highly productive with R&D a key driver of productivity.

- Australia has a diverse range of agro-ecological zones that allow production of many types of agricultural products.
- There is extensive water and transport infrastructure in existing agricultural regions.
- Australian agriculture is relatively pest and disease free and has a favourable global clean and green reputation for its quality output.

Australia's agriculture sector has the ability to leverage its capability and brand to meet the nutritional needs of a growing population domestically and in Asia, and to create greater value-added products and product differentiation. However, its current commodity rather than value-added focus is a significant weakness.

Australian farmers have long been considered highly productive and amongst the most self-sufficient by world standards. Australian agriculture has low levels of protection and other trade-distorting support provided by government, which has forced farmers to find innovative ways to increase production and reduce costs. According to OECD evidence cited by ACIL Allen, as demonstrated in the figure below, Australian farmers received low levels of financial support of 2.7% (as a percentage of gross farm receipts) in 2012. This compares favorably with the other countries shown in Figure 3.4 which average 26.4% or a quarter of gross farm receipts.

Australia has a sophisticated rural R&D model, which has been highly effective in driving productivity growth and enjoys a high level of public support. However there are concerns about a decline in public spending and how the sector is organised and regulated. Federal and state funding accounts for more than three-quarters of all agricultural R&D spending in Australia. Public spending growth on R&D has declined in the past few decades, from an average annual growth of 6.5% p.a. during 1953–80 to only about 0.6% p.a. during 1980–2007 (Sheng, Mullen & Zhao 2011).

Given the smaller absolute size of agricultural R&D in Australia, it is also critically dependent on international research spillovers. Therefore an ability to innovate must be complemented



by absorptive capacity and an ability to adopt, adapt, and apply global innovation and best practice. There must be a greater focus on creating international linkages to drive access to research, advanced farm inputs and operating practices. While there is support from government to strengthen the R&D model, public funding must be complemented in turn by multi-dimensional, multi-level diplomacy driven by governments, the private sector, and academia.

The agriculture sector is facing a decline in employment numbers. ABARES data shows the number of people employed in agriculture has reduced by an average rate of 1% per annum over the years 1975–76 to 2012–13, while at the same time the average rate of farm gross product has increased by 3% (ABARES 2013). ACIL Allen attributed the reduction of total labour inputs to unfavourable climatic or market conditions, substituting labour for technology and limited access to migrant labour. The latter two are important to Australia's comparative advantage given that, as a developed country, labour costs are higher than in many competitor countries with access to cheap migrant labour such as the United States or Canada (Nossal & Sheng 2013). This should form a basis for rapid technology adoption with consequent faster productivity growth.

Australia's diverse range of agro-ecological zones allows the production of many types of agricultural products which has contributed to its natural comparative advantage. However only about 3% of its 761 million hectares of available agricultural land is currently used for cropping

and horticulture due to its long-standing problem with low annual rainfall and access to water for irrigation (Keogh 2012). The remaining vast areas of arid and semi-arid land are best suited to extensive grazing of cattle and sheep on native pastures (Figure 3.5).

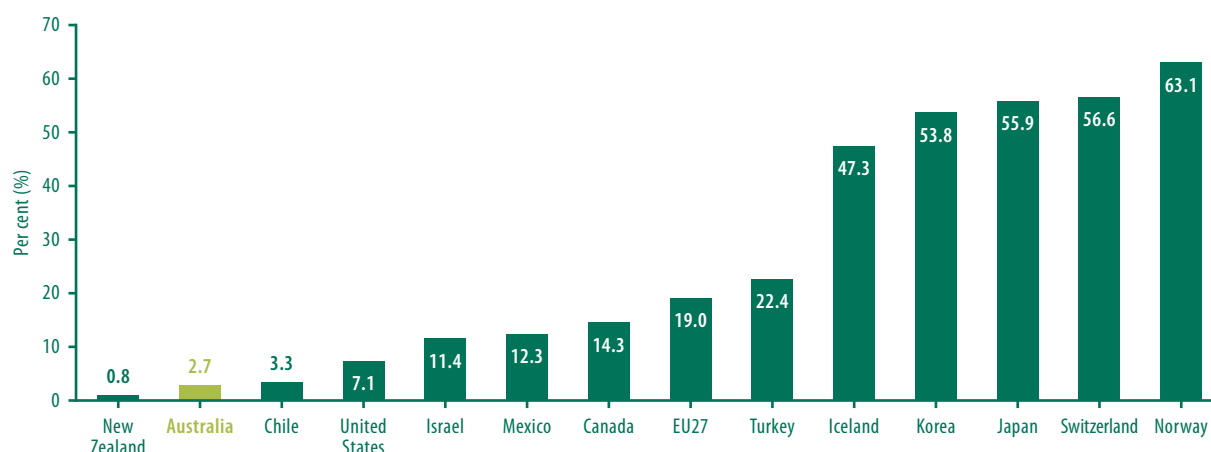
Australian agriculture's pest and disease free status provides a clear advantage in access to global markets. This is further enhanced by its clean and green reputation, which is driven by the unpolluted nature of our pasture lands as well as by the traceability and accountability of products. The National Livestock Identification System for livestock and the Maximum Residue Limits for chemicals in grains are notable examples. Australian farmers also enjoy a good reputation for the great effort and expense they undertake to care for the land under their stewardship.

### 3.1.2 Where to now?

The ACIL Allen report identified three main ways in which Australia could expand its supply capacity:

- farming new areas of land (this would require public investments in irrigation, energy, and transport infrastructure)
- swapping out of low input, low production systems into high input, high production systems (requiring new management skills, access to finance, and competing for land against higher value mining and coal-seam gas sectors)

**Figure 3.4: Producer support estimates, as a percentage of gross farm receipts, 2012**



Source: OECD 2013a.



- producing more from less by increasing water use efficiency (role for increased R&D) or driving innovation-based productivity e.g. producing smarter things in smarter ways which leads to higher value-adding and potentially longer value chains with other benefits.

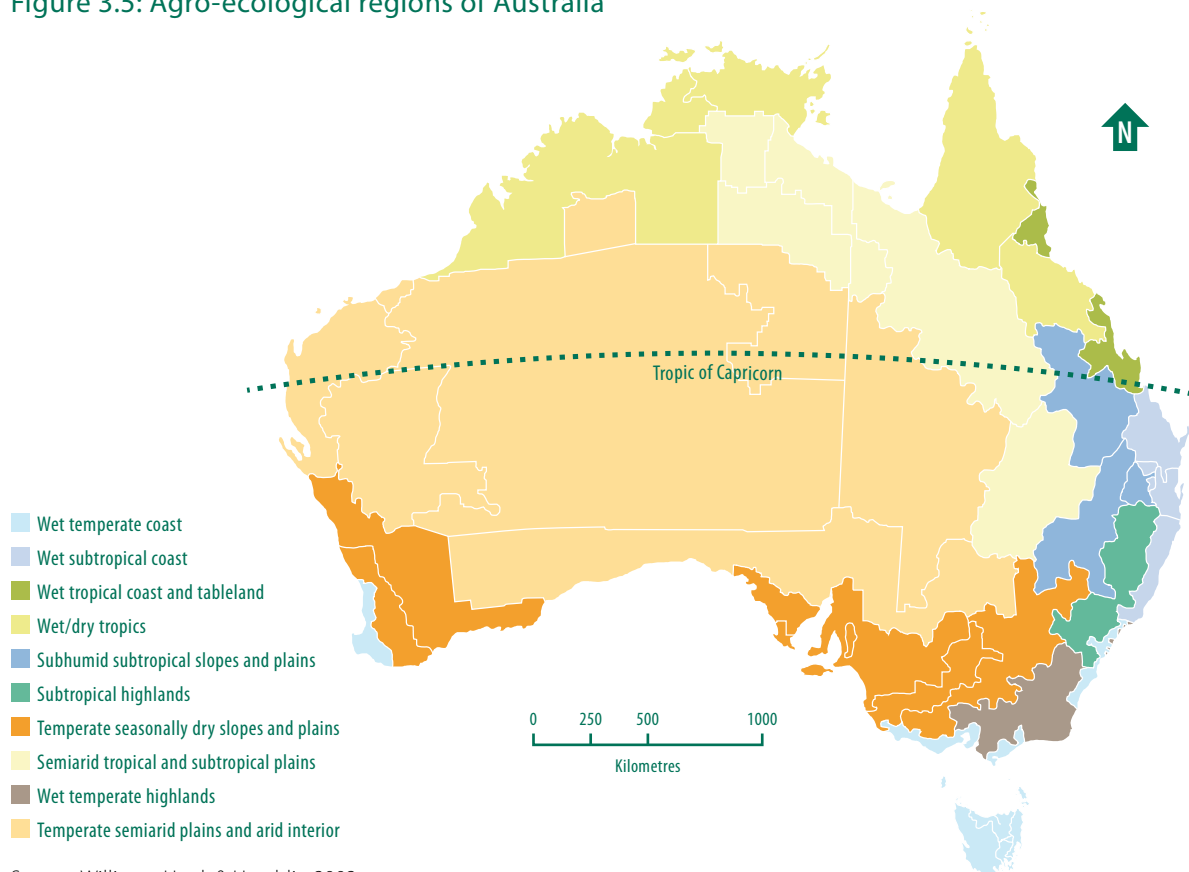
Access to adequate financing is critical for the growth of operations and for managing the operational risks associated with a variable climate and water supply. The majority of Australian farming businesses are financed by families using their accumulated capital (mainly land) as collateral for loans from banks. The report identified a need for innovations in farm financing to alleviate some of the constraints in financing. One possibility in this space, also canvassed for some other areas in this report, is wider use of Australia's distinctive income contingent loan system, as deployed in higher education (Botterill & Chapman 2009).

With regards to infrastructure, Australia already has extensive water and transport infrastructure in existing agricultural regions. It also enjoys a relative advantage over developing countries in long-distance-based freight technology.

However, there is a notable lack of infrastructure in the north, and ageing infrastructure elsewhere. Addressing this would require substantial technological, skills and financial commitment.

While Australian agriculture enjoys a favourable global reputation for its quality output, its reputation within the domestic context is plagued by a negative image and a well-documented shortage of critical skills and labour. This is at a time when the industry's prospects have never been better. The negative image arises from the fact that employment in the sector has fallen over the past 30 years or so even as the total employment in the economy has grown by more than 50%. This creates a perception of poor employment and growth prospects within the sector, which in turn reduces the number of people opting for higher education and training in it. Absence of clear and defined career pathways and inter-industry labour competition further exacerbate the problem. Furthermore, despite agriculture's role in shaping the national identity, agriculture alone is not sufficient in sustaining regional communities.

Figure 3.5: Agro-ecological regions of Australia



Source: Williams, Hook & Hamblin 2002.

There is an urgent need to create a national narrative and discourse around the favourable prospects of the sector, which then needs to be demonstrated through favourable outcomes for new graduates. While domestic interest in the sector is waning, global interest in the sector (particularly for investments) is on the rise due to Australia's sound legal and institutional frameworks. A reinvigorated focus on skills, infrastructure and innovation seem the key elements for a future building on Australia's natural advantage and long record of contribution in this area. Sectoral leadership and a capacity to link to challenges in areas that impinge on agriculture, such as environmental and mining pressures, will be crucial.

The ACIL Allen report also emphasised that a project under the broader *Securing Australia's Future* program, entitled *Australia's Agricultural Future* was underway at the time of this report's drafting, and will be considering some of the issues highlighted here in more detail.

## 3.2 Mining

The mining industry has been a leading contributor to Australia's economic growth and international impact including in the past two decades especially. But despite its impressive contemporary performance, important

weaknesses and potential threats to the sector have been identified. These point to a need to reduce reliance on mining as the single most strategically important sector underpinning the Australian economy in the future. The dimensions of this challenge have been documented for this report in the study from professional services firm PwC prepared for this project.

The mining sector in Australia is not only large in terms of ores extracted and mined, but is also part of a larger value-chain industry that comprises processing, exports, and associated services. The sector is Australia's largest export earner, accounting for 50–60% of total exports of goods and services. It is also one of the largest contributors to the national economy, with mining investments accounting for about 7.7% of gross domestic product (GDP) in 2012. The findings highlighted in Table 3.1 suggest that Australia's mining industry is largely an 'explore, extract ores, produce metals and export' sector, but with a significant supporting service sector.

The mining industry in Australia is export-oriented, with exports expected to account for more than 65% of revenue in 2013. This compares to 50% to 60% growth in minerals, implying a higher export performance for downstream activities. Performance depends on global trends in supply and demand for commodities. Revenue was \$244.4 billion in 2013 and is expected to grow at a compound annual rate of 3.8% over the next five years (Ibis World 2013).

**Table 3.1: Australian mining sector, size and growth**

Sector	Revenue 2013 (\$B)	Growth in revenue (% p.a.)	Comments
Mining extraction	90.3	4.3 from 2012 to 2017	Ore mined
Mining extraction and metals production	121.9	11.0 from 2011 to 2016	Ore mined, and production of metals such as aluminum, iron, steel
Minerals and ore exported	130.0		Iron ore \$82.1 billion, metallurgical coal \$23.7 billion, thermal coal \$17.2 billion
Oil and gas	56.0	16.0 from 2013 to 2018 production (supply) 9.0 for industry sales (demand)	37% of the volume of gas produced is exported
Mining, and oil and gas, including extraction, production and services	244.0	3.8 from 2013 to 2018	Includes mining, oil and gas, iron smelting and steel manufacturing; fossil fuel electricity generation, gas supply; electricity, gas, water and waste services; wholesale trades who provide access to machinery and provide equipment; business services; and integrated logistics

Source: PwC 2014a.

Australia also has significant gas resources with around 3.8 trillion cubic metres of gas with total gas production in 2012/13 estimated to be 59 billion cubic metres. Coal has historically dominated the power sector. However gas has grown in the past decade and now represents 21% of Australia's energy supply (BREE 2013). According to PwC, industry performance is expected to improve dramatically over the next five years from 2013 in response to rising production (especially natural gas) and higher prices for oil and gas, subject to global CO<sub>2</sub> limitation agreements. Increased investment in the industry will support rising output. Australia also has a longer-term opportunity to exploit shale gas as concluded in a study by ACOLA. The report notes that 'shale gas has the potential to be an economically very important additional energy source'.

Mining investment in Australia increased from 1.5% of GDP in 2002 to 7.7% in 2012 on the back of the soaring demand from China. It peaked by end of 2013 and there are predictions that it will fall below 4% of GDP by 2023 (Deloitte Access Economics 2013; Lowe 2013). The future prospects of Australia's most important export earner are highly dependent on both export prices and growth prospects in Australia's largest trading partners particularly Asia, but neither of these are in Australia's direct control. Such dependence on a single industry and exogenous factors is a major strategic weakness that Australia will need to contend with, especially demand development in China.

Despite its impressive size and value to the economy, the sector faces challenges including:

- a decline in mining investment
- a global decline in commodity prices
- falling domestic productivity
- growing costs including increased regulation and taxes
- skills shortages and knowledge gap.

### 3.2.1 Australia's comparative mining advantage

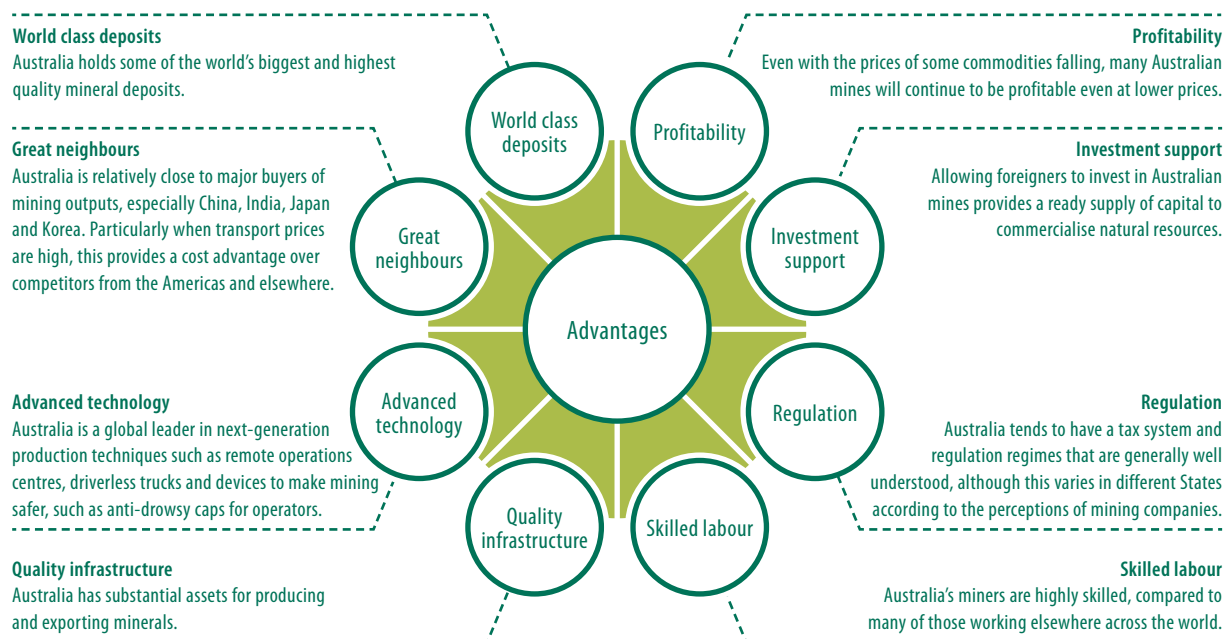
Resource-rich countries have comparative advantages endowed by nature, but these advantages can only be maintained by moving up the value chain. Australia is amongst the world's top ranked countries in terms of Economic Demonstrated Resources (EDR) with research suggesting that Australia's EDR of a number of minerals (such as iron ore) are the world's largest.

PwC notes that for the past decade the resources boom has been driven by the combination of Australia's comparative advantage and high growth in Asia (particularly China). A number of organisations acknowledge that mining will remain a major contributor to the Australian economy due to factors such as large economic sources of mineral resources and a growing and large market in Asia. Research indicates that Australia will continue to win a large share of the international growth in demand for minerals due to reasons such as those outlined in Figure 3.6.

However, PwC cautions that there are valid concerns that Australia's advantage could erode due to a combination of factors including increasing costs and low productivity. Over recent years, the Minerals Council of Australia (2012) has warned of the structural deficits in our economy that have been masked by historically high terms of trade. 'Our country's attractiveness as a place to do business in a highly globalised industry is slipping due to a combination of rising costs, declining productivity and a deteriorating sovereign risk reputation. With commodity prices having fallen from peak levels, complacency and backsliding on economic reform pose a real threat to the minerals sector and to the wider economy.'

Further, Geoscience Australia (2014) warns that even though Australia has large economic resources of many mineral commodities, this is not a guarantee that such resources will continue to be exploited in Australia. In an increasingly globalised and competitive commodity market,

Figure 3.6: Australia's comparative advantage in mining



Source: Deloitte 2013 as provided in PwC 2014a.

multinational mining companies continue to search for mineral deposits across other geographies that will offer attractive returns on investment.

Australia's strengths in mining are primarily based on past discoveries, with no new significant discoveries in the past two decades. With a wealth of rich deposits at its disposal, Australia's mining sector is largely focused on extracting and exporting, to its potential detriment. The Australian mining sector is increasingly characterised by rising costs, falling productivity, declining commodity prices and falling investments. This comes as it is confronted by increasing competition from Africa, North Asia (Mongolia) and parts of Latin America. While Australia has a more favourable risk and security profile, it may not be enough over the medium term to hold investments here.

Australia does not yet have much of an advanced, high-value-added downstream sector for extracted minerals and ores (for example, by developing and marketing new types of metals), nor has it invested in developing new growth areas. This puts Australia at risk of not meeting the requirements of a 21st century knowledge economy but also leaves the sector, and by extension the economy, highly vulnerable to price vagaries.

Australia does have an excellent track record in planning, design, development and servicing of mining software and equipment, scientific analysis, exploration assessment technology, mineral processing technology, environmental services, and health and safety services and equipment. These could potentially provide major opportunities for advanced manufacturing, consulting and service industries both locally and globally, but research suggests that these avenues are not being developed, and Scandinavian firms are leading the way at present. One leading Australian company that has capitalised on those strengths and opportunities is highlighted in Box 3.1.

### 3.2.2 Where to now?

As emphasised in the report prepared for ACOLA by the Centre for Australian Foresight 'when dealing with the future, there are no right or wrong answers, just assessments of plausibility and relevance for particular contexts, which are in turn influenced by individual perspectives and beliefs about the future. As stories about possible futures, scenarios are not predictions of one future that urge us to "bet the farm" on a single locked in strategic or optimal choice. Instead they implore us to take the opposite approach—to find strategies that are robust, that stand us in

### Box 3.1: Taking advantage of the value chain

Orica takes pride in being an Australian company with a global footprint that seeks 'clever resourceful solutions'. Orica is the world's largest provider of explosives and blasting systems to the mining and infrastructure markets, is the global leader in the provision of ground support and tunnelling, and a leading supplier of sodium cyanide to the gold industry.

The company's major market sector is mining services. It has a workforce of more than 12,500 with operations in more than 50 countries and customers in more than 100. Orica has positioned itself to provide valuable supply chain capabilities for its customers and claims this strategic positioning within the mining sector allows it to maintain stability through continued global uncertainty.

Source: Orica 2013.

### Box 3.2: The future profile for mining

'The forecasts for the Australian economy continue to embody a gradual shift in growth from mining investment towards exports, non-mining business investment and household spending. While there are signs that this rebalancing is beginning, there remains considerable uncertainty about how it will proceed. In particular, there remains a large degree of uncertainty surrounding the exact profile for mining investment'.

Source: RBA, May 2013, Statement on Monetary Policy.

good stead regardless of the final shape of the future. Scenarios represent a range of potential outcomes for an organisation, from which consideration of strategy today can be informed'.

While the mining investment boom between 2002 and 2012 was a major contributor to Australia's economic growth, PwC points out that the peak appears to have passed and the consensus view is that mining investment will decline in absolute terms until at least 2017. Uncertainty exists however, on the extent of this decline (Box 3.2).

Australia faces a number of alternative scenarios for mining. These include a slow decline of the mining industry, the creation of a growing and sustainable mining industry, growing a value-added downstream sector, and refocusing effort to new growth areas. Of course, more than one of these alternatives is possible such as a sustainable mining industry with growing value addition in related sectors.

In 2011, participants from the Australian mining industry, CSIRO and academia developed *Vision 2040: Mining, minerals and innovation—A vision for Australia's mineral future*. This report aims to provide direction for a national strategy that transforms existing assumptions about how Australia can contribute to local and global development as illustrated in Box 3.3.

The focus of the Australian mining industry on the short to medium term remains 'extract and export' oriented and requires a longer term view and cooperative national leadership as recommended in the Australia 2040 scenarios. In order to regain world leading competitiveness, Australia should focus on issues as shown in Figure 3.7.

Skills shortages and lack of linkages with research institutions could see Australia become a relative laggard in terms of advanced, state-of-the-art knowledge. Unlike Australia, other key countries actively foster collaborative linkages between academia, businesses and policy-makers. This allows new knowledge to be developed into marketable products and services that are supported by appropriate industrial, trade and regulatory policies.

Australia needs to invest in more R&D, which includes (among others): humanities and social science research such as the sociology of mining towns and Indigenous relations; environmental challenges; improvement in productivity, and new methodologies and techniques for exploration and exploitation. Of course, issues around productivity improvement in mature process industries apply.

Australia should therefore prioritise increased investments in knowledge, as well as collaborations with local and international research institutions. The vocational education and training sector too should be further enhanced to complement the university education and, where appropriate, collaborate with it.

Infrastructure shortages and excessive regulatory burden threatens to seriously undermine Australia's current advantage in the mining sector. The national dialogue at present appears more focused on how to distribute the earnings of the resources sector rather than on how to ensure

those benefits continue. There is inadequate debate on what benefits and opportunities could be at risk from failure to proactively establish and reform the policy environment. Australia's regulatory burden is ranked amongst the highest in advanced economies. Despite ongoing public discussions about the mining sector, there is a lack of a coherent policy.

By contrast, Canada has announced a plan for a 'one project, one review' approvals process. As a country with a similar profile to Australia, Canada's priorities for its mining sector should resonate strongly with ours as highlighted in Box 3.4.

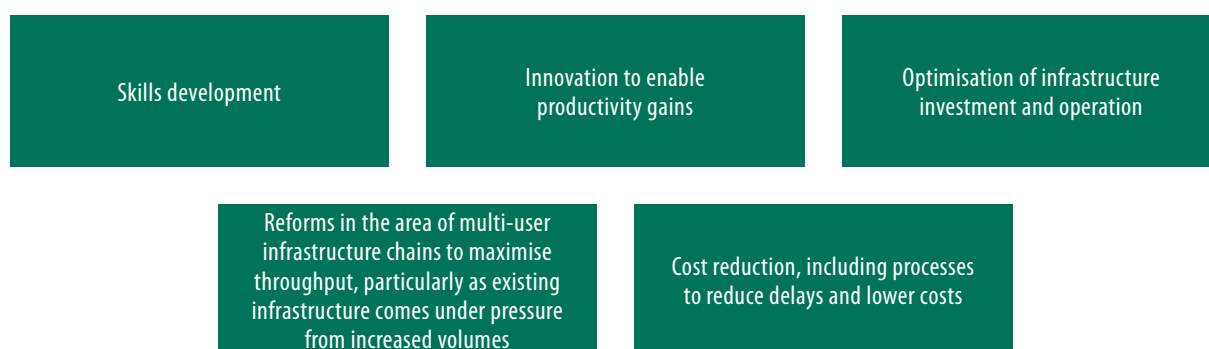
### Box 3.3: *Vision 2040: Mining, Minerals and Innovation—A Vision for Australia's Mineral Future*

In this vision, the participants recommended that Australia develop a national strategy for the development of its mineral resources that will guide future development and ensure long-term benefit to the national community. The development of a national minerals strategy would be an opportunity to integrate mining sustainability into economic planning. The report notes that such a strategy should include policy measures and programs that:

- improve the coordination of mineral development across states and territories through an organisation, similar to the National Water Commission, which would drive progress in sustainable management of Australia's mineral resources identify challenges, such as declining productivity and high currency values, and develop innovative responses
- improve knowledge of Australia's mineral resources including much stronger reporting requirements for exploration undertaken by private companies
- improve social and environmental outcomes by encouraging all mining and mineral processors operating in Australia to report under the Global Reporting Initiative
- improve capacity for innovation through collaborations amongst universities, mineral producers and other researchers
- facilitate the commercialisation of technologies that make a 'step change' in the environmental and social performance of mining and mineral production
- monitor and evaluate key social, environmental and economic indicators for mining and mineral production
- implement sustainability reporting on the Australian economy as a whole, to ensure that improvements by the mineral industry can be monitored and compared with other sectors.

Source: Mason *et al.* 2011.

Figure 3.7: Focus areas



Source: PwC 2014a.

In conclusion, though the mining sector has been a mainstay of Australian prosperity for the past two decades, the PwC report cautions against complacency.

It calls for proactive policies that would allow the sector to move into higher value-added downstream activities and to create value through collaboration with non-mining sectors such as manufacturing and services.

### 3.3 Manufacturing

Australia's manufacturing sector has faced negative publicity and reputational damage in recent years with the exit of highly visible multinational manufacturers, most notably in the car industry. What is less well known is the developing and highly valuable advanced manufacturing sector, which is poised to build on Australia's comparative advantages and increase its contribution to economic growth and global trade. This analysis draws on the ACOLA report on the *Role of Science, Research and Technology*

in *Lifting Australian Productivity*. It also draws on information from *Advanced Manufacturing: Beyond the production line* (Roos 2014) and *Global Perspectives on Achieving Success in High and Low Cost Operating Environments* (Roos & Kennedy 2015).

The manufacturing sector plays an important role in Australia's economy but its contribution to GDP has declined as other sectors such as mining and the services sector have grown in importance in the economy. While accounting for around 7% of GDP in 2013, its contribution to GDP has almost halved since 1980 as illustrated in Figure 3.8.

At the same time, employment in the sector has fallen from more than 15% in the 1980s to 8.1% in 2013 (Roos & Kennedy 2015). The decline can be attributed in part to growing automation, when that facilitates productivity improvements that are higher than the underlying demand growth. But it also points more broadly to structural change in the sector.

The rise of free trade and globalisation is affecting traditional manufacturers in advanced economies around the world. Their competitiveness has

#### Box 3.4 The Canadian Experience

Canada is a major mining country and a top ten producer of 17 key metals and minerals. The extraction and processing of these materials is an important part of Canada's industrial sector and an essential source of GDP, jobs and government revenue.

Typically, countries are thought to gain a competitive advantage from a resource endowment by moving up the value chain, in other words, by processing raw materials into manufactured goods.

However, Canada has leveraged its metal and mineral endowment not just by extracting and processing raw materials, but also by creating and marketing the knowledge of how to effectively and responsibly develop these resources.

It has a vast array of suppliers, service providers and professionals that help support miners and prospectors both in Canada and abroad e.g. the Sydney cluster.

Canada's global success in mining can be attributed more recently to the emergence of smart policies and innovative private institutions that are tailored to the unique attributes of the mining industry.

Unlike Australia, Canada is making huge strides in investing in higher value-added activities including mining finance, mining technologies, and spill-overs into other activities such as advanced manufacturing.

However, it has recognised five key areas that it needs to focus on to maintain its advantage:

Maintaining its pool of uniquely skilled people

Staying ahead of the pack on world-leading practices in finance and taxation

Setting up the infrastructure and international agreements today to ensure a competitive mining sector tomorrow

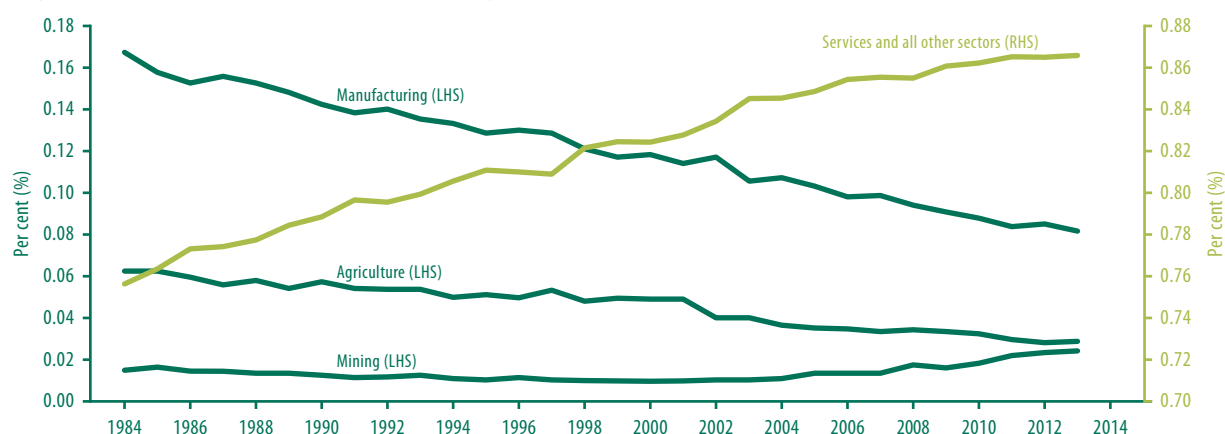
Becoming the world leader in the development of new mining technology and best practices

Social license and an efficient and predictable regulatory environment as emerging areas of comparative advantage.

Source: The Canadian Chamber of Commerce 2013.



Figure 3.8: Value added as a percentage of GDP, selected sectors



Source: Roos 2014, *Advanced Manufacturing: Beyond the Production Line* (ABS Cat 5206.0).

Table 3.2: Characteristics of traditional and advanced manufacturing

Traditional manufacturing	Advanced manufacturing
Focused on the production of goods.	Value creation is extended, so manufacturing is no longer just about production—services and manufacturing are inextricably linked, so that production is now the core of a much wider set of activities—the ‘virtual’ part of the total business—geared towards creating a tailored experience for individual consumers.  In 2011, only 28 per cent of Australian manufacturers with more than 100 employees derived value from services related to their products, compared with the United States and Finland, where the figure was closer to 55 per cent of manufacturers.
Much of the workforce is employed in low-skilled, blue-collar or production roles. Technical competencies are much more common than commercial competencies.	High-skilled operations that harness a wider skill base, including both technical and commercial competencies, and employ fewer people on the factory floor.
Firms compete on the basis of their own strengths. Competitiveness is based on stocks of knowledge, mostly developed and retained in-house. Strategies focus on the company: cost control, ‘total quality’ and continuous productivity improvement.	A solely internal focus is no longer sufficient to be competitive. Competitiveness is based on the ability to identify and harness globalised knowledge flows—the production, diffusion and use of knowledge. Individual firms cannot access all the information required to be competitive, so the depth and quality of a company’s networks and interactions is critical to its competitiveness.
Mass manufacturing of commodity goods—‘Any colour, so long as it’s black’ approach—with manufacturing functions typically bound to localities and conducted in large capital and labour intensive factories.	Firms rapidly and economically adapt physical and intellectual capital to exploit changes in technology, markets and customer demand. A strong customer orientation, including mass customisation or short runs. Greater flexibility in how and where people are employed. Global firms operating across national boundaries and in close proximity to cheap manufacturing inputs, and large sources of demand and innovation.
Energy intensive with large waste streams.	Manufacturing processes and products are more sustainable, including a move towards low-emissions, zero-waste and zero-carbon manufacturing. Manufacturing practices include built-in reuse; remanufacturing and recycling for products reaching the ends of their useful lives; turning waste streams into sources of value creation; and additive, rather than subtractive, manufacturing techniques.

Source: Roos 2014.



been weakened by low-cost competition from emerging nations such as China. In Australia, a strong dollar, high labour costs, rising energy costs and a small domestic market have also contributed to the decline. Traditional manufacturing played an important role in Australia's economy for a long time. However a changing business environment and challenging economic conditions have seen the emergence of successful advanced manufacturers. Some of the differences are highlighted in Table 3.2.

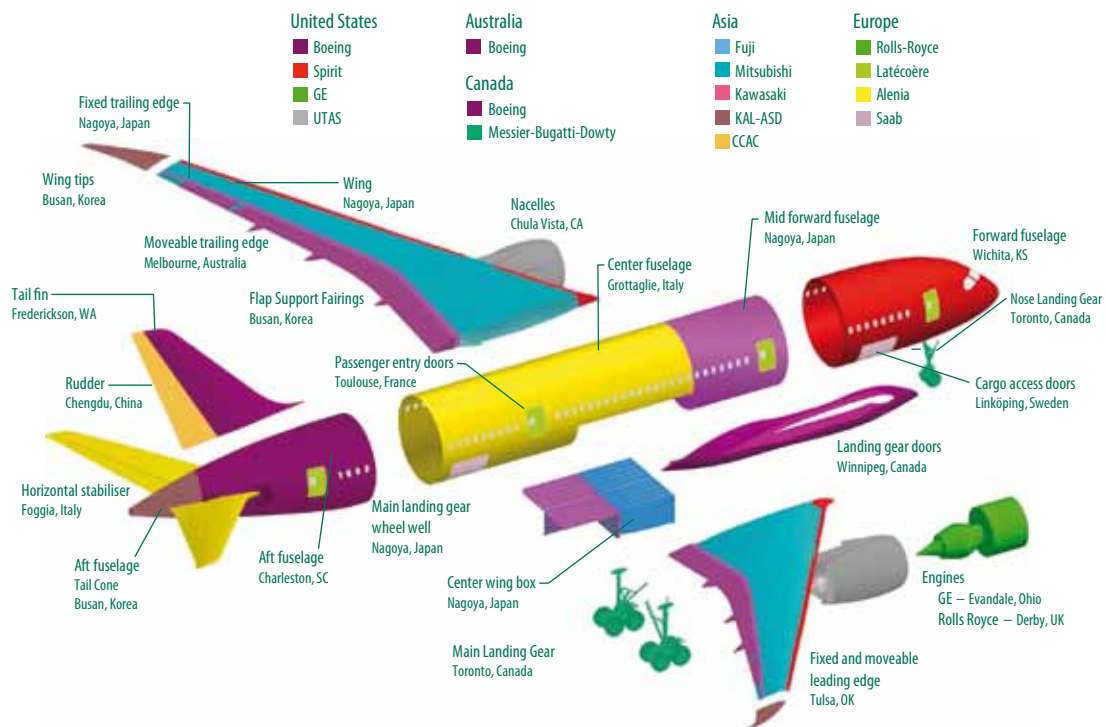
Advanced manufacturers recognise the important integration of services with a product and are positioning themselves along complex supply chains known as global value chains (GVCs). A GVC is a collection of operational activities that deliver an idea for a product or service to the market. These activities, which include research, development, design, assembly, production and marketing, can be distributed between a number of companies across the world. To capitalise on this development, innovation and access to high quality information and communications technology (ICT) are key.

A leading example of a successful Australian participant in a GVC is Boeing Australia. It has worked with its parent company in the US to provide flight control components for a number of Boeing airplanes. The Boeing 787 Dreamliner is one of these. It is assembled in the United States using components from around the world, including Italy, Japan, UK and Australia. Each country contributes a specific and vital component which, when brought together, form the Boeing 787 Dreamliner. This partnership is Australia's largest aerospace contract. The structure of this GVC is illustrated in Figure 3.9.

### 3.3.1 Developing Australia's comparative manufacturing advantage

Advanced manufacturing has an important role to play in boosting Australia's competitiveness in the global manufacturing market. The CEDA report notes there is widespread evidence that Australia's comparative advantage lies in high-value, low-volume manufacturing, with a strong focus on the design, R&D and innovation side of the production process. Specialising at the

Figure 3.9: The Boeing 787 Dreamliner manufactured around the world



Source: ATSE 2013.

pre-production end of the value chain also turns some of the natural disadvantages Australia faces into potential advantages (for example a skilled and costly labour force), while adding value to the production process is crucial to remain viable in a high-cost environment. The report highlights common characteristics of successful advanced manufacturers as highlighted in Box 3.5.

To build Australia's comparative advantage there are a number of factors where the CEDA report notes that Australian advanced manufacturing currently lags, namely collaboration, innovation, skills and capabilities. It also needs to capitalise on the advantages of improved technology and build its reputation as an important growth industry both domestically and internationally.

Effective collaboration is critical to innovation and Australia needs to facilitate increased research opportunities between industry and researchers to ensure that R&D and innovation are targeted towards activities that provide economic and social benefits. CEDA points towards the Grains Research and Development Corporation in the agricultural sector as an example of successful collaboration between industry and R&D. The GRDC is funded by industry and government and works closely with the industry participants to drive the development of world-class innovation to increase production, sustainability and profitability in the grains industry.

An innovative and skilled workforce will be critical to increasing productivity in the future. This will require more investment in the STEM (science, technology, engineering and mathematics) fields to develop those skills. It is important to note that Australia will also need to promote complementary skills in humanities and social sciences (HASS) fields to develop understanding of systems, cultures and the way society uses and adopts new ideas. Industry also has a role to play in investing in employer-responsive technical training and skills development within companies. CEDA notes that strengthening the links between industry and research institutions including universities, to overcome cultural barriers to undertaking applied research, will also drive the development of improved capabilities.

Without advanced technology, advanced manufacturing will not succeed. The CSIRO has identified robotics, mobile devices, consumer devices and cloud services as the four major groups of technologies that will enable advanced manufacturers to be highly responsive to consumer demand (Mak 2014). In all there are around eleven key enabling technologies that must be mastered along with their relevant production systems (Roos & Kennedy 2015).

Finally, improving the poor public perception of manufacturing in Australia will be critical to the development of the sector and help attract and

### Box 3.5 Characteristics of successful advanced manufacturers

**Innovation:** Successful advanced manufacturers innovate, constantly invest in research and development (R&D) and understand the role of technology as a competitive edge. They also innovate in non-technological areas and focus on simultaneously innovating to create value and innovating to appropriate value.

**Global value chain (GVC) cognisance:** They manage their value chain and position themselves within it accordingly—for example, by including pre- and post-production activities.

**Export focus:** They primarily serve export markets and often serve niche markets.

**Customer focus:** They understand and are very responsive to the needs of their customers and the increasing trend to customer-responsive customisation.

**Value focus:** They compete on value for money not on cost.

**Small and medium sized enterprises (SMEs):** Many advanced manufacturers are small and medium rather than large-scale enterprises.

**Highly skilled employees:** They have highly competent employees and highly capable management frequently combined with a high performance workplace system. They continuously invest in education of their workforce.

**Collaboration:** They are highly collaborative and understand how to manage competitive relationships.

Source: Roos 2014.

retain skilled workers, encourage collaboration with other sectors and countries, and promote Australia as an area of opportunity for advanced manufacturers.

### 3.3.2 Where to now?

There is an urgent need to raise awareness about the changing nature of manufacturing and the advantages of advanced manufacturing in securing a comparative advantage for Australia, boosting trade and supporting economic growth. As an innovative industry, advanced manufacturing will require an innovative approach from government, industry and researchers to contribute to its productivity and economic growth.

The focus should be on working together to develop an innovative workforce and improving entrepreneurship and business management skills. STEM training should be encouraged at university and VET levels, as should complementary HASS training and also strategic research collaboration with other countries. Government support through increased public sector R&D and reliable communications infrastructure will make an important contribution to Australia's productivity gains.

## 3.4 Services

The services sector dominates the Australian economy. In 2013, it accounted for close to 60% of Australia's GDP and for 78% of employment. Like many similar countries, the services sector in Australia has been growing as a share of the economy since the early 1990s, but its net exports have declined steadily after peaking in 2001–03. This review of the services sector by ACIL Allen Consulting focused on three sectors which have the potential to drive productivity growth in all other sectors, namely, education (post school), health and financial services.

In a general sense, any part of the economy not devoted to making things (manufacturing), taking them out of the ground (mining), or growing plants and herding animals (agriculture)

is colloquially classed as services. It is a highly diverse sector, spanning a range of industries, as shown in Table 3.3, and the boundaries with other sectors are also increasingly blurred e.g. service and manufacturing activities may frequently be done by the same firm (Agarwal *et al.* 2015).

ACIL Allen notes that a distinction needs to be made between services that are the consequence of economic prosperity and those that are the drivers of economic growth. The former employ a far greater number of people, such as the retail industry, entertainment, cafes and restaurants, but are not primarily driven by measured productivity or technical innovation. The industries that are the drivers of growth in an economy are those that are based on research and development, innovation and high productivity, with key inputs from highly educated (or highly skilled) workers, according to ACIL Allen.

The education, health and financial services sectors that have been chosen as case studies for this report are important because they are well-established and account between themselves for around 20% of GDP. This means that there

**Table 3.3: Service industries in Australia**

Electricity, gas, water and waste services (D)
Wholesale trade (F)
Retail trade (G)
Accommodation and food services (H)
Transport, postal and warehousing (I)
Information media and telecommunications (J)
Financial and insurance services (K)
Rental, hiring and real estate services (L)
Professional, scientific and technical services (M)
Administrative and support services (N)
Public administration and safety (O)
Education and training (P)
Health care and social assistance (Q)
Arts and recreation services (R)
Other services (S)

Source: ABS 2006.

already exists a critical mass of people, capital and expertise in these industries. These sectors are subject to potentially high rates of innovation and hence productivity growth. They are also highly regarded by global standards for their quality, resilience and outcomes. For example, the stability of the financial sector during the 2008 global financial crisis and the regular inclusion of several Australian universities in the world's top 100 lists have drawn much praise and comment.

These sectors have great potential for further growth, but also face risks, so the right settings need to be put into place to ensure their continued success and to prevent any regress. Government will play a critical role in determining success as each is characterised by pervasive government involvement, as a funder to two (education and health) and regulator of all three. While Australia's service sector is growing, its net exports are not, as demonstrated in Figure 3.10.

The education, health and financial services industries have gone against this trend and are rising, lending support to the view that Australia holds a potential comparative advantage in these particular areas.

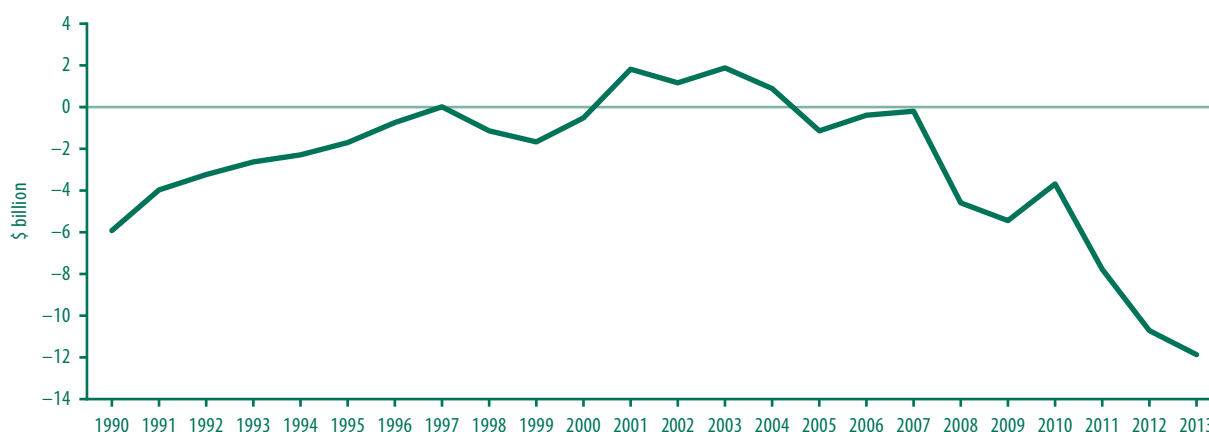
In 2013, the health care and social assistance industry contributed \$96,708 million of GVA and accounted for 6.3% of Australia's GDP. There were 787,000 full-time employed persons and 635,000 part-time employed persons in the industry. Australia's net trade balance in health services has been positive since 2007 with a net trade balance

of \$9 million in 2013. Australia's health exports were \$29 million in 2013 (ABS 2014b; 2014c; 2014d). The existence of imports and exports of health services of roughly equal size indicates Australia has a comparative advantage in some health services and not others at present.

The education and training industry has grown year on year for the past 20 years and contributed \$67,976 million in GVA to Australian GDP, equivalent to 4.5% of total GDP in 2013. There were 563,000 full-time employed persons and 354,000 part-time employed persons in the industry (ABS 2014b; 2014c; 2014d). Since 1986, universities have been permitted to accept international students and set their fees. In the decade to 2009 the sectors net trade balance grew strongly, but has since been declining. Changes to government migration policy, a strong Australian dollar, and negative international publicity on student safety and education quality have contributed to this decline (Grattan Institute 2013).

The finance and insurance industry has also grown over the past 20 years, contributing \$121,493 million in GVA to the Australian GDP in 2013, which is equivalent to 8% of total GDP (ABS 2014b; 2014c; 2014d). Australia's level of exports and imports as a proportion of financial services is low compared to other advanced economies. However, unlocking the potential increase in trade of financial services could boost Australia's productivity in the financial services sector and the economy as a whole (ACFS 2013b).

**Figure 3.10: Net trade of service industries (exports less imports)**



Source: ABS 2014c; 2014d.

### 3.4.1 Australia's comparative services advantage

The economic rise of Asia provides a significant opportunity for Australia to increase its net trade in these sectors. In the past 20 years, China and India have tripled their share of world GDP and their economies have grown by approximately six times (Australian Government 2012). ACIL Allen notes that as incomes in the region have grown there has been an increase in the wealthy and mobile middle class. With household incomes on the rise, less income is being used for necessities and there is greater demand for a diverse range of goods and services, including health and aged care, education and funds management.

As well its proximity to Asia, the country's highly educated workforce, political stability, successful macroeconomic policy, legal and regulatory framework and appetite for innovation, places Australia as a leader in the region. Table 3.4 illustrates some of Australia's common strengths across the education, health and financial services sectors that can provide a source of comparative advantage.

In addition, ACIL Allen points to the unique strengths and opportunities of the individual service sectors highlighted in this report:

#### Health

The health industry sector has world leading research infrastructure and scientific workforce as a result of decades of investment in research and development. It is viewed as cost effective as Australia's high health outcomes are achieved at a moderate cost. Australia's total health spending as a proportion of GDP was slightly lower in 2013, at 8.9%, than the OECD average of 9.3% (OECD 2013b). Australia's research spending is also strongly orientated towards medical and health-related disciplines, accounting for 29% of higher education research spending in 2010 (Grattan Institute 2013).

An ageing population and rising life expectancy in Australia and countries throughout the world will create greater demand for aged care and treatments for chronic diseases like diabetes, dementia, Parkinson's disease, cardiovascular ailments and certain types of cancer. Identifying the demand for these services and positioning Australia as a country of expertise will open

**Table 3.4: Australia's strengths in services**

#### Common strengths

##### Geographic proximity to Asia

Australia's proximity to Asia and similar time zones places Australia in an advantageous position to access Asian markets and customers, compared to locations such as Europe or the US. Australia's growing trade integration with Asia further reinforces our advantageous position as a trading partner to the growing region.

##### Public R&D expenditure

The Australian government provides substantial support for science and innovation; in 2012–13 this amounted to \$8.9 billion (Australian Government 2012). The support includes expenditure which supports business research and commercialisation; research and research training in higher education institutions; cross-sectoral programs and Cooperative Research Centres (Australian Government 2012).

##### Highly educated work force

Australia's highly educated workforce provides a strong base for our comparative advantage. Australia has some of the highest post-secondary education attainment rates in the world and as such offers a highly skilled workforce and quality of service.

##### Urban environment

Australia is a highly urban environment with the majority of the population living in cities. Combined with Australia's highly educated workforce, the close interaction of the population leads to high collaboration and sharing of ideas between individuals.

##### Macroeconomic policy and regulatory environment

Australia's macroeconomic policy and regulatory environment has proved itself over the recent past. This has been shown by increased business in the region following the global financial crisis for Australia's major banks due to their high credit rating and strong capitalisation (AFCF 2009). Australia's strength through the global financial crisis has improved the reputation of our regulatory system across the world (AFCF 2009).

Source: ACIL Allen Consulting 2014b.

export and growth opportunities. Investment in medical research will allow Australia to develop new technologies and treatments and strengthen its comparative advantage.

## Education

Australia's higher education institutions have had an excellent global reputation. This high quality has been demonstrated by recruitment of a large number of international students. As a small sector—there are only 39 Australian universities—it is also relatively easily monitored and regulated. Expanding opportunities for new international students, especially through Vocational Education and Training (VET), will allow Australia to capitalise on the emerging market in Asia. As technology improves and is adopted by Australia's major trading partners, off-campus study will be a major opportunity for education exports (Knight 2011).

There is also an opportunity for Australia to continue and expand its strategic engagement with its Asian counterparts in the field of research partnerships, not only to improve our capability through R&D but also to enforce our position as a leader in education.

## Financial services

The Australian financial sector as a proportion of GDP is larger than in most other developed countries (WEF 2012). The superannuation sector is very large by international standards and the pension fund sector is one of the biggest in the world, both in absolute and relative terms. It is the largest pool of funds under management in the region. The Australian Stock Exchange (ASX) is the 7th largest exchange in terms of market capitalisation and the 5th largest measured by free-float market capitalisation (ACFS 2013a). Australia also has a good regulatory management of systemic risk (ACFS 2013a).

Opportunities exist for Australia to export its banking services as well as increase its penetration of financial management and funds management services in Asia. There also exists an opportunity to develop skills in Islamic finance

and export Islamic finance services, according to ACIL Allen.

Despite their positive outlook, the education, health and financial services sectors face common risks which can affect their comparative advantage including:

- lack of diversity in the Australian economy, which hampers long-term success of non-mining export-dependent industries
- sensitivity to currency fluctuations
- distance from European and US markets
- low levels of private sector R&D spending
- high tax rates for companies and individuals
- an ageing population.

Such risks are subject to change. For example, the tyranny of distance is less in an integrated cyber-physical environment. They can also be a source of advantage. For example, dealing with an ageing population successfully.

The health sector itself faces additional weaknesses in its poor integration of new technologies into the whole healthcare delivery process, its low productivity relative to other Australian sectors, skills shortages, and poor responsiveness to changing patterns of disease and treatment.

The education sector has faced significant threats to its reputation in recent years due to reports of violence against international students, particularly Indian students, and government visa changes and a high exchange rate. Australia's universities are perceived as ranking below the top for research. There are also regulatory gaps and over-regulations affecting flexibility and innovation capability, particularly for the non-university VET sector. Relatively low public funding correlates with relatively high student-staff ratios, a problem for classroom experience.

The finance sector has a primarily inward focus and poor exposure to trade. The common law jurisdiction creates impediments for many potential foreign investors particularly those in the Asia-Pacific region.



### 3.4.2 Where to now?

The key emphasis of the ACIL Allen report is that all three service industry sectors are sources of Australia's comparative advantage, but this is neither inevitable nor permanent. Maintenance and enhancement of comparative advantage in a highly competitive global environment requires constant attention, as well as support from a conducive political and policy environment. Another implication that can be inferred (though this is not explicitly stated) is that these sectors are highly dependent on, and sensitive to, perceptions about Australia in global markets. This is because, unlike in the case of manufacturing, mining, or agriculture, there is often a case of direct interaction between producers and users of services. To manage these risks associated with Australia's reputation, investment must be made in humanities and social sciences (HASS) fields to ensure support of the technological opportunities created within the science, technology, engineering and mathematics (STEM) fields.

The Australian Government has stated the goal of Australia having one or more universities of the same standard as the best universities in the United States. However it recently announced that it is reducing the proportion of the costs that it will pay to educate students, so students will have to pay more themselves. Even with students paying higher fees, government will need to invest more in universities if Australia is to fully realise its comparative advantage in education.

Medical research is something Australia does very well and is intimately linked to a vibrant health industry. Government investment in Australian medical research should not just continue but be expanded. Successful medical research also requires state-of-the-art hospitals to enable research to be translated into clinical outcomes, and industrial outcomes e.g. medical devices. Therefore serious investment in hospitals is also required, according to ACIL Allen.

A highly functioning telecommunications infrastructure will benefit all industries and in particular financial services, education and

health. The government has a critical role in ensuring that Australia has a competitive, fast and efficient telecommunications infrastructure and supporting policies.

Regulation needs to be smart and to achieve its maximum intent with the least amount of intrusion. Australian financial regulators have done a good job in the past as evidenced by Australia's strength through the global financial crisis. However continued success will require adaptive and innovative regulation.

The government's role in negotiating with other governments to reduce trade barriers will be essential to allow Australia to fully exploit its comparative advantage in services. The government also controls immigration and visas. If Australia is to export education and health services, it is important that unnecessary restrictions on entry into the country not exist.

## 3.5 Conclusion

The Australian economy has solid foundations across its key sectors and the can-do attitude of its workforce has seen it grow and prosper. However, it cannot rest on its laurels. Without continued improvement and reform, Australia risks losing hard fought comparative advantage in all these key sectors of the economy.

Australia possesses a significant wealth of natural resources and the production of base commodities has supported its economic growth in the past. Our mineral resource endowments are among the best in the world and the mining boom has helped support Australia's economy through the recent global financial crisis that crippled many economies. Australia's natural environment further supports a broad agricultural sector that is world-renowned for its clean and green products.

However, the factors that have helped build Australia's prosperity and current comparative advantage could stymie development if government and industry do not heed the inherent risks they pose and develop strategies

to take advantage of the opportunities in future markets. Australia's reliance on the export of low-value commodities in mining and agriculture leaves it vulnerable to currency fluctuations, commodity prices and global demand. It faces increasing competition from lower-cost international markets in the production of commodities and the manufacturing of value-added products. While geographically close to Asian markets, our distance from European and US markets is also a disadvantage.

To secure its place in global economic prosperity, Australia needs to move away from its extract and export focus and learn from countries such as Canada, Norway and Sweden that are building value-added opportunities. The reality of the modern economic environment is that countries are operating in vast Global Value Chains and Australia must embrace this.

Australia has a skilled workforce and a talented pool of world-class researchers and academics. There is high support for public investment in R&D and the basics from the established transport and communications infrastructure. Australia has good democratic conditions and lower levels of government support than other countries in industries such as agriculture. Its geographic proximity to the Asian region uniquely places it to take advantage of continued opportunities for growth in the delivery of value-added products and advanced services.

Australia needs to work smarter. It must improve the collaboration between government, academia and business to foster innovation and develop commercial solutions. Financial constraints on R&D are the biggest impediment to innovation in Australia. Low levels of private sector R&D and a lack of collaboration have left Australia lagging in the area of applied research and commercialisation.

Government has a role to play in developing policies that support collaboration and encourage greater investment in R&D. Underpinning this is the need for urgent attention to be paid to enhancing both the development of Australia's pool of skilled workers through focus on science, technology, engineering and mathematics (STEM) fields of study and through the supporting humanities and social sciences (HASS) subjects. Investing now in the skills, value-added products and services of the future will help secure Australia's comparative advantage and place in the global economy of tomorrow.

### 3.6 Findings

- Industry policy that relies upon past strengths only will not yield the desired results unless complemented with new ones. This is due to realities of both globalisation and the revolution in information technologies.
- Continued future growth requires development of new skills, capabilities, and institutional imperatives. The current prosperity has been the result of focusing unduly on the lower end of the value chain, whether in terms of extracting and exporting minerals and ores, or growing and exporting basic agricultural commodities. This cannot be a viable strategy for the future. The nation as such does not adequately focus on adding value to these, even though that is what we would expect from a highly developed nation with a skill-intensive workforce.
- Australia's stock of natural resources and global reputation of its skilled work force are national strengths. However, the Australian market size is limited, and continuing growth requires that global markets are targeted and opportunities realised.



- Sectoral analysis shows that Australia needs to have world-class infrastructure, not just in physical terms (roads, ports, utilities, etc.) but also digital infrastructure that supports large data transfers and high speeds.
- The results of the previous chapter has shown the burden of government regulations are worryingly onerous, and are widely seen as a problem by both senior business executives and public servants. Furthermore, stakeholder surveys have shown that government (regardless of political affiliation) is not perceived as providing adequate leadership. There appear to be concerns about short-termism and about how government structures affect incentives.
- Even with regards to industrial sectors themselves, two themes stand out. The first relates to narratives of industrial specialisation, and the second to calls for increased R&D spending by both governments and businesses. Indeed, earlier results have shown the dissonance in the number of government studies that have focused on increased research on one hand, and on the poor innovation efficiency and outcomes on the other. Australia's performance in translating research into outcomes through successful commercialisation is quite poor.
- Narratives based on industrial specialisation miss an important reality: most of global production is now based on global value chains and global production fragmentation, where even a single product from a single industry is assembled from parts produced all over the world. This applies to products ranging from commercial aircraft (Boeing) and children's toys (Barbie dolls). Countries specialise, not in industries, but in specific elements of the value chains.
- If Australia is to seriously leverage its national strengths to gain from participation in such global networks, then it will need to develop a multi-dimensional skills capability. Indeed, to complement a strong technical skills set in STEM, a strong focus on HASS and a strong management capability are all needed. Australia also has a strong VET sector that can be further developed and leveraged. The HASS skills are needed to understand the nuances and diversities of different cultural attitudes and values.
- It must be recognised that in Australia skills development has also powerfully included immigration, both for short-term and long-term contributions. The immigration program should be further refined to better contribute to properly complementing domestic skill formation.
- Australia needs to improve its competitiveness and productivity capability. Several things are needed for this, in particular, an effective taxation system that incentivises innovation and risk taking.

# 4

## The bedrock: foundations of a free, fair and prosperous society

### Introduction

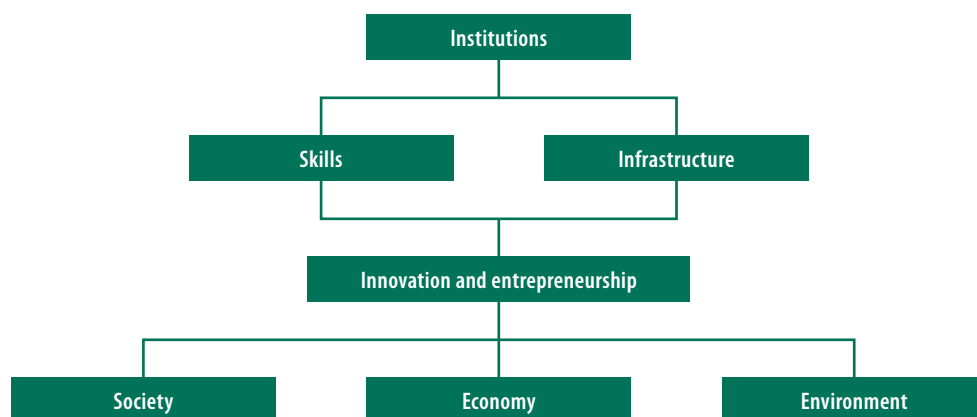
Examination of Australia's standing in relation to global benchmarks and assessment of the country's position by key stakeholders indicates that the uncertainties ahead, as documented by scenario analysis, would best be addressed by enhancing areas of advantage and redressing the areas of disadvantage, as assisted by national policy reviews.

Sectoral analysis shows that all areas can benefit from attention to the economy and society's foundations. Facilitating this is the basic requirement for underpinning the future prospects of the nation, particularly in the face of ongoing and emerging challenges as well as opportunities.

Getting the basics right is therefore the first and foremost strategy required to build comparative advantage. The key elements were outlined in Figure 1.2 above, and on the enabling side comprised the following (Figure 4.1).



Figure 4.1: Foundation for creating advantage



Source: Adapted from Figure 1.2.

What are the basics? The institutions that govern our choices are the best place to start as these define the rules of the game by which we seek to describe and address the issues ahead. We then apply the skills of our people to these issues as honed by education and training and as assisted by the economic and social physical infrastructure that people have to work with. Advancing these activities by devising new approaches to their design and delivery adds further value to our national efforts, so that innovation too should be seen as foundational.

Naturally a principal focus of these activities is the generation of our material standard of living, which means that a key focus is on the economy and how well it functions and delivers the goods and services that Australians require. But Australians are concerned that this economic progress be delivered fairly and equitably so that growth is democratic and inclusive. They are also concerned that such growth operates in an environmentally sustainable way. Australia as a nation therefore is one oriented to a 'triple bottom line' in relation to national advance, including with due regard for our international obligations.

This chapter is organised to provide further insight into where and how each of the elements of the foundations for creating advantage can be viewed for advancing Australia's future.

## 4.1 The role of institutions

Professor Douglass North, the recipient of the 1993 Nobel Prize in Economics for his work on institutions and economic development, defines institutions as 'the humanly devised constraints that structure political, economic, and social interactions'. They consist of both informal (customs, traditions, and value systems, etc.) and formal constraints (constitutions, property rights and laws) that collectively create order and reduce transaction costs for people. They ultimately determine the incentive structure of an economy by helping to mitigate the uncertainty arising from incomplete and non-shared

information, which is a characteristic feature of 21st century globalised economies (Stiglitz 2002).

Institutions play a very important role as an explanation of national prosperity and sustainability. Whereas on the one hand, traditional 'neoclassical' economic thinking emphasises supremacy of free markets as drivers of growth, institutions explain the operation of these markets also in more multi-dimensional terms of legal structures, division of power, and socio-cultural principles. As such, they foster a complementary approach to national development. They do this because institutions:

- create checks-and-balances that prevent, or at least slow down, aggressive policy decisions and abuse of power (Twomey & Withers 2007)
- create 'soft power' by conveying a regard for rule of law (Nye 2004), which allows a nation to influence global agendas and policies
- help to deal with change by acting as repositories of common standards of agreed practices, as well as of knowledge and experience
- mitigate uncertainty and create incentives for people to engage in productive activities by providing common, yet critical services that would be impractical for individual provision (North 1991).

The Compendium of National Reports that was initially completed for the ACA report summarised the findings of 35 major reports done for Australia by governments, multilateral organisations, and respected consultancies and think tanks. It was found that a mutually reinforcing troika of rule of law, a strong democratic system, and stable and efficient institutions were frequently mentioned as a core national strength for Australia. There are, however, many types of institutions such as legal, economic, and social. According to the PwC report on institutions and innovation prepared for this project, the various channels through which institutions affect societies are summarised usefully in Figure 4.2, to help with interpretation of their role.

The compendium of global benchmarking reports prepared for this ACA report further show that Australia's performance varies greatly across and within various institutional metrics, with social institutions performing well, but the overall high rankings for accountability and property rights mask variations in the sub-categories. For example, Australia ranks very favourably in terms of quality of life and low corruption metrics, but relatively poorly in terms of government efficiency and burden of regulations. Similarly, in an innovation context, it ranks highly in terms of basic research, but relatively poorly in terms of research efficiency and research commercialisation. This poor outcome relating to commercialisation is significant because in its competitiveness survey of around 144 countries, the World Economic Forum categorises Australia among 35 advanced economies that require more than 'catch-up' growth and need to have a strong element of 'innovation-driven' growth.

A concern over institutions is also consistent with two of the guiding principles—resilience and innovation—that were identified as important for Australia as it seeks to adjust to 21st century challenges and opportunities. These principles can be pursued in some of the most fundamental features of Australian identity and politics. The case of Australia's federal structure is a key example. This is important because policies are made within the federal context, and the Australian

Constitution demarcates the policy areas for federal and state governments. Whether this is optimally configured for the future is the issue.

Likewise, any nation that aspires to become an innovative society must look at the way in which it incentivises and regulates innovation. The most fundamental institution that does this is the legal intellectual property regime of a nation.

This chapter therefore considers and evaluates the effectiveness of Australia's federal structure and intellectual property regime as drivers of its comparative advantage, in order to show the importance of institutions in such concerns. It then looks at market institutions themselves and how their operation may be further advanced in the Australian context. It finally looks at cultural institutions too and how these may be enhanced to support comparative advantage for Australia.

#### 4.1.1 Political institutions

As an institution, the federation has allowed Australia to deal effectively with great challenges and changes, and yielded one of the highest living standards in the world. Unlike many resource-rich countries, Australia has remained a stable, liberal democracy with an abiding rule of law, free press, economic vibrancy and cultural cohesion. Australia's federal structure has therefore *prima facie* been a source of national strength and comparative advantage for Australia in the past, and hence can be a critical determinant of future success as well.

Analysis for this report finds that federal nations do substantially better, relative to unitary states, in per capita and aggregate income growth (Elnasri 2015). However, while Australia shares in this advantage, it does so less than the federations generally within the OECD, and significantly less than the best performing federations, when controlling for other factors behind growth. The source of its lower rankings within OECD federations is established by analysis to be its lower fiscal decentralisation. As Figure 4.3 shows, the growth impact of fiscal decentralisation is higher in Switzerland (22.2%), Canada (19.5%), and Germany (10.4) than in Australia (5.8%).

Figure 4.2: Channels of institutional influence



Source: PwC 2014b.



It is pertinent, therefore, to ask whether this critical national strength remains suitably specified and robust as Australia repositions itself for 21st century challenges and uncertainties, as examined in the scenarios in Chapter 2.

Mega-trends and game-changers and multiple scenarios do present four important implications:

- First, it is clear that governments have to fulfil a spectrum of functions in order to ensure national security, prosperity and general wellbeing. Some of these relate to management of the strategic ecosystem through appropriate regulations, international negotiations and partnerships, and internal coordination and the rule of law. Yet others relate to areas that directly affect the opportunities available to people and their quality of life.
- Second, different types of functions should be handled by different levels of government that are best positioned to do so. This requires clear demarcation of responsibilities and specialisation between the various levels. Because federalism is predicated on both these principles, it allows unique advantages in dealing with a complex and uncertain environment.
- Third, it is important to ensure that each level has the requisite skill and resources needed to carry out their respective functions. A division of responsibilities is meaningless without the means to carry out those responsibilities.

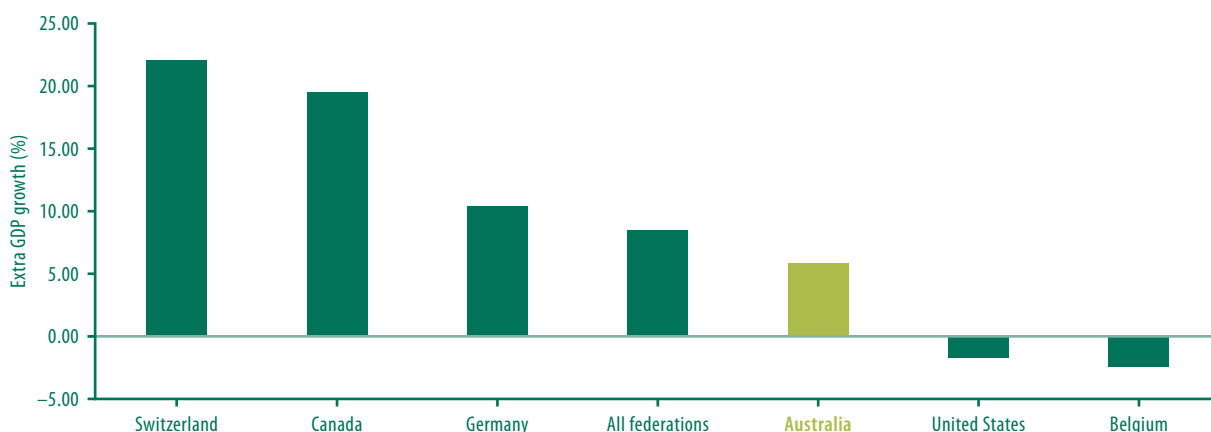
And if control over resources is highly skewed and asymmetrical, this would create perverse incentives and unproductive contests for those resources, which in turn would compromise competitiveness by diverting focus away from primary issues and priorities.

- Lastly, both the means of raising the resources and their allocation should be as non-distortionary as possible. Since taxes are the primary mechanism for raising revenues, the taxation regime should not create perverse incentives or efficiency losses.

Thus institutions matter and governance is important for institutions. Governmental institutions are at the core of doing this well, and the question of federation becomes the key test of whether Australia has optimised these institutional settings.

What this effectively means is that the jurisdiction of the central government should cover those functions and policy areas that would apply equally to all constituent states and which, if left to the states, would create confusion, conflict and unnecessary administrative burdens. Typical of these former are monetary, foreign, and trade policies; to help fix ideas, imagine what would happen if each of the eight Australian states and territories had its own currency or representations to other nations! What if the states again set different tariff rates on imports, or sought to raise an army?

**Figure 4.3: Growth impact of fiscal decentralisation\* in OECD federations, 1950–2010**



\*This chart shows the extra impact on GDP, in percentage terms, that comes from fiscal decentralisation, relative to all OECD unitary states taken together. The calculated value for Austria is not shown here because it is very close to zero.

Source: Elmasri 2015.

On the other hand, states should be responsible for services that are delivered responsively directly to the people. Common examples would include health, education, and public infrastructure. This allows for greater customisation of policies, and a closer involvement by people in the democratic process by allowing them to influence decisions for activities close to them.

Devolution of power to state (and lower) levels allows for policies that affect local communities to be made by people from those communities, and which in turn reflect an understanding of the particular cultural, geographical, climatic, and demographic nuances and constraints.

This is the argument for suitable delegation and decentralisation.

#### 4.1.2 Commonwealth-state relations and division of resources—the Achilles heel

The importance of the federal system of government for dealing with the 21st century challenge is thus clear, behind that is the importance of appropriate funding arrangements for ensuring the effective functioning of the federal system. This section discusses both of these in the Australian context, to help illustrate the role of institutions in creating comparative advantage.

Section 51 of *The Constitution* formally demarcates the responsibilities for the Federal and state governments, but the current state of Australian federalism is nevertheless characterised by some duplication of responsibilities, lack of accountability, highly contested fiscal relations between the two principal levels of governments, and an uneasy subsidiary role for local government. There is a lack of clarity regarding who is responsible for what functions (DPMC 2014), and about two-thirds of the Australian population does not believe that the governments work well together (*Australian Constitutional Values Survey 2012*). A growing chorus of voices has therefore questioned the effectiveness of Australian federalism, and called for a review and

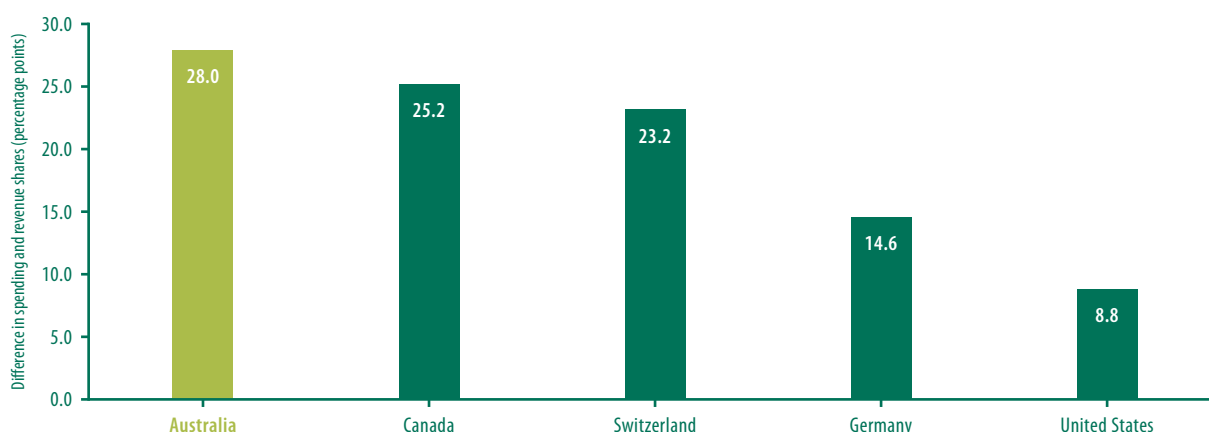
reform of the federal structure, including the funding arrangements that underpin Federal-state relations (DPMC 2014). The surveys of stakeholder's opinion reported in Chapter 2 confirm this concern.

The problems with Australian federalism are therefore already well acknowledged, and efforts are being made to understand and address them. A White Paper on Australian federalism was under production at the time of this report's preparation. This ACA report will not attempt to second-guess the recommendations or the practicalities of this, but will summarise the core arguments around the key issue of finance and place the problem in a broader global context. In doing so, it will emphasise the importance of federalism and its reform for Australia's long-term national capability, and hence the importance of an effective national response to the forthcoming White Paper for gaining future comparative advantage. The resourcing issue is also crucial for focus as it overlaps with the further issue, to be discussed below, of taxation reform.

Effective functioning of the federal system responsibilities comes down to whether the different parties have access to adequate resources to carry out their mandates. The answer in the current context is a clear 'no'. A related issue is whether this is actually important, i.e. whether an effective federal system of government can actually be a source of sustained national advantage. The answer here has to be an unequivocal 'yes'.

The allocation of resources between the two levels is highly asymmetrical, with the Federal government collecting most of the revenues raised, and distributing it amongst the states through unconditional and conditional grants (Cole 2014). The latter are called Special Purpose Payments (SPP), and allow the Commonwealth to mandate the use of those funds for particular purposes. The problem with such an arrangement is that grants can be motivated by national political considerations, and may be contrary to what states actually need or prefer, including if different political parties are forming the governments at the Federal and state levels, respectively.

Figure 4.4: Vertical fiscal imbalance, selected federations, 2005–12



Notes: The values are calculated as a difference between the State and Local Share of Total Spending, and the State and Local Share of Total Public Revenue.

Source: Elnasri 2015.

While this phenomenon, called vertical fiscal imbalance (VFI), is considered typical in federations, the extent of the VFI is most extreme in Australia when compared with other major federations within the OECD. States account for nearly half of total public spending in Australia, but account for less than a fifth of the revenues. This has created a major dependence of the state governments on the Commonwealth for financing, and clearly results in ongoing political conflicts between the Federal and state levels over adequacy of transfers (Figure 4.4).

This problem is significant in itself, but is further compounded by the dominance of the Federal government in tax collections. The following comparisons of tax revenues going to central governments in federal countries within the OECD shows the gross imbalance in federal-state financial relations in Australia, with the Federal government accounting for 81.4% of all tax revenues raised in the country—the highest proportion accruing to any central government (relative to the states) of the federated countries within the OECD. The US and Canadian central governments get about half the level for Australia, and Germany's central government share is the lowest within the OECD. Conversely, with the exception of Australia, Belgium and Mexico, Australia's state governments get the lowest proportion of tax revenues compared with the OECD cohort (OECD 2014e).

The extent of the VFI is made more acute by the fact that Federal grants may themselves be

insufficient for states to perform their functions efficiently. As Twomey and Withers (2007) point out, Federal functions such as tax collection and social service disbursement are more digitalised, and therefore more amenable to cost-saving productivity enhancements. States' functions relate to personal service delivery, and are by default more labour-intensive, which make cost savings relatively more difficult. Not only do states have higher unit costs, but combined with projected population increases, the projected cost pressures on them can be strong. Despite this, tax revenues accruing to states have increased at a far lower level than to the Commonwealth.

This also diverts government attention away from the more important task of governing, and arguably results in a cycle of 'buck-passing'. A typical anecdotal example relates to the provision of health services, where states blame the inadequacy of service provision on insufficient funding from the Commonwealth, whereas the latter says that health delivery is a state responsibility. These dynamics can compromise the very effectiveness (based on specialisation) that federation seeks to achieve (Table 4.1).

As things currently stand, the spirit of the federal structure has departed from that originally intended by the framers of the Constitution, and in a manner that was not anticipated by them. An intended division of powers has given way to increasing centralisation of powers in the



hands of the Commonwealth. Moreover, this did not happen as a result of legislative changes, but due to a liberal interpretation of statutes by the courts (Twomey & Withers 2007), whose judges are appointed by the Commonwealth government. Since the Second World War, a series of High Court decisions have given progressively greater control over resources to the Federal government (Podger 2008). This allowed the Federal government to have a greater level of involvement and interference in states' operations, including in functions that the Constitution originally allocated to states.

Most of all, the extent of the VFI and the resultant conflicts have a direct adverse impact on the national productivity and competitiveness outcomes by diverting focus and resources away from important priorities and issues. For example:

- there has not been a single White Paper review of Australian diplomacy or foreign policy in the past 25 years
- the first strategic review of the defence sector was underway at the time of this report's drafting

- there has not been a systematic review of Australia's intellectual property laws in around 20 years.

This is strange, since foreign policy and defence are amongst the most important functions for the Federal Government, and the fall of communism, rise of transnational terrorism, resurgence of Asia, and revolutions in ICT have transformed our external and operating environments over this time.

By contrast, the Federal government has completed multiple reviews of secondary school education, which is clearly the mandate of state governments. The results from this federal involvement in school education are not encouraging, with an ACOLA report on the international comparisons of STEM performance finding that Australia's performance against global benchmarks is either declining or static. (Marginson *et al.* 2013).

The strength of federal political institutions for Australia is evidently diminished by current fiscal and other arrangements. Reform could be highly beneficial (Box 4.1).

**Table 4.1: Central Government revenue shares in total taxes and overall competitiveness rankings**

Country	World Economic Forum, Global Competitiveness Rankings 2014	
	2012* (%)	Overall competitiveness
Australia	81.4	22
Austria	66.5	21
Belgium	57.0	18
Canada	41.2	15
Germany	31.5	5
Mexico	81.0	61
Switzerland	35.3	1
United States	41.9	3
Unweighted average	54.5	

\*This is the latest year for which OECD tax data is available. It is taken from the 2014 *Revenue Statistics* report.

Source: OECD 2014e.

#### Box 4.1 Federalism reform

An ineffective federal framework undermines Australia's long-term national advantage by creating various mismatched priorities, perverse incentives, efficiency losses, and resource misallocations. Improving Australia's comparative advantage would therefore call for fundamental reforms.

### 4.1.3 Legal institutions—the case for innovation

The issue of innovation is a crucial one for Australia, it is widely, and rightly, acknowledged as the growth model for any advanced economy as it reorients itself towards the demands of the 21st century. As a nation, Australia has shown a real propensity for producing both world-respected innovators as well as world-changing innovations.

The examples compiled for this project given in Table 4.2 clearly show the wide breadth of areas that Australian innovators have contributed to. But they also show the importance of broad, ‘out-of-the-box’ thinking about the myriad problems that can be solved effectively through innovations, and of the many steps involved in turning a proof of concept into a profitable commercialised venture.

Australia also has some great strengths that can be leveraged. These include a skilled and educated population, rule of law, moderate climate, high public accountability, and social cohesion. All of these are great for attracting both human as well as investment capital. The former of these can further be leveraged to create

and utilise linkages in their respective home countries.

It is important to also see how the general cultural and democratic climate of freedom of expression has supported innovation and ideas through the humanities and social sciences. It is notable for example that Australian thinkers in these areas contributed greatly to three of the great revolutions in social understanding and change in the later 20th century namely:

- Female Liberation: Germaine Greer, *The Female Eunuch*, 1970
- Gay Liberation: Denis Altman, *Homosexual: Oppression and Liberation*, 1971
- Animal Liberation: Peter Singer, *Animal Liberation*, 1975

Or, to take a different example, consider Australian innovations in public policy emanating from the humanities and social sciences that have been highly influential in Australia and internationally:

- Income Contingent Loans for Higher Education (Bruce Chapman)
- Points Based Immigration Selection (Glenn Withers)

**Table 4.2: List of recent and/or most famous Australian inventions**

Significant Australian inventions	Inventor	Year (approx.)
Gardasil and Cervarix cancer vaccines	Professor Ian Frazer	2006
Google maps platform	Rasmussen brothers	2003–04
Spray-on skin	Professor Fiona Wood	1999
Frazier lens	Jim Frazier	1993
Wireless Fidelity	CSIRO	1992
Extended-wear soft contact lenses	CSIRO	1991
Polymer bank notes	CSIRO, University of Melbourne, Reserve Bank of Australia	1988 (year introduced)
Baby safety capsule	Bob Botell and Bob Heath	1984
100 varieties of cotton	CSIRO	Since 1984
Dual flush toilet	Bruce Thompson	1980
Cochlear implant (bionic ear)	Professor Graeme Clark	1978
Ultrasound scanner	CSIRO	1976
Permanent crease clothing	CSIRO	1957
Penicillin	Dr Howard Florey	1939

- Universal Compulsory Health Insurance (John Deeble and Richard Scotton)
- Restorative Justice (John Braithwaite)
- Resource Rent Taxation (Ross Garnaut)
- Child Support Guarantees (Meredith Edwards)
- Languages Policy (Joseph Lo Bianco)

Along with education, innovation and productivity are perhaps the most studied topics in Australian policy review. However, despite being the subject of numerous reviews for over a decade, innovation performance has steadily slipped in global rankings, as discussed in Chapter 2.

These results clearly show that Australia lags behind other advanced countries in terms of its innovation performance and outcomes, as opposed to inputs. The important questions therefore, from the perspective of comparative advantage, relate to the primary constraints for effective translation of research into outcomes, and how these constraints can be alleviated.

An important part of the problem relates to how innovation is framed in the general public discourse as involving technical/scientific inventions and improvements. This is both misleading as well as incomplete. A more appropriate definition of innovation from the OECD is:

Innovation is the implementation of a new or significantly improved product (good or service), process, new marketing method, or a new organisational method in business practices, workplace organisation or external relations.

(Withers & Gupta 2013)

Innovation can therefore include any activity that improves the competitiveness and/or profitability of a firm in a sustainable manner.

The empirical and commissioned reports done for this ACA project have identified several important constraints. Two core constraints that are not only complex but primarily affect the incentives of firms to engage in innovation are intellectual property and innovation finance.

Since intellectual property relates to legal institutions it is usefully considered here. Innovation finance is considered separately in section 4.1.3 below.

The issue of innovation cannot be decoupled from that of intellectual property, since innovation (particularly in the scientific and creative domains) directly affects the incentives for engaging in innovative activities.

**How innovation is generated, regulated, and rewarded is therefore a matter of prime concern for any nation aspiring to be a knowledge economy in the 21st century.**

According to a PwC study (2014b) commissioned for this project, the intellectual property (IP) regime needs to balance two competing considerations. On one hand is the need to foster new innovations, while on the other is the need to reward creators of existing innovation, whose works often reflect considerable risks, efforts, and costs. The biggest challenge for governments subsequently is how much monopoly power to allow to innovators while at the same time proscribing anti-competitive activities by organisations.

A basic principle is that a nation's IP laws should foster its national interest and help it secure future growth. However, as things currently stand, how IP should advance the national interest, or indeed what the national interest should be, is a highly contested issue. This in turn results in an intense debate on the setting of the IP, with one side calling for further tightening of the IP laws, and the other calling for their relaxation. The main arguments are summarised in Table 4.3.

From a comparative advantage perspective, Australia needs to focus carefully on whether or not its IP arrangements are geared towards fostering Australia's long-term innovation capability. This needs to be done in context of its unique characteristics and circumstances, the evolving impact of technology and social values on industrial structure, and the constraints placed by existing institutional arrangements.

While an effective and credible IP regime has arguably fostered past global growth and prosperity, this report finds it a matter of concern that in the past two decades, there has been no strategic, comprehensive, evidence-based review of Australia's intellectual property regime, with regards to an evolving global, strategic and technological landscape (It is noted that several piecemeal reviews have taken place, including by the Advisory Council on Intellectual Property (ACIP), an independent body appointed by the Australian Government, and the Australian Law Reform Council (ALRC). However, overall there does not appear to be a comprehensive treatment of IP in a strategic context of Australia's long-term capability development or comparative advantage). This may explain a rather haphazard evolution of Australia's IP regime, without a clear linking with Australia's unique national characteristics and long-term goals—a situation needing both review and redress.

From Australia's point of view, five important considerations call for a comprehensive review of the IP framework:

- The nature of production has changed considerably over the past 20 years, with increasing integration of different types of

IP counteracted by the increasing (global) fragmentation of the production process.

- The innovation process has become highly complex and expensive, and has moved towards a 'simultaneous' model. Many modern inventions are complex amalgamations of hundreds of existing or new component inventions.
- The important role of public investment, particularly in Australia, where many inventions have been publicly funded. The table at the start of this section highlighted some famous cases.

The innovation status of Australia remains unclear. While many path-breaking innovations have been developed here, Australia remains a relatively small contributor to global innovation, and is more often thought of as a fast-follower rather than a first innovator.

The IP system as it currently stands is subject to abuse and coercion, not only among companies, but also by large corporations against sovereign governments.

Several authoritative voices have also called for a review of Australia's IP policies. For example, Peter Drahos has warned against 'regulatory ratchet' that successively increases IP protection

**Table 4.3: Arguments for and against stricter IP laws**

For	Against
1. IP incentivises innovation	1. Current system is overly complex and prone to abuse
2. Facilitates economic growth	2. Loss of welfare and resources through excessive litigation and 'patent trolling'
3. Useful in long-term strategic planning, especially in relation to overseas operations	3. Places excessive financial burden on small innovator firms
4. Facilitates further innovation through knowledge sharing & technology transfer	4. Blocks innovation by preventing access to knowledge and information
5. Helps firms by allowing them to compete on brand reputation rather than price	5. Lowers standards for inventiveness
6. IP, particularly brands and trademarks, are a valuable financial asset in their own right	6. Lowers competition and allows excessive prices and ensuing exploitation, especially in case of pharmaceuticals
7. Protects consumers from counterfeit or pirated products, which may also be dangerous for health or life.	7. Many modern path-breaking inventions, such as GPS, Wi-Fi, radar, etc. have resulted from public investments.

Sources: Moir, Drahos 2014; PwC 2014c.

## Box 4.2 Intellectual property and free trade

The potential gains from free trade agreements can be worthy. But a 'globalisation of regulation' can also result at times and undermine the gains. Two cases illustrate this complexity and the need for care.

First, Australia enacted plain-packaging laws for tobacco in December 2011 to reduce the rate of smoking and to improve the long-term health of Australians. The adverse impact of smoking is well-established and accepted, and backed by credible scientific evidence, and Australia is the first country in the world to enact such laws.

However, Phillip Morris (PMI)—one of the world's largest tobacco companies—sued the Australian Government in the High Court in response to this law, because according to PMI, this undermined its trademarks<sup>1</sup>. The legal action was launched under the 1993 Agreement between the Government of Australia and the Government of Hong Kong for the Promotion and Protection of Investments (Hong Kong Agreement). The High Court ruled in the Australian government's favour.

Since then, PMI has been engaged in an active international campaign to oppose Australia's tobacco laws in the World Trade Organisation (WTO). However, since it cannot directly bring cases in the WTO, it, and the tobacco industry in general, has enlisted the support of the US Chamber of Commerce and several developing countries<sup>2</sup>. For example, Ukraine, Honduras, The Dominican Republic, and Cuba, through support and active lobbying by the US Chamber of Commerce, have all challenged Australian anti-smoking laws in the WTO.

Such an action was made possible because some trade agreements have clauses that allow foreign investors to sue sovereign governments on the grounds that a law of policy 'harms' their investment. Often this investment represents a company's intellectual property. This is a clear illustration of how intellectual property agreements can be used by multinational corporations to undermine national sovereignty and a nation's ability to enact purely domestic laws in their public interest.

Second, intellectual property and global trade agreements have been used by some multinational corporations to (legally) shift profits out of Australia in order to avoid paying taxes<sup>3</sup>. The full extent of tax losses due to multinational profit shifting is estimated, according to testimony given to the Senate Economics Committee, to be around \$60–70 billion annually<sup>4</sup>, or around 1% of GDP.

This is a significant loss to the national exchequer. While the incidence of tax losses due to profit shifting has received much public attention, the key role of IP laws and agreements in facilitating this has been largely ignored.

IP provisions in international trade agreements are a complex and highly technical area, but in essence allow multinationals to 'park' their intellectual property assets in subsidiaries based in low-tax countries such as Bermuda, Cayman Islands, Ireland and Singapore. The spread of intellectual property rules to virtually all countries through multilateral and bilateral trade and tax treaties provides multiple options for routes and combinations of IP assets.

It is important to note that intellectual property in low-tax jurisdictions is most times not the result of research conducted there, but these are used for complex relicensing arrangements with other countries. Resultant profits arising from these assets, in countries such as Australia, can then be shifted back out legally with little or no tax paid.

1. Attorney General's Department, <[www.ag.gov.au/tobaccoplainpackaging](http://www.ag.gov.au/tobaccoplainpackaging)>.

2. <[www.nytimes.com/2015/07/01/business/international/us-chamber-works-globally-to-fight-antismoking-measures.html](http://www.nytimes.com/2015/07/01/business/international/us-chamber-works-globally-to-fight-antismoking-measures.html)>

3. <[www.canberratimes.com.au/comment/australia-must-break-the-shackles-of-intellectual-property-in-ftas-20150416-1mmcnr.html](http://www.canberratimes.com.au/comment/australia-must-break-the-shackles-of-intellectual-property-in-ftas-20150416-1mmcnr.html)>

4. Hansard 2015, *Senate Economics References Committee*, 9 April 2015.

levels without any systematic analysis of costs and benefits (Drahos 2001). The Harper *Competition Policy Review* (2015) recommended that 'trade negotiations should be informed by an independent and transparent analysis of the costs and benefits to Australia of any intellectual property provisions'<sup>1</sup>.

Trade agreements, especially bilateral or preferential agreements, may be promoted by

forecasts of significant benefits that could accrue to participants, yet these may not be realised or found in the (all too rare) ex-post evaluations conducted. Box 4.2 illustrates how, at times, the benefits of free trade agreements may be diminished—in this case through intellectual property tools.

1. Harper *et al.* 2015, *Competition Policy Review*, recommendation 6.

#### 4.1.4 Market institutions— micro-economic reform

The balance of public and private provision is the stuff of history and of ongoing contemporary evolution and change. Each has enduring strengths and weaknesses as forms of organising economic and social activities, and when blends of the two and overlaps are factored, and the third sector of community organisation is allowed for, the complexity is enhanced.

In Australia there has been a general presumption for much of its modern history that there will be principal reliance upon the market for the predominance of economic activity, but that this will operate alongside a range of core government functions and also within government specified settings that underpin the operation of markets to endeavour to ensure they deliver in the national interest.

At times the government settings can go so far as to inhibit the efficient operation of the private market too much. This was the judgement on the evolution of the public sector role and of associated regulation that underpinned the era of ‘micro-economic reform’ that commenced on a comprehensive basis in the 1980s and continued into the new century. It saw substantial review of legislation, regulation and public finances such as to seek to free up a range of market operations or make the ongoing government role more market-consistent.

The long period of sustained income and employment growth that ensued for Australia and the resilience that the economy displayed in the face of various external financial crises has been widely attributed to this reform process. This is not to say the process explains all or that it advanced all that matters. But from a period when the then Singapore Prime Minister Lee Kuan Yew bluntly warned Australians that they were on the road to becoming the ‘poor white trash’ of Asia, the situation has changed and liberal economic reform is seen as playing a significant role in avoiding at least this outcome to this time.

Further reform of this type can still be envisaged. Previous efforts were incomplete in many areas and changing circumstances and lessons from experience define new opportunities for enhancement.

Common areas specified in public debate for such attention include such institutions underpinning or affecting market operation as international agreements affecting global trade in goods and services, workplace relations regulation, taxation structures and competition policy. These are not without controversy, partly as to their actual impact but also as to their nature and role beyond narrow economic efficiency considerations.

That said, there are a wide range of studies that seek to evaluate at least the economic impact of changes or reform in these areas, if more were to be contemplated. Much of the evidence here has been gathered in various policy reviews, including those comprehensively listed in the Compendium of National Reports compiled for this project and reported in Chapter 2 of this report. Most conclude that further such reform is desirable and would deliver significant additional economic benefit. For this to eventuate, care must be taken with the nature of the change and due consideration given to costs as well as benefits, including non-economic matters, and to implementation capacity.

For this ACA report, the Independent Economics commissioned work has tracked recent policy changes, policy review and estimates of impact in these principal areas of institutional change for market operation. It has concluded that the following applies:

##### Free trade agreements

With virtually no progress for many years in liberalism of international trade at the global level through the World Trade Organisation (WTO), Australia has been pursuing free trade agreements (FTAs). FTAs aim to boost two-way trade and investment flows. The pace of FTAs has stepped up since 2013, and the current situation is as follows.

- Australia has FTAs in force with:
- New Zealand

- Chile
- US
- South Korea
- Malaysia
- Singapore
- Thailand

Australia has concluded FTAs with:

- China
- Japan

FTAs are under negotiation with:

- the GCC countries
- India
- Indonesia

According to the Independent Economics report, the potential economic impacts on Australia from FTAs have been modelled by Tulloh, Jiang and Pearce (2014) of the Centre for International Economics (CIE). In the widest scenario, the estimated gain in exports is 2%. This included gains of 26% for agriculture and 2% for manufacturing. It also included declines of 2% for mining and 3% for services. The gains in agriculture and manufacturing from improved access to export markets would strengthen the Australian dollar, which would account for the losses in mining and services exports. The simulated gain to GDP was 0.15%. It is concluded that these results suggest that FTAs are a relatively small reform for the economy as a whole, but are important for agriculture.

The potential FTAs that were included in this CIE modelling are an FTA between Australia, China, Japan and South Korea and a further FTA between Australia and the EU. Since the time of the CIE study, Australia has concluded FTAs with South Korea, Japan and China, but not with the EU.

The outcomes of Trans-Pacific Partnership agreement negotiations are not yet known, at the time of writing, but public debate has emphasised that careful scrutiny is always needed for such arrangements to ensure that they deliver advance and are not diminished by clauses that protect special interests more than they advance the public interest.

Armstrong (2015) has estimated that the Australia United States Free Trade Agreement which came into effect in 2005 reduced Australian and US trade with the rest of the world *and* as between the parties.

### Competition policy

The final report of the Harper *Competition Policy Review* (2015) made many recommendations for improving competition. Some of the more important recommendations of that recent Review were as follows:

- greater competition in the provision of human services, including health, education, aged care and job services
- cost-reflective, direct pricing of road use
- removal of barriers to entry to pharmacy from location and ownership rules
- deregulation of retail shopping hours
- opening of coastal shipping to competition
- lifting restrictions on the number of taxi licences and opening the industry to competition
- removal of restrictions on parallel imports
- less prescriptive and more responsive land zoning.

The review did not undertake any modelling of the economic impacts of these recommendations. However, it cites previous modelling of competition policy reform as giving some indication of the potential benefits. These include an estimate in 1995 that the Hilmer competition policy reforms could provide a gain in GDP of 5.5% and a 2005 estimate that implementation of Hilmer to date had added 2.5% to GDP.

### Workplace relations

Workplace relations is an especially challenging area to consider under micro-economic reform. At its core the working lives of Australians are influenced in major ways by the regulatory settings of government in this sphere. Presently in Australia, the Productivity Commission is reviewing the *Fair Work Act*.



Recent history has seen progressive deregulation measures in workplace relations through legislative change in 1993, 1996 and 2005. This three-phase process was then partially reversed through the *Fair Work Act 2009*.

This pattern of recent change in Australian labour market regulation is reflected in movements in Canada's Fraser Institute's index of labour market regulations. This index has a possible range of values from 0 to 10, with 10 for the lowest level of regulation. The Australian index increased from 5.43 in 1995 to 8.36 in 2005, before declining to 7.27 in 2011 following the implementation of the *Fair Work Act*.

This value of 7.27 leaves Australia with a less regulated labour market than either France (5.89) or Greece (4.29), by this measure. However, it leaves us with a more regulated labour market than Japan (8.33), the UK (8.27) and the US (9.01).

The components of the Fraser Institute index provide a guide to possible directions for ongoing reform possibilities:

- hiring regulations and minimum wages
- hiring and firing
- collective bargaining
- hours regulations
- mandated cost of worker dismissal.

However the Fraser Institute Index measurements and methods of aggregation are contested, as rankings and ratings often are, and alternative measures can also be looked at to provide a comprehensive assessment.

Accordingly a balanced and thorough review by the Productivity Commission here will be very important in allowing properly informed debate as to further micro-economic reform possibilities in such an important but highly contested area.

## Taxation

The shortcomings in Australia's tax system have been analysed in *Australia's Future Tax System Review* (Department of the Treasury 2009), otherwise known as the 'Henry Review', and the Australian Government's *Re:think—tax discussion paper* (Department of the Treasury 2015).

Those reports were supported by economic modelling by KPMG Econtech (2010) and Cao *et al.* (2015). This modelling quantifies the costs to consumers of the distortions to economic decision-making resulting from major taxes.

As explained in the study provided for this ACA Report by Independent Economics, most taxes have disincentive effects that distort decision-making by businesses and/or households and hence have economic costs that ultimately reduce household living standards.

A common way of summarising this cost in economic terminology is the excess burden of a tax. This refers to the loss in living standards as a result of the tax, over and above the revenue raised. To the extent therefore that a tax policy scenario involves a shift from high-burden to low-burden taxes, it can be expected to increase consumer welfare.

However tax reform is fraught also with wider issues such as the impact on inequality within the tax-transfer system, as discussed in detail in section 4.3 below. Thus, for example, if the aim is to maintain the current progressivity of the tax-transfer system, there may be little efficiency benefit from attempting to use an increase in the rate of GST to fund a cut in personal income tax. This is because to maintain overall progressivity, the cut in personal income tax would need to be accompanied by an increase in the progressivity of the personal income tax scale, and this would be likely to largely nullify any potential efficiency gain. Such design issues need to be confronted in examining the reform possibilities.

Based on the Henry Review, *Re:think*, and modelling of the economic costs of different taxes, it may be suggested that five particular options for tax reform have emerged with a degree of common ground amongst economists in discussion. These are:

- reduce the company income tax rate to a more internationally competitive level
- abolish stamp duty on conveyances



- make more uniform the taxation of income from different assets, with a particular focus on overhauling the franking credits system
- broaden the base of the GST e.g. to include basic foods
- eliminate bracket creep by automatically indexing the personal income tax brackets to wages, while maintaining discretion in adjusting the rates of tax that apply to the brackets.

Further options get raised also with respect to reform of:

- negative gearing provisions
- capital gains taxation
- family trust provisions
- tax free superannuation.

These and other possibilities indicate that constructive review can be pursued and that follow on from the forthcoming Tax White Paper could be a very important component of further micro-economic reform for the Australian economy, and with implications for wider society concerns too.

### Taxes as an effective source of funds

The issues paper put out by the Department of Prime Minister and Cabinet, *A Federation for our Future*, states that the Federation White Paper currently underway will be closely aligned with the White Paper on the Reform of the Australian Tax System. This is because there is a close linkage between the issues of Federalism reform, taxation arrangements, and national productivity performance. In fact, it would be accurate to say that national productivity and competitiveness cannot be fully improved without reforming the federation, which cannot happen without reforming the tax system, which in turn cannot happen without addressing the relative importance of direct and indirect taxes.

Evidence in section 4.1.1 above indicated that dominance of the central government is associated with compromised competitiveness outcomes for the nation. These are causes for concern in themselves, but Australia's

taxation system itself can also be questioned more generally when compared against OECD benchmarks:

- The taxation regime in Australia is highly skewed in favour of direct taxes; its corporate tax rates of 30% are amongst the highest, and its indirect tax (GST) of 10% are amongst the lowest in the OECD. Only Canada (which allows states to raise their own resources through State Income Taxes), Japan, and Switzerland have lower rates for VAT, while the OECD average was 19.1% in 2012.
- The revenues from income and profit taxes as a proportion of total taxes, is 58.1%. This is the second highest in the OECD (surpassed only by Denmark), and is well above the OECD average of 33.6%. GST collections as a proportion of total taxation are 28.1%, and lower than the average of 32.8%.
- Income and profit taxes, as a proportion of GDP, were 15.9%. This was the fifth highest in the OECD, after Denmark, Norway, New Zealand, and Iceland.
- Australia's taxes on general consumption and value-added taxes (VAT), both as a proportion of total taxation, are 12.4% and 12.1%, respectively (It should be noted that VAT is equivalent to the Goods and Services Tax (GST)). However, OECD's reported values for Australia for VAT as a proportion of GDP (Consumption Tax Trends) vary from the GST as a proportion of GDP (Revenue Statistics). Why this is so is not clear, but it is flagged here for completeness. The basic pattern is largely unchanged). Its VAT as a proportion of GDP is 3.3%. In each of these cases, Australia's performance is second-to-last within the OECD, with only Japan recording lower tax collections in each of these categories.
- Australia's tax-to-GDP ratio increased for each of the three decades between 1965–95, and peaked in 2000, i.e. before the fully-fledged onset of the mining boom. Since then, it has shown a general downward trend.

The OECD data further shows that not only is Australia's tax-to-GDP ratio amongst the lowest in the OECD, but also that Australia has recorded

one of the highest reductions in the tax-to-GDP ratio between 2007 and 2013. During this time, Canada, US, UK, and Korea experienced smaller falls, while Japan, Germany, Switzerland and France all increased their tax revenues as a percentage of GDP. Clearly, the high level of direct taxation has not yielded the level of resources that are typically available to other advanced and developed economies.

The relative importance and effectiveness of direct and indirect taxes have been the subject of much research and debate for over 50 years now. Indirect taxes like VAT have become increasingly important since they were first introduced in the mid-1960s. Back then it was adopted by a dozen or so countries, but now almost 160 countries apply VAT as an important part of their tax regimes. VAT's attractiveness arises from the fact that it is far less distortionary than are direct taxes. The distortions arise because they alter the relative prices in an economy and directly target economic activity, and in turn affect resource allocations and the incentives to engage in productive activity.

Australia was a relative latecomer to the indirect taxation field, having implemented the GST only in 2000. While this has improved the situation somewhat, the policy is more notional than real, is replete with exemptions, and has no clear settled formula for distribution of revenues. Distribution does not adequately take into account how well different states are already doing in terms of revenue collections from their industrial or resource sectors.

It is the case that a rebalancing of the tax system is an important consideration for the reform of the federation. The outcomes of the present tax and federalism reviews are therefore crucial for the promotion of Australia's comparative advantage. The opportunity must be taken to enhance the operation of the federal system and also the taxation arrangements. An estimated \$60 billion improvement in GDP depends on it (Elnasri 2015).

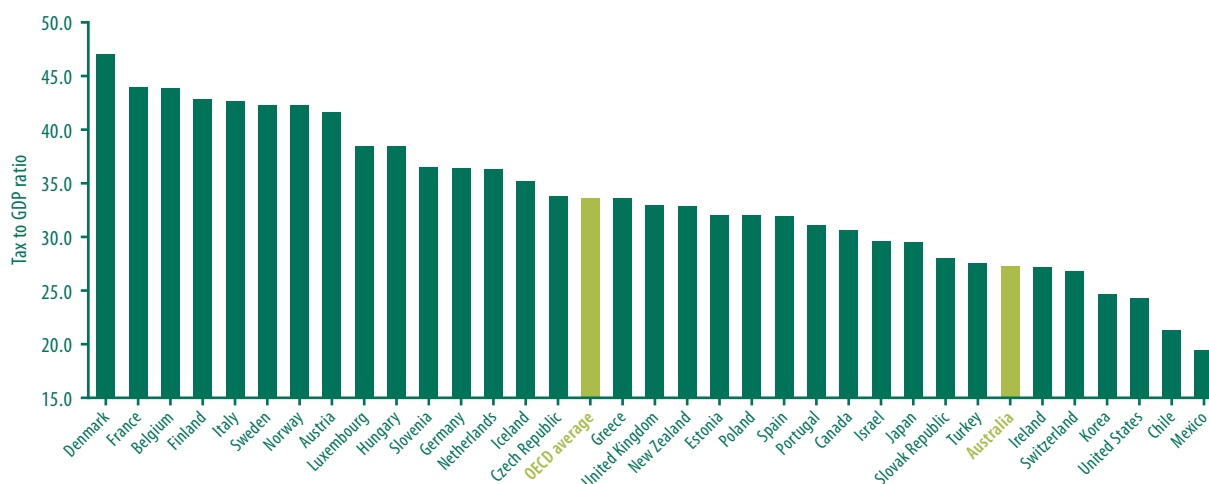
#### 4.1.5 Cultural institutions

This section looks at the role of cultural and creative institutions, while subsequent sections will separately consider issues relating to cohesion and inclusions in a culturally diverse society. The primary resource for this section is a commissioned report done by Justin O'Connor and Mark Gibson for the ACA project. This section draws extensively on the analysis contained in that report.

As described earlier, institutions are formal rules and informal norms that constrain actions and influence incentives in societies. Along with political, legal, and competition-based institutions, cultural institutions also form a critical fourth pillar of any nation's institutional architecture.

The term 'cultural institutions' represents several aspects. At a broad level, it relates to how a nation manages its cultural assets and diversity, which may be both formal institutions and wider traditions of ideas and understandings about the operation of the society. In a more tractable

Figure 4.5: Tax-GDP ratios, OECD countries, 2012



Source: OECD 2014e.

form, they include not only creation of economic value through creative industries (including arts, advertising, and media, etc.), but also how the broader cultural sector is regulated and managed and how it operates. Such institutions are of high importance to any developed and advanced economy, as encapsulated in a modern literature associated with authors such as Florida (2002).

Cultural and creative institutions influence, amongst other things:

- a sense of national identity and narrative
- how the creative potential in an economy is tapped and utilised
- the quality of life enjoyed by the citizenry
- how people from diverse backgrounds are valued for their skills and contribution potential
- the level of inclusion and cohesion in society, and hence a sense of dignity and acceptance perceived by members.

These issues are in turn made important given such 'stylised facts' as the following:

- Australia is amongst the most culturally diverse countries in the world, with a quarter of the population born overseas
- Australian cities are rated amongst the world's best and most liveable, while Australia itself is a predominantly urban nation
- a dramatic and ongoing evolution of internet and communication technologies, leading both to a 'clash of cultures' and opportunities for productive engagements in the broader region
- potential for a successful creative industry that can carve out its place in the world.

The report for this project by O'Connor and Gibson presented a critical assessment of how the creative and cultural sectors in Australia are managed and regulated. In particular this assessment identified salient issues for enhancement of the role of culture for an even greater contribution to the nation's wellbeing than at present. Six of the most important issues can usefully be summarised here.

The first issue relates to the evolution of culture from an essentially public good to one that is subject now to market forces. Various notion of 'culture' have been used in public policy since the early 19th century, many of which exist to this day. These include publicly funded education, cultural facilities such as libraries and concert halls, and public broadcasting, among other things. Cultural policy has never just been about 'the arts' but about creating citizens. However, the sheer commercialisation of cultural goods and proliferation of cultural consumption, and the cultural policy's close association with state finance, have positioned it at the epicentre of the more fundamental debates on 'small government-free market' narratives that have dominated politics in recent decades. It has provoked numerous controversies as to what kind of culture should states support—if at all—and, given the increased role of the commercial sector, how they should do this.

These developments have created new challenges for existing:

- arts policies (based around direct government funding for traditionally legitimised 'high arts')
- urban policies (where culture and leisure are now major requirements for citizens, visitors, skilled workers and inward investors)
- educational provision (where media, communications and creative arts programs have multiplied despite many obstacles placed before them by governments and traditional universities)
- communication policies (the increased flows of transnational migration which have increased demand for global media flows and undermined the closed 'national identity' of many public broadcasting systems).

The cultural sector should be framed as a complex service sector, involving producer, social, and personal services as well as links to manufacturing and wholesale/retail trade. In this way it can be compared with education and health as core public goods.

The second issue relates to how growth in internet and communication technologies are creating regulatory and institutional challenges for cultural and creative sectors. Growth in internet and communication technologies has arguably upended the traditional business model of how information and entertainment are conceptualised, created, and delivered. Consider, for example:

- the proliferation of new channels of communication through new production and distribution technologies—notably the Internet
- the globalisation of media industries—in terms of distribution and production—with the consequent demands for access to national markets
- the convergence of broadcast media and other communications technologies, which has seen new and more powerful players enter national and global media landscapes
- a proliferation of independent media producers operating in the orbit of the larger national (public and private) and global media companies
- national broadcasting configurations (based on government monopoly over relatively scarce ‘airspace’ or ‘bandwidth’)
- a range of other legal regulations of content (classification systems, intellectual property, distribution of royalties and various rights-based monies).

Third, there are problems associated with the funding of and access to cultural/creative sectors and how people are trained for these. The rising importance of these sectors ties in well with the common narrative that post-industrial societies will essentially be service-driven, and often also highly creative. Whether or not this is true, modern production is characterised by a seamless merging of production, design, and services into an integrated offering. However, government educational policies relating to the tertiary education sector are evidently in transition, though the path ahead is still uncertain.

According to the O'Connor and Gibson report, even though universities have sought greater engagement with industry and more recognition of the creative dimensions of the educational experience, and though arts and humanities subjects have been extremely popular as subject choices, these areas have been experiencing both relatively reduced funding and also reduced real public funding per student. Moreover, the control mechanisms in universities have become increasingly linked to the quasi-market mechanism of key performance indicators (KPI) and finance indicators resulting in a large ‘creative deficit’. That is, universities have become increasingly uncoupled from direct, flexible and creative engagement with the cultural sector.

At this stage, the impact of proposed further fee deregulation—which according to the report will increase disproportionately for creative arts and humanities—on the recruitment of ethnic minorities and lower socio-economic groups to these subjects is not clear. Nor is it clear what the impact of this will be on existing inequalities in access to employment in the cultural sector.

Another important related problem is that the cultural or creative industries have been a peripheral concern of the arts and cultural funding bodies, who see this as an economic add-on (often in the form of creative industries) rather than as a reconfiguration between a full-range of cultural products, services, practices and institutions and traditions which has combined social, cultural and economic value combined in complex ways. This imbalance can potentially undermine traditional forms of knowledge and culture that may be perceived as possessing a ‘smaller economic value’.

The cost of such mindsets can be illustrated in the important case of indigenous knowledge. Western culture is dominant and indigenous culture has led a more precarious existence including whether it is to conform to the materialist model or otherwise. A cost could be compromise to a uniquely holistic approach to knowledge and culture, just at a time when universities themselves, for instance, are struggling to move toward more inter-disciplinary approaches and perspectives. Such approaches are

much sought after by industry and government decision-makers. Discussion over an Indigenous Learned Academy that could support and enhance one of the world's most long-established approaches to such knowledge has not advanced in Australia, even though new Academies in law and medicine have made an appearance in recent times. This illustrates the dilemma.

Fourth, the importance of the sector, or the importance of Asian growth for the sector, is apparently neither acknowledged in broader public narratives, nor is receiving adequate policy attention. This latter point was made evident in the compendium of national reports (reviewed in Chapter 2).

The rise of Asia, and demands by its burgeoning middle-class for aspirational consumption, will create both opportunities for the creative industries, as well as mandate an investment in new 'cultural-type' skills. To this end, effective cultural institutions would not only allow Australia to tap into and leverage existing cultural resources within the nation, but also facilitate skills development through immigration and wider linkages, as also discussed below in section 4.3.

With regards to the wider contribution to Australian society, O'Connor and Gibson emphasised the links between a flourishing cultural economy and the attractiveness of Australia for skilled migration from Asia. Rather than the specific 'brand' or 'image' value provided by Australian arts and culture on the international stage, they suggest a kind of 'deep branding' as the best route for Australia. That is, the best means of engaging with the growth of the Asian cultural (and other) economies would be the promotion of an open, welcoming democratic, egalitarian country in the Asia Pacific.

One of the key obstacles in addressing this 'policy deficit' is the dominance of what is termed the 'economic imaginary', where economic considerations (such as contribution of cities to innovation, competitive and growth) determine policy attention. While the cultural sector is of strategic importance to the nation, a simple reliance on this perceived importance will not get the necessary attention, which is itself a scarce resource. The reality is that attention must

be competed for in an era of scarce resources and competing agendas, and this can best happen by articulating and demonstrating the economic benefits of particular policies.

The opening up of Sydney Opera house, the proliferation of large and niche festivals, the popularity generated by the new approaches to art galleries as in MONA, Hobart; Queensland Museum of Art, Brisbane and the Melbourne Now Exhibition at the National Gallery Victoria; all suggest Australia could take a lead in a new democratic non-patronising approach to building new audiences for the arts.

Fifth, it is apparent that a major problem arises from the traditional orientation of Australia towards America, the UK and Europe in terms of its cultural reference points. This is not adequate for the needs of the Asian Century, and would demand an incorporation of a different set of norms and value systems (which are an integral component of cultural institutions). This lack of Asian capability was also identified as a problem in the commissioned report done by PwC on skills and management capability. The *Asian Century White Paper* set out to address this—but was somewhat short on ideas as how this cultural reorientation might take place.

The role of arts and culture—Australian and Asian—in this process were very much underplayed here. However, the example of Chinese visual art can stand as a good case. Australia (through its galleries, art networks, academics and cultural entrepreneurs) has developed strong connections in this area, and Australia itself has been seen as a destination for Chinese artists to live and work. Chinese visual art, increasingly showcased in the proliferating gallery infrastructure of the large Chinese cities, has become one of the main ways in which cultural audiences are engaging with China.

Finally, mechanisms for promoting Australian culture and creativity on a global scale were found to be severely lacking. This in turn has resulted in an underperformance in Australia's international trade in cultural goods and services. As is highlighted later in this chapter, Australia has a large trade deficit in cultural goods as compared with other advanced countries.

The report found that Australia lacks promotional agencies in terms of cultural diplomacy and ‘creative export’ development. It is disinvesting in arts and cultural economy at a time when the market in the region is growing. This is of particular concern since many Asian economies—led by China—have targeted cultural exports for large scale strategic investment.

In light of these points, consideration can be given to the creation of an agency along the lines of the British Council, the Goethe Institute, Institute Francais, Cervantes Institute, and the Confucius Institute. Not only are these important ‘soft power’ or cultural diplomatic institutions, but the absence of an equivalent Australian agency has led to serious deficiency in adequate external recognition of its cultural vitality and tradeable cultural goods and services.

## 4.2 Investing in Australia’s future

### 4.2.1 A strong and resilient skills profile

Australia is reasonably well respected for its educational quality and the overall capability of its population. Australia has an experienced, educated, and highly skilled population. The strength of the Australian workforce capability comes through clearly not just in reports and

domestic evidence, but in global perceptions of Australian innovation and skills capabilities as well.

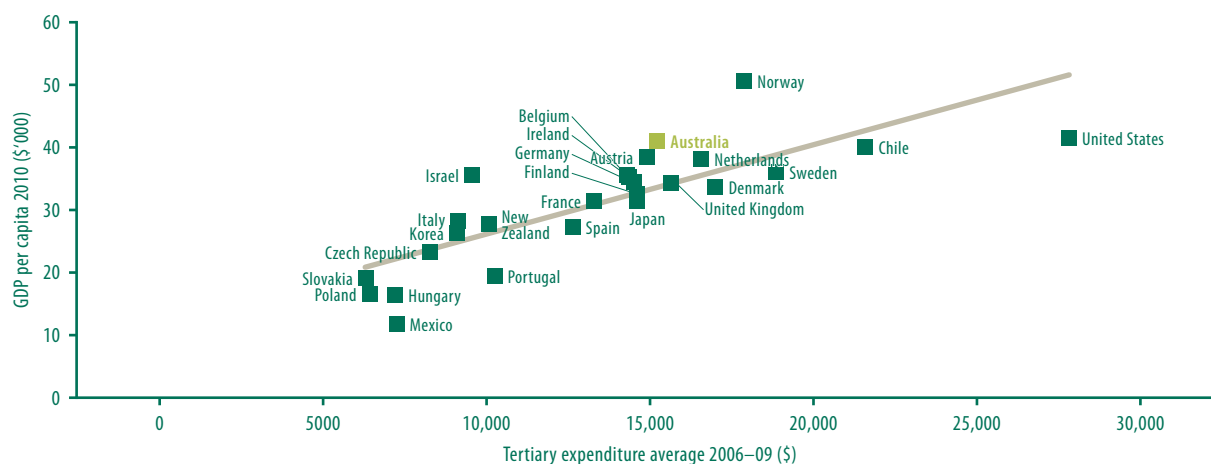
At the aggregate level, as Figure 4.6 shows, Australia is already doing well in terms of GDP per capita outcomes relative to tertiary expenditures. It has had one of the highest per capita GDP levels in the OECD, and higher than that of countries with comparable levels of expenditure on tertiary education.

Australia’s higher GDP per capita for its given tertiary expenditure level is a result of a number of factors, of course, including the nation’s natural resource wealth contribution. Part of the explanation may also be found in the operation of a relatively efficient and effective tertiary education system. Australia ranks highly in system rankings such as the Lisbon Council (Ederer *et al.* 2008) and Universitas 21 (Williams *et al.* 2015).

At the same time extra tertiary expenditure can also still pay-off for GDP per capita, a relevant consideration for a post-mining investment boom environment for Australia. Statistical analysis conducted for this project (Elnasri 2015) does find that controlling for other starting point circumstances there is a significant positive benefit from higher tertiary expenditure on average for OECD countries.

This pay-off may also be pertinent if quality of education is factored in more explicitly. One mechanism for Australian system efficiency, as measured, has been rising student-staff ratios. Given declining student assessment of the Australian education experience relative to key

Figure 4.6 GDP per capita and tertiary spending across OECD



Source: Elnasri 2015.

comparators (and competitors) such as the US and Canada (ACER 2014), attention to enhanced per student resource provision may become important in national policy if advantage is to be sustained and advanced.

Education does not just result in better GDP outcomes but also, as evident from the next chart below, also results in higher earnings premiums for people, and that these premiums usually increase with levels of education and as people get older (this is probably reflective of accumulated experience).

For example, relative to Year 12 earnings there are gained benefits even for 25–29 year olds, regardless of whether they have post-graduate, bachelors or diploma qualifications. But for those in their early 50s, those with post-graduate education earn an average 65% more than their counterparts with only a Year 12 education, while those with bachelor's degrees get an extra 54%. This clearly shows the long-term pay-offs to education, even in purely private terms.

The education system is a national strength, and raises the natural question: why fix something that already appears to be working well. From a comparative advantage perspective, a more pertinent question is whether this is enough to ensure Australia's competitiveness over the long term, or whether there are emerging risks that may erode this advantage. This report, following many others before it, takes the view that a strong and robust skills capability is integral to Australia's continuing wellbeing and prosperity in the 21st century.

It is widely acknowledged that the mining investment boom, which helped deliver two decades of uninterrupted growth for Australia, is coming to an end, and will dissipate the large gains the economy has enjoyed over this time. It can also be reasonably expected that this transition will by itself lower the per capita GDP from its historically high levels.

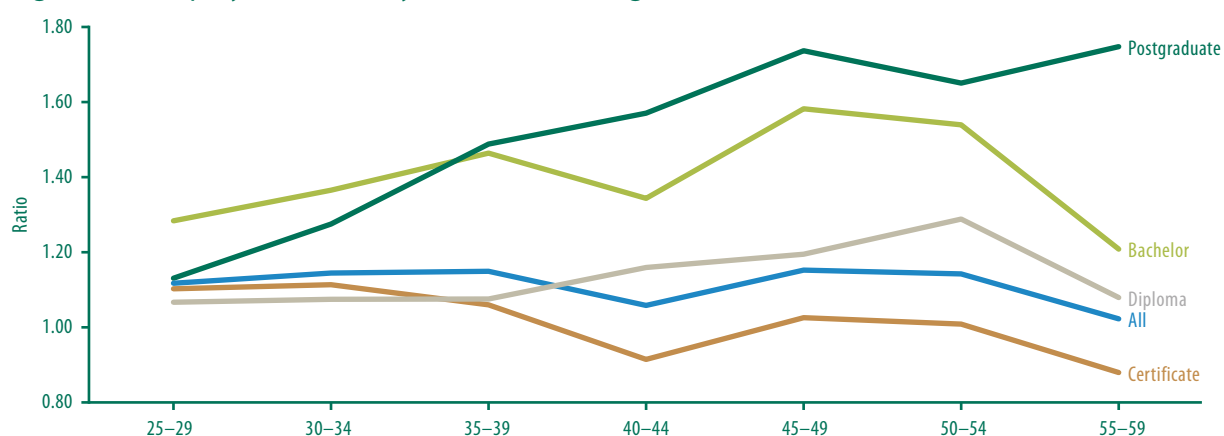
Both McKinsey (2012) and OECD (2012) have found that the mining boom has masked a noticeable decline in productivity, and that reversal of this productivity decline is key to Australian sustainable prosperity.

If Australia is to maintain its high standard of living, greater general support and enhancement for education and training is needed. This has been the subject of considerable review, as mentioned in Chapter 2. In addition, it is worth recording that three important particular considerations also arose during this projects discussion. They are:

- the impact of technology and globalisation on the 21st century economy, and the types of skills that will be needed, and indeed valued, in such an environment
- the rise of Asia and its strategic implications for Australia
- the issues of balance across study areas and participation.

Each of these is intimately linked to the development of a multi-dimensional skills capability. As is detailed in the subsequent sections, STEM skills play a critical and central

**Figure 4.7: Employee income by education and age, 2011–12 (ratio)**



Note: Ratio of average annual employee income by level of education and age relative to year 12 completion only.

Source: Calculations based on data from NATSEM 2012, *Smart Australians* report.



role in this capability, but these need be complemented with effective training in HASS, management and vocational training. A report done by PwC for this ACA project has also strongly emphasised this point, as did the SAF04 report (Bell *et al.* 2014) on the role of STEM in lifting Australia's productivity.

At the same time there is valid concern over the quality of outcomes in both HASS and STEM. In STEM for instance Australia has in the past ranked in the top ten countries for PISA rankings. But in math the average PISA score has declined from 524 in 2003 to 514 in 2009 and 504 in 2012. For HASS, reading scores have declined from 528 in 2000 to 515 in 2009 and 512 in 2012. Also Australia has unusually high variance across socio-economic status for such scores (OECD 2014d).

Maintaining and enhancing strength across educational skills should be a major national priority to underpin the building of comparative advantage.

### Technological revolution

The ICT revolution and globalisation are pervasive forces that have changed the very nature of global production and competition. Skills and capabilities that are highly prized at a particular point in time can be rendered obsolete in a mere few years. Two main ways in which this has happened are:

- rise of global production sharing and networks
- integration of design and services into the production process.

Advances in production and communication technologies have allowed industries to slice up the value chain into finer segments and tasks, and to spread the activities across several countries according to their respective specialisations. This is arguably the reality and the future of global economic activity.

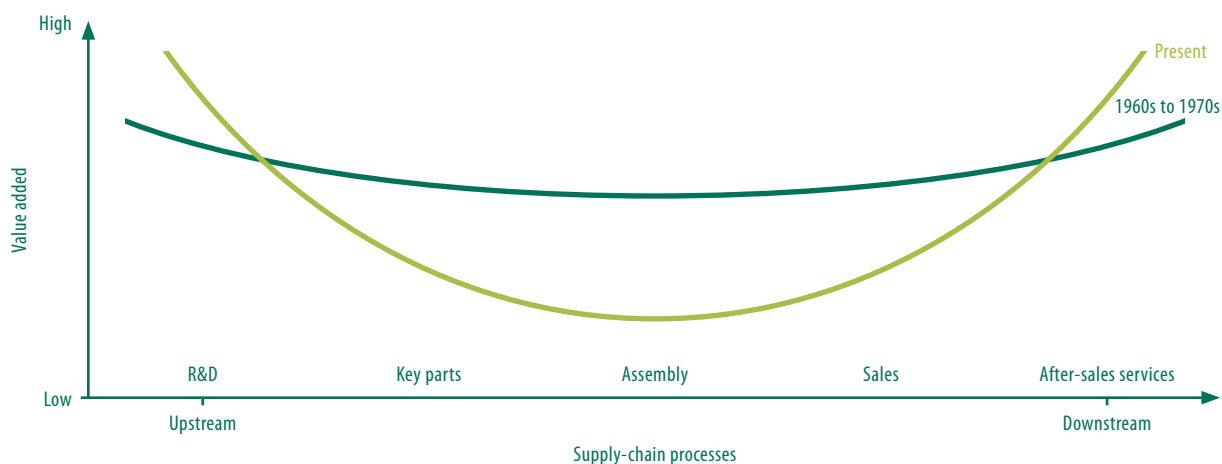
As Figure 4.8 (Roos 2014) shows, however, the value-addition is not uniformly distributed, with R&D and after sales services capturing the greatest share of value-add. These are activities that advanced economies have particular comparative advantage in and can therefore specialise in.

This presents three important imperatives for any developed nation (like Australia) aspiring to secure sustained prosperity and wellbeing in the 21st century:

- it must effectively embed itself into global production networks in a strategic way
- within these networks, it must specialise in the high value-added, skill-intensive functions. This is due to the high relative costs of routine manufacturing associated with a highly educated workforce
- it must be able to develop global marketing opportunities, and to manage a global fragmented production chain.

These would require Australia to develop an advanced STEM capability, without which it would find it difficult to succeed in a highly competitive global market for advanced products. However, other disciplines would strongly complement an effective STEM profile too.

Figure 4.8: 'Smile' curve



Source: Adapted from Roos 2014.



Vocational training in particular is closely linked with STEM, and in fact helps to provide an effective pathway for those with practical training into advanced STEM-based education.

Participation in and management of global networks means the development of greater management capability, particularly in relation to strategy, coordination, and transnational relationship management. This evidently is more than is currently associated with the Australian way in major areas of management, as evidenced by the various surveys done for this project.

Globalisation has also increased the intensity of global competition, and has forced companies to differentiate their products, and to move from a traditional focus on selling products to selling 'solutions'.

Firms have to increasingly rely on differentiation of their products and to create recall value in the minds of current and potential customers and clients. This is most often done through high quality service and the non-tangible, creative aspects of the product, such as design, brand name, and trademarks.

These are typically highly creative functions, and the training for these is both science and art. These are also the components of the value chain that command the highest relative values. This in turn has led to a greater reliance on superior designing capability, understanding of customer needs, and effective after-sales support and services. In the words of Jeff Connolly, CEO of Siemens Australia, 'we are seeing design, production planning, engineering, manufacturing, and services merging into one unit, instead of being sequential' (Roos 2014).

The influential UK report, the *Review of Creativity in Business* (Cox 2005), positioned design as the bridge between arts and the engineering sciences. A report on the creative economy done for the ACA project further reinforces this idea of creative input into the production process in most of the traditional, 'non-creative' sectors, where advertising, marketing, software development and interactive content accounts for a significant share of total employment.

As for high quality service, it is a common trend that after-sales support is usually provided

'remotely', often by staff who are sitting across countries, if not continents. This means that not only advanced technical knowledge is needed, but also understanding of cultural nuances and sensitivities, good management and organisation, and in many cases, of different languages. These are of potentially equal importance alongside technical skills.

In the report for ACA (O'Connor & Gibson 2014) it was reported that in 2008–09 the consolidated creative sector accounted for 9% of the national workforce and contributed about 5.6% to the national gross value added. This is significant not just for the direct contribution of the creative economy, but also for the indirect benefits for the broader cultural sector.

However, the report found that policy attention was deficient in this area and relative outcomes were behind other major comparator countries such as US, UK, and Canada. Despite proximity to Asia, Australia still looks to Europe and North America for cultural links.

### Rise of Asia

The rise of Asia is cited as biggest economic trend of the 21st century. Asia's share of world output has doubled in 60 years, from about 20% in 1950s to nearly 40% in 2010. OECD estimates project that Asia's middle class will increase from 28% (of the global total) in 2009 to around 66% by 2030. This presents great opportunities for Australia; modelling done by the Boston Consulting Group (cited by a PwC report on management and skills done for the ACA project) shows that in addition to resources-related business, Asia could contribute an additional \$275 billion to the Australian economy over the next 10 years.

Many Australian businesses have demonstrated an ability to successfully engage in Asia, see Table 4.4.

**Table 4.4: Australian Businesses in Asia**

The ANZ banking group	Linfox Logistics
RMIT University International	The Leighton Group
Hassell	Seek
Jetstar	Orica

Source: PwC 2014c.

These aptly illustrate the possibility of specialisation, effective management, and a successful global strategy.

Research done for this project (including a review of multiple studies) has shown, however, significant gaps and shortcomings in Australia's 'Asia capabilities'. For example, the PwC report on management and skills done for the ACA project, cited a survey of 380 businesses conducted by Asialink and the Australian Industry Group, which found that:

- Asia is considered important to business success, with over half the respondents citing their Asian operations as highly important, and 74% of respondents indicating an interest in expanding into Asia.
- China is the biggest area of interest, with other Asian countries also featuring prominently.
- However, more than half of Australian businesses operating in Asia had little Board or senior management experience of Asia and/or Asian languages.
- Australian business culture is rooted in western, transactional models that emphasised directness and verbal communication. Eastern managers, on the other hand, focused more on relationships and were comfortable with ambiguity.

The SAF03 report on Asia literacy found that 'More than 8% of Australia's population was born in Asia. This is a much higher percentage than in other Anglophone countries such as the US (4%) and the UK (2%). Yet Australia does not make enough use of the networks and linguistic and cultural resources inherent in its Asian diaspora population' (Ang *et al.* 2015).

The PwC report on management and skills done for the ACA project found that overall, large Australian companies are seen by business leaders and advisers as possessing only 'average' Asia capabilities when compared to international competitors. Australian SMEs are also seen (on average) to fall behind their international competitors on their understanding of, and experience operating in, Asian markets, cultural/language proficiency, and dealings with Asian governments and regulators. They also appear

to be behind competitors in the customisation of their organisations, people and products and services to the context of each Asian market.

A further advancement of Australia's skills capability is clearly needed if the nation is to realise these opportunities. In particular, an understanding and appreciation of cultural nuances and the diversity of this region, as well as an ability to handle multiple interpretations and contested narratives, are critical competencies that would allow Australian firms to make significant headways into the wider Asian region. As in the previous section, addressing these challenges would require that a strong capability in STEM-based skills complemented by improvements in HASS, management and vocational skills.

The PwC report further found that Australia's management capability falls behind world standards. This is an important gap that should be filled, since good management is associated with many benefits. For example, good quality management:

- is highly correlated with high exports, sales and productivity
- fosters productive and high-performing workplaces, which in turn help to foster innovation
- prioritise people management as a key goal
- is more responsive to customer and stakeholder needs, thus fostering cooperation and loyalty.

As a result, high performing workplaces were found to be up to 12% more productive and three times more profitable than their peers. Therefore, a strong management capability can directly contribute to Australia's need for improved productivity.

It must be noted that the Australian VET sector in particular is highly regarded by international standards, and represents a genuine strength for Australia. Further investment in and development of this sector could yield rich benefits for Australia, since many Asian economies, including India, are making significant investments to develop their vocational skills sectors, and are looking for international partners to help achieve this.

## Balance in education

A third important consideration for Australian skills development arises from the issue of equity of opportunity and access, particularly for women and minority groups. Women are key contributors to national wellbeing and prosperity, and improving their participation rates and outcomes has been identified as one of the key strategic imperatives for Australia (Daley *et al.* 2012).

The importance of increasing labour force participation for women has become widely recognised in policy discussion. It is helpful though, for a report such as this, to point particularly to issues of participation in areas of study and subsequent areas of employment.

As Figure 4.9 shows, women account for a large majority of enrolments in various HASS disciplines, including health, education, cultural studies, and creative fields. They also represent a majority in natural and physical sciences, as well as agriculture, environment and related services. But issues of whether there is over representation in areas such as health and education and under representation in areas such as IT, engineering and architecture, remain matters requiring closer ongoing examination.

## Immigration

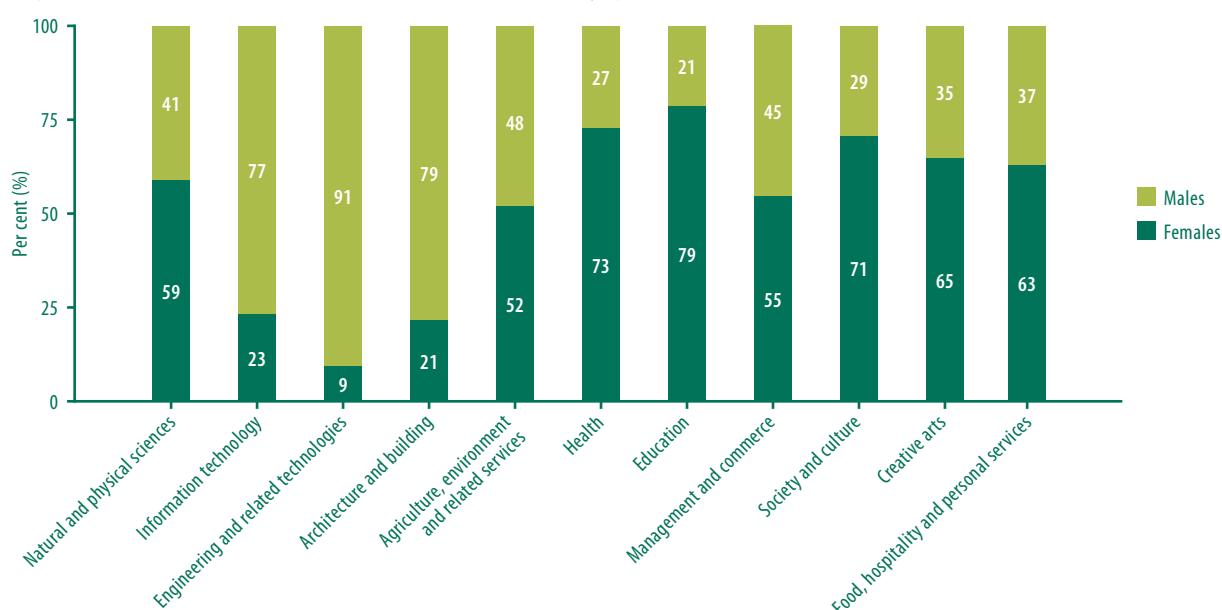
Alongside domestic education and training, immigration has been a major source of skills enhancement for Australia. Some 25% of the Australian population at present is overseas-born and migration has long been a defining feature of Australian development. As such, immigration managed well should be an ongoing source of comparative advantage for the nation. Certainly Australia is widely viewed as more successful than most countries in how it has operated its migration entry and settlement arrangements.

Australia operates a temporary entry regime embracing tourists and visitors, students, working holiday-makers, short-term work entrants and others. It also manages a refugee and special humanitarian entry program, family reunion and a skilled migration program for permanent residency.

The device of visas is the principal vehicle for controlling entry by persons who are not permanent residents, except for New Zealanders who do not require visas. Visa charges apply that are intended to reflect costs of administration.

Each category affects supply of skills in various ways even when that is not the principal intention, as with say refugees in the workforce.

Figure 4.9: Enrolment across the disciplines, by gender



Source: NATSEM 2012, *Smart Australians* report.

Cross-category movement also occurs, such as when international students seek permanent residence through the skilled migration program.

However the skilled migration program is the largest and most direct category relating to ongoing provision of employment skills. Subject to various minimum standards in matters such as health, this program selects entrants based on employer or state/territory government nomination or through points-based independent entry. Both pathways have strong skill requirements in the selection process.

Most temporary entry is uncapped, except for working holiday-makers. But caps do apply for permanent entry and, for 2014–15, the planned levels were: 190,000 for the total migration program (including 128,500 for skilled migrants and 60,885 for family reunion) and 13,750 for humanitarian entry.

Temporary entrants leave Australia (unless they stay illegally) and continuing residents also leave the country for short or long periods or permanently. This means net overseas migration is a better measure of the net sourcing of persons as additions to the Australian population and hence of the net skills provision effects. Net overseas migration fluctuates significantly including because departures are not subject to immigration permissions to the same degree as entry, under international law acceded to by Australia.

For arrivals, almost half of recent permanent immigrants and temporary residents held a

bachelor's degree or higher qualification prior to arrival in Australia, well in advance of the qualification levels for Australian-born (Figure 4.10).

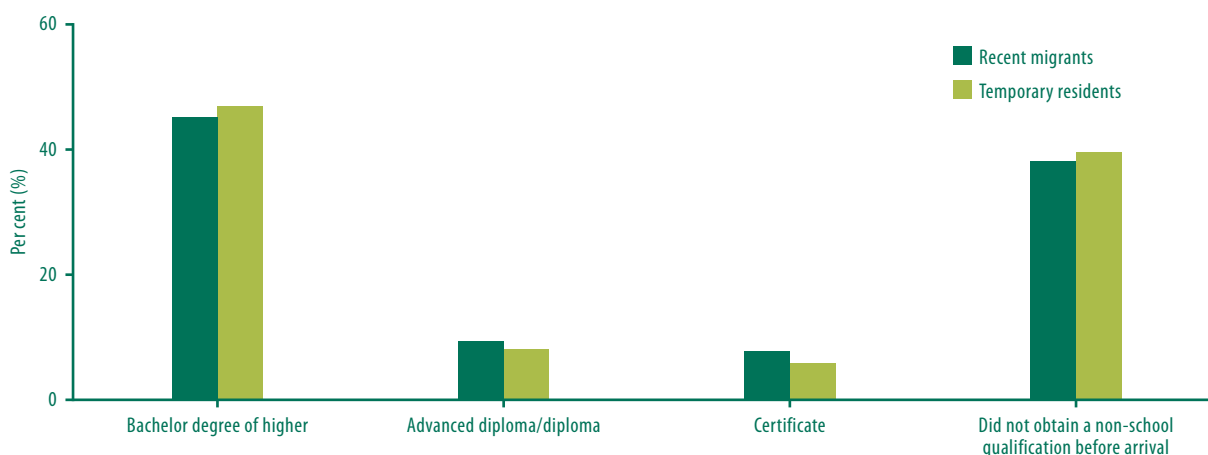
Given the magnitude and character of the migrant contribution to skills, it is clearly pertinent to ensure this is optimal. This effect of course embraces a wide range of issues: social, cultural, and environmental as well as economic; and these are visited elsewhere in this ACA Report including the following sections 4.3 and 4.4. However the economic impacts themselves are also significant.

A recent modelling study for the Migration Council of Australia (2015), using comparable modelling to this project's own work in section 5.1, has illustrated the extent of the economic contribution. According to its analysis and comparing zero net migration to present migration settings continued, by 2050 the positive migration scenario will have led to:

- a 5.9% gain in GDP per capita
- a 15.7% increase in the work-force participation rate
- a 604% increase in the population with a university education.

The specifics of this simulation may no doubt be challenged. And other methodologies to test such propositions can be pursued. Thus for this study the concern that immigration may produce higher unemployment in particular was examined closely using direct estimation methods (Elnasri 2015). Were migration a contributor to net unemployment, this would be

**Figure 4.10: Migrant highest qualifications, arrivals 2003–13**



Source: Productivity Commission 2015.

not only an economic concern but have major social and political implications. However a common finding of earlier studies has been that migrants create at least as many jobs as they fill. This finding was confirmed with the most recent data as available for this project.

The point here is that the possible contributions of migration to the workforce should be looked at alongside those of domestic workforce matters and that policy here should be subject to thorough review with an eye to maximising the comparative advantage to Australia from its migration experience. Such review has been lacking for some time, as seen in Chapter 2 above, but it is helpful that the Productivity Commission is to report on the Migrant Intake into Australia by mid-March 2016. Provided policy then further looks to non-economic as well as economic issues in considering change, this will be a helpful contribution to policy deliberation and perhaps revision.

Certainly the Productivity Commission Issues paper and other discussion does suggest that improvement is possible in migration program arrangements, even though Australia is still seen as somewhat of a global model in this area, at least as regards how it manages migration processes (OECD 2014b). The correct migration level is a matter more open to contestation, partly because of the hard task of balancing of economic and non-economic factors. Nevertheless Australia does have comparative advantage strengths in this area and these can be subject to ongoing refinement. The important point is to recognise that migration policy can be seen as comparative advantage.

## 4.2.2 Providing infrastructure and financing innovation

### Providing infrastructure

In the later nineteenth century, when Australia actually had the world's highest living standards, economic historians made clear how much that depended upon our huge investment in building the nation's rail, road, telegraph, ports and harbours and building them well in terms of value for money (Butlin 1964).

Australia deployed the wealth from its natural bounty to support those resource-based industries with the infrastructure they needed. But it also and even more built cities for commerce and manufacture that made Australia one of the most urban of nations very early, despite a national image of a robust rural heritage (Ville & Withers 2014). The wealth of the nation was as much based upon a smart urban society, well managed and well administered, with good investment in infrastructure and skills and innovation, as it was simple exploitation of nature. Magee (2000) has shown that in the nineteenth century Australia led the world in patents per capita—just as it did in schooling participation and funding per student.

In the present day context, a look at the overall global rankings by IMD Switzerland, shows for Australia:

**Table 4.5: Australia's global rankings (out of 60 countries)**

	2010	2012	2014
Overall ranking	5	15	17
Infrastructure	18	19	18

Source: IMD World Competitiveness Yearbook 2014.

The good news is a steady result in recent years for infrastructure at a time when the overall Australia's ranking has dropped. The bad news is that the infrastructure ranking is middling. For back to the future to be a realistic goal, there is a need for some infrastructure enhancement even if it is steady and reasonably strong.

Infrastructure is a multi-dimensional concept, encapsulating energy, water, transport (rails, seaports, roads, and airports), information and telecommunications. The nature of each of these has changed but also there is continuity and evolution. Digitalisation has emerged as the dynamic successor to the telegraph, just as airports came to mean as much or more than harbours, but road and rail transport, electricity, gas and water remain in their modern guise as core economic infrastructure. And soft infrastructure in the form of schools,

hospitals, universities and prisons are also there, complemented by new technologies too.

Infrastructure also delivers substantial economic benefits. In Australia, a large part of the infrastructure is still publicly owned, with governments estimated to own a stock of economic infrastructure assets valued at \$614 billion and social infrastructure of \$263 billion. Equivalent private infrastructure in the same areas has been estimated at \$260 billion—a total of \$1137 billion in 2012 dollars. (Productivity Commission 2014).

Modelling done by Infrastructure Australia for its 2015 audit showed that in 2011, \$187 billion worth of benefits (in Direct Economic Contribution) was derived from infrastructure. *Prima facie* this would represent a return of over 10% (Infrastructure Australia 2015). Public and private investment in this infrastructure regularly represents between 3.5 and 6.0% of GDP (Figure 4.11).

So investment in infrastructure is very important indeed, as these magnitudes reflect, and for what they represent as an underlying physical structure of essential service provision for the nation.

### Future scenarios and potential

The 2015 *Australian Infrastructure Audit* showed that in the primarily urban country that Australia is, cities contributed over \$850 billion to the economy in 2011, and this is projected to increase by 90%, to \$1.6 trillion by 2031. The value-added contribution of infrastructure is projected to double from \$187 billion in 2011

to \$377 billion in 2031. But, of course, this is not certain and unconditional.

If, in a strategic sense, the relative current performance of Australian infrastructure is judged as middling, potential solutions to it must deal with the added complication, i.e. how the demands on this infrastructure will change due to evolving social, economic and technological trends.

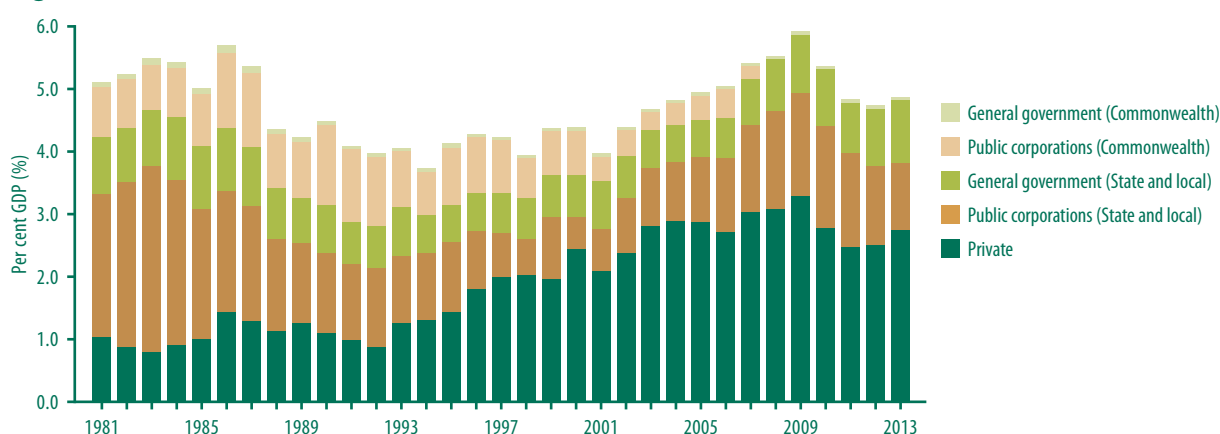
The first major trends, evident from earlier scenario analysis, are those of rising population and increasing urbanisation. The population is projected to increase to around 30.5 million by 2031. Given a 2011 census population of 21.5 million, this would represent a more than 40% increase in less than 20 years. The four major, extended metropolitan areas of Sydney, Melbourne, Perth and Brisbane will alone account for two-thirds of Australia's population by 2031.

Unless proactively planned for, this increase could cause significant congestion and cost Australians nearly \$53 billion (Infrastructure Australia 2015). But the costs are more than just economic. Growing congestion could also adversely affect the world-ranked quality of city life.

A growing population will not just pressure transport infrastructure, but also that of energy and water. A projected economic growth of total 84% (from \$1.4 trillion to \$2.6 trillion) over this period is also heavily dependent on appropriate infrastructure investments.

In the matter of future scenarios it is clear that both population futures and economic futures

Figure 4.11. Investment in economic infrastructure, Australia



Source: Productivity Commission 2014.

stress the requirements for infrastructure provision to underpin an expanding population as well as support enhanced productivity for meeting economic, social and environmental objectives.

In terms of understanding of policy needs in this area, the compendium of reports in Chapter 2 found this to be an under-reviewed area.

Fortunately, the Productivity Commission did report in May 2014 on public infrastructure. The Commission was very clear on the potential for improved efficiency in this area. It found that 'a key message of this report is that there is a fundamental need for a comprehensive overhaul of the poor processes currently used in the development and assessment of infrastructure particularly, but not exclusively, by governments'. It is disappointing however that these factors were also listed in the 1995 *Private Infrastructure Task Force Report* (EPAC 1995).

The 2015 infrastructure audit also provided an overlapping a list of reforms that it says were both important and urgent for Australia's long term prosperity and wellbeing.

The Commission especially pointed to deficiencies in the following:

- project scoping and transparent cost-benefit analysis
- long-term planning, demand forecasting and risk analysis
- greater use of user pay rather than taxpayer funding mechanisms
- efficient allocation of risk across private and public partners.

The Infrastructure Australia 2015 audit report called for the following reforms:

- market reforms, including increasing competition and a focus on efficiency and environment

- institutional reforms to facilitate increased funding, including through public-private partnerships
- administrative reforms, including streamlining procurement, appraisal and assessment procedures across governments.

As is evident, the above findings are consistent with and complementary to each other.

Likewise work conducted for this ACA project also reported clear evidence of inefficient provision across different sectors and in different jurisdictions (Elnasri 2014).

Less clear-cut is policy guidance on the quantum of infrastructure investment needed. In principle this would emerge from comprehensive cost-benefit analysis of the kind proposed by the Commission, such that projects that provide a prospective social rate of return above the government funding hurdle rate should proceed. More work on what this principle would produce is needed and a body such as Infrastructure Australia should prioritise such analysis and look to its macro-economic and sectoral contributions.

A suitable contribution to future development from infrastructure may require both some enhancement of processes and better funding of the quantum of investment needed to provide the right foundations, so that this source of comparative advantage may contribute better to the sectors and society so served.

In the stakeholder surveys completed for this project, the assessment of whether basic infrastructure was adequate, efficient and well maintained is shown in Table 4.6.

Clearly there is some significant opinion from key stakeholders that infrastructure adequacy is less than could be hoped for. Public servants have a slightly more negative view than the business

**Table 4.6: Stakeholders' views on infrastructure adequacy (%)**

Stakeholder	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Public servants (IPAA)	8	28	15	42	7
Business (CEDA)	7	38	12	34	9

Source: Kumar 2013a; Kumar 2014.



community, but both are far from being strongly supportive. Advance does seem warranted from such opinion.

Moreover this is backed up by objective analysis. The statistical analysis conducted for this project (Elnasri 2015) has established a strong relationship between infrastructure investments and 'multifactor productivity', the value-add from factor inputs.

It does seem that we have some guidance to what to do, and knowledge of the pay-offs. It is further political implementation that awaits.

Infrastructure refers to physical structures commonly used in economic and social activity and operating in an interconnected form. The scale and interconnectedness have meant that public sector involvement in development, finance, ownership, and service provision has been common. Indeed the term public infrastructure is common, though many forms of private sector involvement have emerged ranging from contracted provision through to full privatisation of assets.

### Financing Innovation

Access to adequate finance is a major contributor to poor innovation outcomes in Australia. In fact, the *Business Characteristics Survey* of the Australian Bureau of Statistics as reported in Withers and Gupta (2013), identifies this as the biggest impediment to innovation in Australian firms, over 90% of which are classed as SMEs. Table 4.7 illustrates this imbalance.

These results are for all firms taken together, but become even more pronounced when separated by innovation status and firm size. For small firms that were actively engaged in innovation,

funding and cost constraints were a hindrance in 66% and 47% of these firms, respectively. By contrast, funding constraints were a problem for only 15%, and cost constraints were a problem for only 16% of large firms. Non-financial constraints were a relatively smaller problem for all types of firms. The same pattern is repeated for all firms taken together, regardless of their innovation status or size.

Funding constraints were much more acute for smaller firms than for larger ones, as seen in Table 4.8.

Despite funding constraints being a real problem for firms, several policy reports have contended that education and skills development are the biggest constraints on innovation, and called for greater investments in STEM-based education to alleviate these constraints. The point is though that finance remains important.

An analysis of the structure and delivery of government assistance for industry further shows a gap between evident problem and policy focus. This assistance can broadly be differentiated into financial and non-financial categories (summarised in Table 4.9). Policy instruments supporting businesses can be grouped into two further sets of categories: general versus targeted, and direct versus indirect.

Research relating to innovation constraints has highlighted several issues that help to understand why current assistance has not been able to fully redress problems in Australia's innovation standing. These are:

- The government assistance most easily accessible to SMEs is of a non-financial nature, even though their constraints are primarily financial.

**Table 4.7: Barriers to innovation in Australia**

Barriers to innovation	Response rate
Funding constraints	21%
Cost of development & implementation	15%
Lack of skilled personnel	13%
Government regulation and compliance	13%
Uncertain demand for new goods and services	13%
Access to knowledge or technology	3.6%

Source: Withers & Gupta 2013.

- In terms of financial assistance, competitive (financial) grants are always application-based and closely capped rather than demand driven, while tax concessions are demand driven but may require certain pre-requisites relating to type of industry, activity, or products. In any case, financial assistance helps only a small fraction of SMEs.
- Non-financial assistance is broadly available to small firms, but is of limited benefit when these firms lack the financial means to implement many of the recommendations gained through advice and support.
- Eligibility requirements for grants often treat innovation and R&D as synonymous, even though innovation is appropriately defined as being much broader in scope. This means that firms may lose out on opportunities to implement non-scientific innovations that are no less important.

SMEs face further problems, as their size effectively precludes them from funding sources more reliably available to their larger, more

established counterparts. For example, capital (equity or debt) markets are effectively ruled out due to their size. Nor do such firms have the legal, financial, or organisation capability to negotiate or execute such deals.

Two other sources of finance are venture capital and commercial banks. Venture capital is a useful but insufficient alternative because it typically has a higher investment threshold than most smaller firms can afford or support. Financing by commercial banks by contrast imposes up-front repayment obligations on borrowers. This may place significant pressure if projects have long gestations and/or uncertain prospects. Collateral requirements, which for smaller borrowers is often the family home, can also place an unacceptable level of burden and risk on potential borrowers.

The most fundamental problem here arises because potential borrowers are not able to indicate their 'quality' to banks. This problem of information asymmetry identified by Nobel laureate George Akerlof is a major cause for market collapse and lost opportunities.

**Table 4.8: Constraints and response rates**

Constraint	Response rate					
	Innovation-active firms			All firms		
	Small	Medium	Large	Small	Medium	Large
Funding constraints	66%	25%	15%	43%	20%	12.5%
Cost constraints	47%	22%	16%	32%	17%	14%
Access to knowledge or technology	14%	3.1%	4.5%	8%	2%	3%
Skills shortages (within the business)	41%	22%	14%	27%	18%	13%
Demand uncertainties	38%	17%	9%	26%	14%	9%

Note: Small-size firms have 0–19 employees, medium firms have 20–199, and large firms have over 200; values are rounded off to the nearest decimal.

Source: ABS 2012, *Innovation in Australian Business*, catalogue no. 81580D006\_201011.

**Table 4.9: Innovation aid available to SMEs, Australia 2014**

Financial assistance	Non-financial assistance
Grants	Advice and support
Tax concessions	Information
Credits	Mentoring
Subsidies	Facilitation and introductions

Source: Department of Industry 2014.

These results show a clear case for policy solutions that alleviate the financial constraints for firms and the basic information asymmetry that creates it. This would allow them to build a good credit profile and investment level while pursuing new innovations, without the onerous burdens that stymie innovations.

Even if, as may be the case (Enright & Petty 2013), the financing issue is one common to small business in most like economies, it may be that a distinctively Australian solution could be contemplated as part of creating comparative advantage. Specifically, one way forward would be to look at pursuing business innovation better using an Australian policy innovation to drive this, namely income contingent loans. As used for higher education, these might be extended for research and development (Withers & Gupta 2013).

## 4.3 Fostering a harmonious society

There is much discussion regarding the nature of social equity and social harmony. These are issues of enduring relevance. In Australia the stakeholder surveys conducted for this report indicate that social inclusion and culture are undoubtedly well regarded but with some significant reservations, especially by public officials.

This section considers these views. They have both intrinsic importance and they have links to the economic outcomes of the nation and vice versa. It is important either way to see how they can be sustained and enhanced so as to be national strengths.

### 4.3.1 Equitable growth: a mirage or an oasis?

The phenomenal success of Thomas Piketty's book, *Capital in the 21st Century*, illustrates how important this issue can become both in ideas and substance.

This section addresses the important issues of the impact of inequality on national prosperity, and whether there is a dichotomy between growth and social cohesion, both in Australia

and globally. An investigation by the Rand Corporation for this project on the link between growth and equity is the basis for documentation for this section.

The present focus is on income. Naturally other dimensions of equity are also important ranging from wealth versus income, to opportunity and access, and issues such as wealth, age, ethnicity, household status and more. This matters immensely as in areas of transmitted disadvantage or indigenous inequality issues. But income is currently at the centre of the debates raised by the Piketty study and so is chosen as the focus to illustrate equity issues here.

According to Piketty and other writers such as Maddison<sup>2</sup>, a big part of global rising inequality across the developed world is attributable to 'skill-biased technical change', which relates to the notion that the advent and generalisation of computers increased the productivity of highly skilled occupations compared to that of lower skilled ones. Under this hypothesis, the increase in wage inequality has been particularly noteworthy. An important reason for this is the rise—facilitated by the rise of ICT and globalisation—of production sharing, where routine, low-skilled tasks are outsourced to emerging economies, and abstract, skill-intensive tasks such as design and analysis are retained in developed countries.

Another related hypothesis that explains rising inequality is that of asymmetries in capital accumulation and the growing importance of non-wage compensation. Wealth accumulation rather than wage inequality is the primary explanation for overall increase in inequality. This is also a core premise of Thomas Piketty's book. The basic idea behind this is that technology-driven growth increases the relative demand for capital and therefore its rate of return. And since the higher-end of the socio-economic spectrum is more likely to control a greater share of capital, such growth is likely to confer

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2. The share of total income accounted for by the top 1% of the Australian population declined from the late 1940s till around 1980, after which this has steadily increased. According to highly regarded research cited in the Rand report, a big part of this rising inequality across the developed world is attributable to 'skill-biased technical change'.

a disproportionately higher benefits to these sections of society.

As Figure 4.12 shows, equity outcomes have been relatively stable for much of the 20th century despite rising growth, but there has been a consistent positive correlation between growth and inequality since the 1980s.

The share of total income accounted for by the top 1% of the Australian population declined from the late 1940s till around 1980, after which it increased steadily.

According to the Rand report, a particular risk for Australia can arise as the effects of the mining boom fade. The unprecedented 'rents' that accrued from the resources sectors, especially in states that levy a royalty on mineral resources, has helped the government to fund increased public expenditures and transfer payments. This

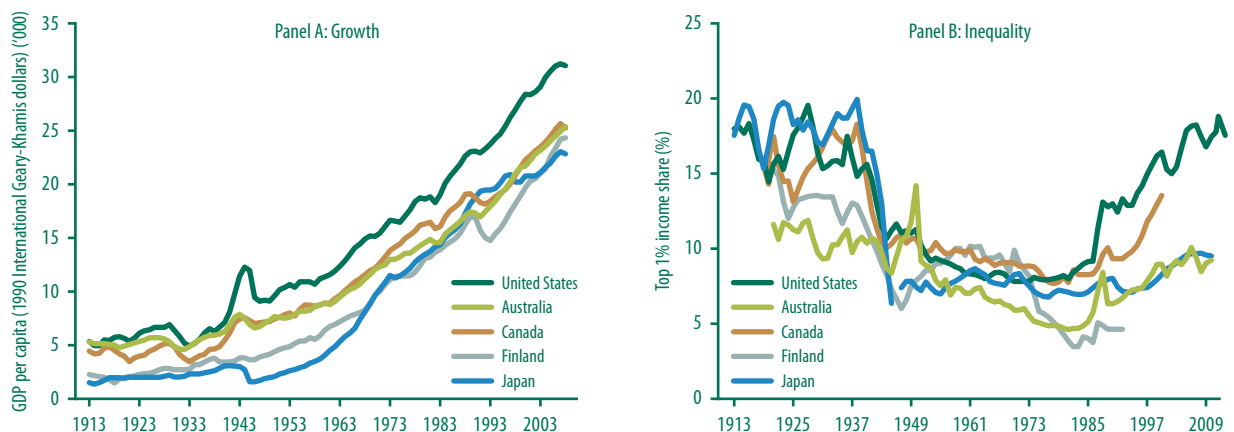
in turn has reduced inequality. However, the dissipation of the boom can put pressures on the public purse, and hamper government's ability to maintain the same level of public spending (Figure 4.13).

Given these patterns, one all-important question that naturally arises is, can inequality be alleviated without compromising growth? In fact, is it possible to achieve growth while at the same time alleviating inequality?

Australia has shown itself to be a highly efficient tax transfer nation and stands at a point where, according to the IMF (2015), it has not inhibited growth through these processes.

In addition to tax transfer mechanisms a further mechanism for ensuring that growth with equity is feasible, is increased and well directed investment in human capital. Indeed,

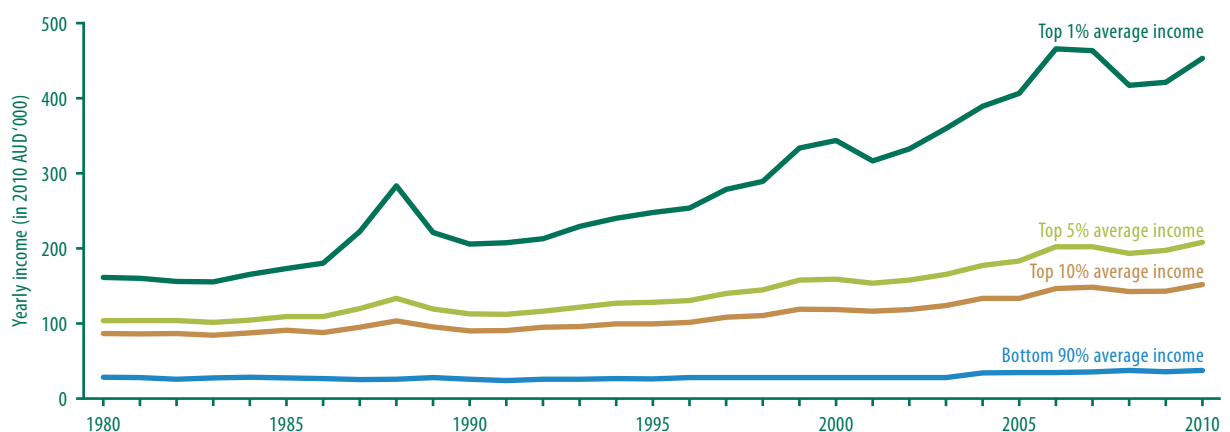
**Figure 4.12: Long-term growth and inequality in developed countries**



Source: Angus Maddison project <[www.ggd.net/maddison](http://www.ggd.net/maddison)>. Source: Rand Corporation 2015.

Source: World Top Income Database.

**Figure 4.13: Inequality in Australia since 1980**



Source: Rand Corporation 2015, individual incomes.

one major criticism of the Piketty work is that it looks principally at physical capital and does not examine human capital in the same way. Certainly investment in education has a high economic return in almost every country, and Australia is no exception.

In terms of the inequality implications of skills-driven growth, there are two primary mechanisms by which highly-skilled workers reduce inequality:

- the increased supply of highly skilled workers increases the ratio of the highly educated to the less educated, which then reduces wage inequality (through the university/high school mark-up)
- increasing levels of education are also associated with lower unemployment, which, *ceteris paribus*, reduces inequality. As shown in Figure 4.14, unemployment rates are progressively lower for those with below secondary education, secondary education, and tertiary degrees. Thus it creates further incentives for government to ensure increased participation, completion, and quality.

An emphasis on fostering investment in education and training and accumulation of skills seems therefore to be a core principle for building comparative advantage. It is a win-win contributor to growth with equity. Moreover, it is arguable, that the skills created and the research conducted with education are also

very conducive to enhanced sustainability, an objective considered separately below.

It is also a key to addressing the other issues of equity not covered here, such as indigenous disadvantage and inter-generational poverty. But these issues are also even more complex requiring deeper analysis too e.g. the Australian policy of 'closing the gap' for indigenous disadvantage and the sometime successes and ongoing failures too here.

### 4.3.2 Modern democracy: diversity and inclusion

The previous section positioned inequality as a significant challenge to national wellbeing. Another challenge that needs to be considered is that from rising impact of cultural diversity across much of the developed world, including Australia, and from what has been called at a grand level the 'clash of civilisations' (Huntington 1996).

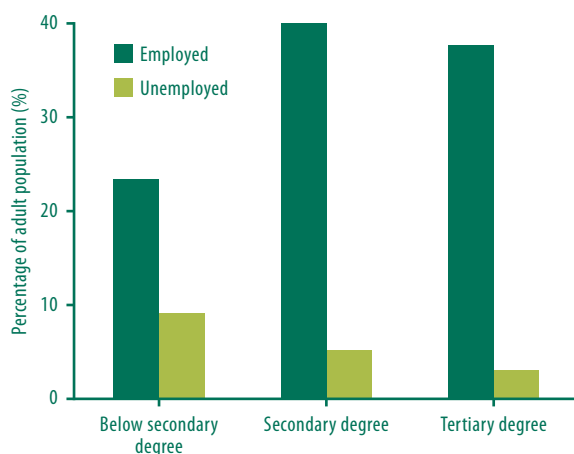
Australia's population in particular has undergone a rapid transformation in the past 60 years. In 1947, more than 90% of the Australian population was born in Australia, but this proportion had reduced to less than 73% by 2011. As shown in Table 4.10, a significant share of the change is accounted for by birthplaces in Asia and other non-English-speaking regions.

Management of this multi-cultural diversity is an issue of great strategic importance.

September 11, 2001, was a watershed moment in world consciousness. Suddenly the greatest existential threat to societies generally, but advanced democracies in particular, did not come from organised armies representing nation-states, but from terrorist 'sleepers', representing a small minority of radicalised youth with extremist and violent ideologies.

A decade on, advancements in mobile technologies and the rise of social media have made it easier than ever before for loosely-organised, highly decentralised terrorist groups to attract and recruit people from the local citizenry, many of whom are disenchanted and/or struggling to find a sense of identity and belonging in a fast-changing world.

**Figure 4.14: Employment and unemployment rates, by education categories, Australia, 2013**



Source: Rand Corporation 2015.

As economic progress in the 20th century did not preclude geopolitics and military conflicts, so will the economic imperatives of the 21st century need to be balanced with transnational conflicts. However, as shown by the rise of Al Qaeda and Islamic State, the nature of the conflict has decisively changed (Table 4.11).

It is important to emphasise that it is practically impossible to predict and stop all such attacks from happening. Countries have to instead blunt the attractiveness of extremist ideologies, and to prevent local youth (including those born and raised in Australia) from getting radicalised in the first place. The greatest battle to fight is for peoples' hearts and minds, and social media and inclusive policies are the main weapons of choice in this battle.

Hence there is an equal need to ensure that perceptions of 'racism' within Australia and in its policies are reduced since these can themselves pose equally serious threats to our comparative advantage as witnessed in the Indian Student reaction in 2008 to reports of attacks on such students in Melbourne.

This has to be a long-term effort, and one which success is hard to measure in a consistent way, nor is there a clear and widely shared definition of success. Short-term successes can often lead to adverse complications over a longer timeframe. But it is clear that being productive

and prosperous would be difficult in an environment characterised by pervasive fear of violence and persecution.

So far Australia has done well in terms of managing its social cohesion and cultural diversity. Except for a brief period in the 1990s, anti-minority and anti-immigrant parties have failed to gain traction in the political discourse. Quality of life is consistently ranked amongst the world's best. These are major national strengths that should be reinforced and emphasised. However, as seen in the early part of this report, this is also an area that has not always gotten appropriate policy attention.

The task of building comparative advantage from cultural diversity requires minimisation of cultural dysfunction. It is a hard task, given human history of dealing with difference, but if any nation can ensure this is indeed a strength it is Australia and hence a priority issue, somewhat neglected in policy commitment, at least in recent times.

Ways forward include appropriate recognition and representation of 'non-mainstream' communities on councils and boards of non-profits, governments and business. This is important not just for improved sense of community belonging, and reduced tension, but also for improved access to services, improved business networking, and for enhancing international research collaboration and public diplomacy in the region. The SAF

**Table 4.10: Population by region of birth (%), 1961–2011**

Year	Australia	UK, Ireland & NZ	Europe	Asia	Other
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

Source: Australian Bureau of Statistics.

**Table 4.11: Recent terror attacks globally**

Lindt Café Siege, Sydney	Parliament Attack, Ottawa
Charlie Hebdo Shooting, Paris	Boston Marathon Bombing, Boston

project on Asia literacy has well-developed conclusions on these issues and related discussion is also to be found above in this present report relation to the rise of Asia.

In the stakeholder surveys completed for this project, views on the strength of the contributions of social inclusion and Australian culture to national wellbeing were mixed (Table 4.12).

This supports the conclusion that more work is needed in these areas to ensure they do serve as national strengths.

### Insights and conclusions

- Economic equity and social cohesion are important for long-term prosperity and wellbeing.
- Tax transfer policies and investment in high-skills education is a core mechanism for alleviating long term inequality.
- Cultural cohesion and social inclusion for diverse communities are important in order to foster ongoing social harmony.

## 4.4 Ensuring sustainability

As Australia seeks to uncover new areas of growth, compatibility with environmental sustainability must also be considered. Environmental performance and sustainability are issues of great importance to the nation, and they centre on the legacy that the current generation will leave for posterity. The ability to achieve high levels of prosperity while also maintaining environmental sustainability is considered therefore as a critical criteria for pursuit of the nation's comparative advantage.

A key issue in environmental sustainability, particularly for an urban country like Australia, arises from the impact of rising population and urbanisation on environmental outcomes. This and other issues are also likely to be covered in a detailed ACOLA report on sustainable urban mobility that had commenced shortly before the finalisation of this report.

This section evaluates Australia's environmental performance over the past two decades, which coincide with a period of uninterrupted growth and unprecedented prosperity. As such, it can provide invaluable lessons for the future. The role of population and economic growth on the environment—and the extent to which negative effects can be mitigated through technological change and policy intervention—is important in light of Australia's expected growth patterns.

At its core, the debate revolves around whether continued economic development irretrievably and inevitably degrades the environment to an unacceptable level due to a fixed set of constraints, or if technological progress and demand-side pressures through public policy can help to mitigate or even alleviate environmental damage, leading to so-called 'sustainable development'.

According to the research conducted for this project by Rand Corporation, the overall environmental response to GDP growth is determined by a balance between the scale effect on one hand, and a combination of technology and composition effects on the other.

As an economy grows, the 'scale effects' of rising income drives up demand for natural resources, and with it the pollution associated with economic activity.

**Table 4.12: Stakeholder views on social inclusion and culture (%)**

'Social inclusion operates well'	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Public servants (IPAA)	8	34	29	27	2
Business (CEDA)	3	36	27	28	6
'Australian culture contributes strongly'	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Public servants (IPAA)	3	12	23	48	14
Business (CEDA)	9	51	27	11	2

Source: ACA's *Stakeholders Surveys Reports* for IPAA and CEDA 2014.



'Technology effects' imply a shift towards better technologies as growth increases, often in response to public demands for better environmental and/health outcomes.

'Composition effects' reflects a nation's economic profile; as an economy grows, it transitions towards more service-oriented sectors, which by definition have a smaller environmental footprint.

The scale effect implies that emissions (or other relevant environmental activity) will increase in response to increased growth and therefore have an adverse environmental impact. The technology and composition effects are expected to mitigate these by improving environmental outcomes in response to GDP growth. Finally, where technology effects do not occur or compositional transitions are slow, deliberate and properly designed policy intervention can also have a positive impact.

A theoretical construct called the 'Environmental Kuznets Curve' (EKC) explains this as a dynamic process. According to this theory, as an economy initially develops, the scale effect dominates, but subsequent growth causes the technology and composition effects to dominate. Therefore, environmental sustainability first deteriorates with increased growth, but eventually starts improving.

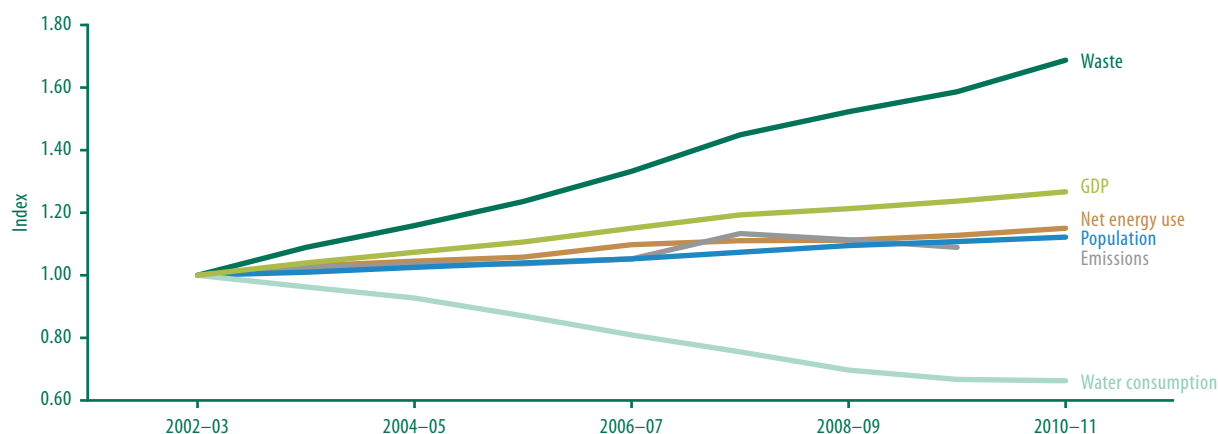
Figure 4.15 illustrates these competing effects. It compares GDP to a range of aggregate

environmental indicators, including overall greenhouse gasses (GFG, shown as emissions), population, water use, net energy use, and waste. All variables except for water consumption have increased in the decade from 2002 till 2011. Waste is the only environmental variable that has increased more than GDP, and it is one closely linked to population increase.

The upward trajectory of most of the environmental variables shows that the scale effects of growth are dominating, though this is mitigated by the technological and composition effects (since intensity per unit of GDP is rising, but still lower than GDP). Therefore, it can be said that the harmful environmental effects of growth are partially, not completely mitigated.

This result has important policy implications. The composition effect is likely to continue in the short to medium run, but its effect will be limited in the long run by a natural cap on the proportion of the economy dedicated to services. Therefore, mitigation of the scale effects will have to come through public perceptions and technology changes. The heavy reliance of the economy on the mining sector (as shown in the previous chapter) and on carbon-based fuels means that such transition would need to be incentivised by effective policy action.

**Figure 4.15: GDP, population and selected physical indicators of environmental pressure, 2002–03 to 2010–11 (Index)**



Note: Index: 2002–03 = 1.

Data sources: ABS; Department of Climate Change and Energy Efficiency; Department of Sustainability, Environment, Water, Population and Communities.

Source: Rand Corporation 2015.

Overall, the analysis for this report focused on three components of environmental performance:

- Greenhouse gas emissions
- Resource use (including biodiversity)
- Ecosystem vitality

It found limited support for the EKC hypothesis, both globally and within Australia. Moreover, analysis of each component part was influenced by its unique characteristic. These are briefly reviewed here below.

#### 4.4.1 Greenhouse gas (GHG) emissions

Two main categories of GHG are carbon dioxide (CO<sub>2</sub>), which is associated with global warming, and Criteria Air Pollutants, which are indicators of air quality and impact upon human health.

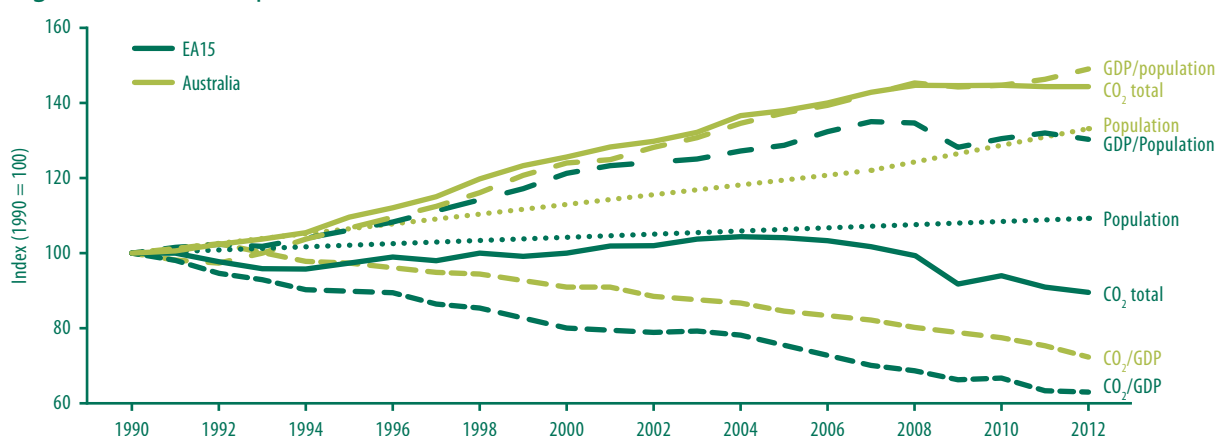
Figure 4.16 compares results for CO<sub>2</sub> for Australia and a group of 15 Eurozone countries. It shows an overall negative performance with regards to carbon dioxide. Total carbon emissions fell more than 10% in a group of 15 Eurozone countries between 1990 and 2010, while they actually increased by more than 40% in Australia. This increase is accounted for both by increases in per capita GDP and population, though the former has a greater proportional impact. Some of the growth in emissions has been offset by reduced carbon intensity (CO<sub>2</sub>/GDP), which captures technological efficiency and a change in the energy mix.

It is also noted that within Australia, total emissions stayed stable from 2008 onwards, and even declined slightly in 2013 and 2014. The steady or declining emissions trends are broadly consistent with the timing of the carbon pricing regime that was introduced as part of the Clean Energy Future initiative, and appear to show that a decoupling of CO<sub>2</sub> emissions and economic growth may be possible in the short run. However, this is only an observed correlation and a more systematic analysis would be needed to establish a definitive causation.

With regards to air pollutants, these are generally by-products of fossil fuel combustion, motor vehicle emissions, and other industrial processes. The Rand analysis used five different measures for air pollution. Of these total emissions for carbon monoxide (CO) and volatile organic compounds (VOC) decreased, but those for sulphur oxides (SOX) and nitrogen oxides (NOX) have increased. The fifth of these, particular matter of a particular type, has shown a marked increase since 2009, largely driven by higher emissions intensity.

The reductions in CO and VOC may be attributable to national implementation of vehicle emissions and fuel quality standards for new vehicles. This notwithstanding, a comparative performance against OECD results again shows that Australian performance falls below global standards. In each of the first four pollutants, Australian income growth (scale effects) had a higher impact on emissions than in OECD.

Figure 4.16: Decomposition of Australian and OECD carbon dioxide emissions, 1990–2012



Australian data sources: Australian Greenhouse Emissions Information System (ADE 2014); Australian Bureau of Statistics (ABS 2014).

OECD data sources: StatExtracts, Organisation for Economic Cooperation and Development (OECD 2014).

Source: Rand Corporation 2015.

Emission intensity (attributable to technology) has a lower mitigating effect in Australia than in the OECD for both sulphur and nitrogen oxides (both of which have increased in Australia).

#### 4.4.2 Resource use

Efficient use of resources, both in terms of water and biodiversity, are very important for Australia. With the exception of Antarctica, Australia is the driest continent on earth, and the use of freshwater resources is important for maintaining its comparative advantage, particularly in agriculture. Irrigated agriculture accounts for between 50–65% of Australia's water consumption, and just under 30% of the overall value of Australian agriculture. Of the total irrigation-based water use, approximately half is used in the Murray-Darling Basin (MDB) in the southeast.

A decomposition of the water use for irrigated agriculture in Australia showed that overall Australian agriculture has become more efficient in its water use, with both greater output values per acre of irrigated land and less water intensity per dollar of production (Figure 4.17). This reinforces the results of the analysis of Australian agriculture done by ACIL Allen Consulting (in Chapter 3).

As with irrigated water, the performance of urban water over the past two years has also been encouraging. The past two decades have led to both technological and policy responses

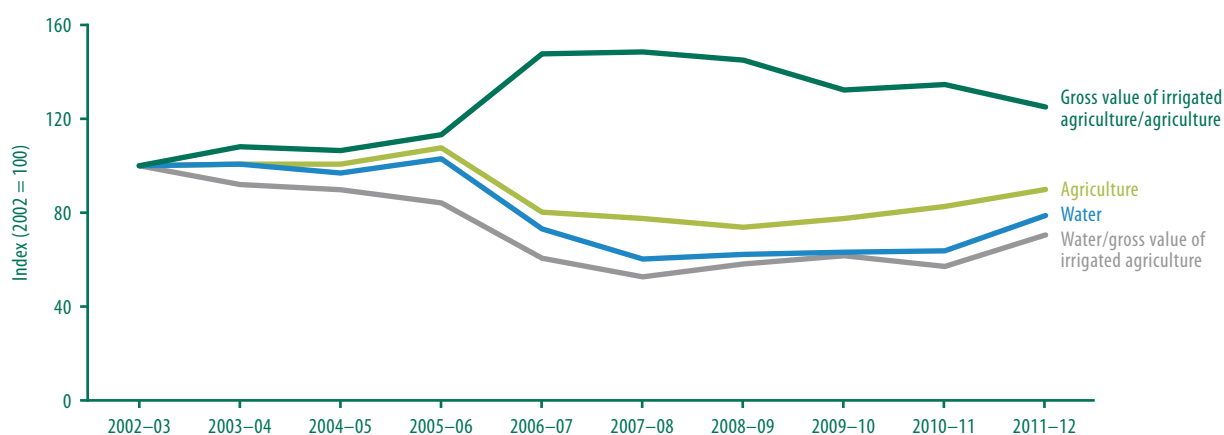
with respect to urban water. The Australian drought from the late 1990s till 2010 spurred a considerable amount of investment in developing substitutes for surface water via desalination plants. In particular, ongoing or completed projects in Adelaide, Melbourne, and Perth could, at full capacity, supply between 40–50% of urban water needs in each of these cities.

Overall, therefore, these results show that water resources have been managed well in Australia. This is due to technological and efficiency improvements, both directly and also indirectly through government policies. The lessons of this can be studied and applied to other areas as well.

The Australian biodiversity is an irreplaceable resource and part of the national heritage. As shown in Figure 4.18, since 1990 the percentage of protected areas, both terrestrial and marine, has increased substantially. This followed the 1992 signing of the Rio Earth Summit, when Australia ratified and signed the Convention on Biological Diversity, and established a national strategy for biodiversity conservation and system of protected areas. Spending of protected areas further increased substantially after 1998.

The positive assessment notwithstanding, the evidence on actual outcomes with respect to biodiversity protection are inconclusive and highly contested. This is partly because data quality is inconsistent and incomplete, and measurable metrics are difficult to measure and construct. According to evidence cited in the Rand report,

Figure 4.17: Decomposition of water use in agriculture



Data sources: Australian Bureau of Statistics, *Water Use on Australian Farms* (cat. no. 4618) and *Gross Value of Irrigated Agricultural Production* (cat. no. 4610), various years.

Source: Rand Corporation 2015.

while protected areas have increased, subject matter experts tend to take a generally pessimistic view of both the state and trend of these genetic resources, the degradation of which may be irreversible. Severe data gaps remain which pre-empt our ability to measure the biodiversity dimensions of the status quo, and thus the overall trend in the stock of natural capital.

#### 4.4.3 Ecosystem health

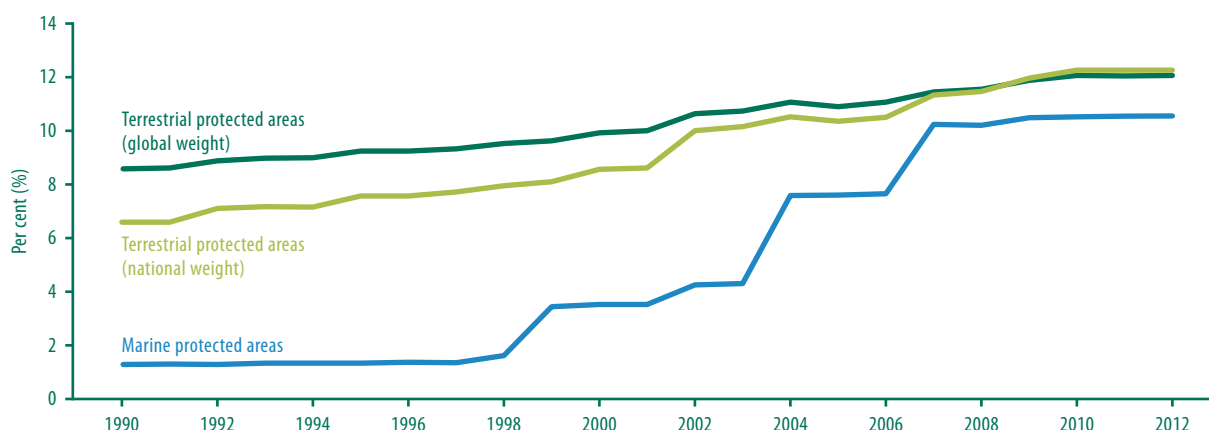
While the previous discussion has focused on individual air or water quality indicators, this section considers the aggregate indicators of ecosystem health or non-emissions measures of environmental quality.

Figure 4.19 presents overall Environmental Performance Index (EPI) and major subcategory

indices (environmental public health and ecosystem vitality) for Australia for the period 2002–12. The overall EPI score increased by 2.3% over this period, but the ecosystem vitality score showed a marked improvement.

The Rand results show that Australia's overall environmental performance has increased in the decade since 2002. However, this constitutes an incomplete and imperfect picture of the overall state of the environment across Australia. These results must also be qualified in context of the earlier benchmarking analysis, which showed that Australia ranked low in particular environmental measures on global indices. Therefore, even though Australia's individual performance has increased, it is still well below global standards.

**Figure 4.18: Trends in protected areas, Australia, 1990–2012**

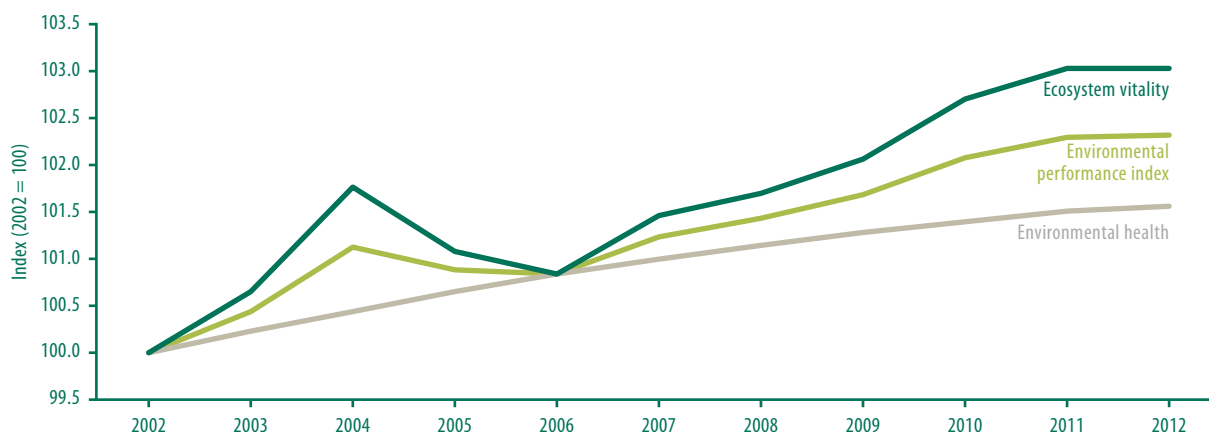


Note: Terrestrial protected areas are measured as a proportion of the abundance of all terrestrial areas in Australia (national weight) or globally (global weight). Marine protected areas are measured as a proportion of Australia's exclusive economic zone.

Data source: Environmental Performance Index 2015.

Source: Rand Corporation 2015.

**Figure 4.19: Overall environmental performance index and sub-indices, Australia, 2002–12**



Source: Rand Corporation 2015.

### 4.4.4 Conclusion

From a long-term strategic perspective, these environmental performance results raise important issues for Australia. The ACA project does not purport to solve the problems or give all answers, but merely to affirm and inform the issues here. It takes the view that without a proper consideration of these questions, Australia's ability to secure its long-term future will be compromised.

An overview of the standing of environmental and growth linkage for Australia at present is indicated in Table 4.13. This shows those environmental indicators that have deteriorated with growth, been unrelated to growth or have improved with growth. The term 'decoupling' is often used to indicate such linkage to economic growth where:

- 'absolute decoupling' means a declining environmental impact as growth proceeds
- 'weak decoupling' means a diminishing environmental intensity as growth proceeds.

It is in this area of environmental performance that the stakeholders surveyed for this project are particularly pessimistic. When asked to agree or disagree with the statement that ecological sustainability is being adequately addressed, their answers were as tallied in Table 4.14.

Table 4.13: Summary of environmental impacts of growth in Australia

Environmental impacts of growth
Environmental improvement <ul style="list-style-type: none"><li>• Carbon monoxide (CO)</li><li>• Volatile organic compounds (VOC)</li><li>• Applied nutrients (water pollution)</li></ul>
Mixed Outcomes <ul style="list-style-type: none"><li>• Carbon dioxide (CO<sub>2</sub>)</li><li>• Particulate matter 2.5 (PM2.5)</li><li>• Water used in agriculture</li></ul>
Environmental deterioration <ul style="list-style-type: none"><li>• Particulate matter 10 (PM10)</li><li>• Waste</li><li>• Nitrogen oxides (NOX)</li><li>• Sulphur oxides (SOX)</li></ul>
Inconclusive impact <ul style="list-style-type: none"><li>• Protected areas/biodiversity</li></ul>

Source: Adapted from Rand Corporation 2015.

Business response was somewhat more optimistic than for public servants, but in both cases many more disagreed than agreed that there was adequacy in address of these matters. Plainly, attention to environmental performance remains a perceived weakness in securing Australia's future.

Table 4.14: Stakeholder views on adequate address of ecological sustainability (%)

Stakeholder	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Public servants (IPAA)	2	16	20	42	20
Business (CEDA)	3	28	22	33	14

Source: Kumar 2014.

## 4.5 Conclusion

This chapter articulates the core strategic imperatives for Australia as it positions itself for the challenges of the 21st century. Identification of these imperatives is based on a multi-dimensional body of evidence compiled as part of this project. Consistent with the definition of comparative advantage articulated at the start of this report, the policy areas identified in this chapter seek to underpin pursuit of opportunities and a level playing field for all and any sectors of the economy. This report takes the view it is helpful to this first of most foundational national characteristics for comparative advantage.

As was argued in the previous chapter, even the sectors that have been traditional sources of strength and prosperity are facing constraints that transcend narrow disciplinary or sectoral boundaries. High growth potential will not be fully realised until these core problems are addressed.

## 4.6 Findings

Ten particular areas of importance have been identified in this chapter:

- The first deals with institutions, which set the rules of engagement and affect the incentives facing society and economy. Institutions are of many kinds, though the ones looked at in this chapter govern how powers and responsibilities are shared between the various levels of government (federalism), how knowledge creation is regulated and rewarded (intellectual property), how businesses compete in a modern capitalist society (competition policy) and how culture underpins understandings in society (cultural policy). While each of these have been real sources of strength in the past, they are at times failing to adapt to a changing strategic environment, and must be realigned to 21st century imperatives if they are to keep serving the national interest best.
- Amidst a spreading rhetoric of increasing innovation inadequate attention appears to be paid to national capacity for utilisation of that innovation. As things currently stand, this capacity is too limited. The shared understanding of innovation appears to be one focused on increased R&D. However, if Australia is to remain a competitive and prosperous nation in the 21st century, it must adopt a broad definition of innovation, one which encompasses both non-scientific innovations, as well as commercialisation of new research.
- A nation is defined by its people, and a nation's productive capacity is defined in the skills capability of its people. Australia has a work force whose skills capability is substantially respected. In order to remain so, it must be able to operate and add value in an environment characterised by high levels of global integration of trade and fragmentation of production. The rise of Asia and the economic power of its middle class create new challenges and opportunities. These challenges and opportunities require a multi-dimensional skills capability, where a strong STEM capability is complemented by capability in both management and humanities and social sciences. Immigration, the driver of major skills acquisition in the past, must be tapped as a mechanism for filling skills gaps over the short term, but even more for future development as well. However, immigration reform appears as a key priority for the future too.
- Industries are part of a bigger socio-cultural and environmental ecosystem. While both must be made resilient to changing circumstances, our collective national response to these circumstances should also avoid causing irreversible damage to the society and environment. Our quality of life and environment are great legacies we have inherited from past generations, and should take care that our collective stewardship of these delivers similar benefits for those who come after us.

- A cohesive and peaceful society—based on the principles of fairness, freedom, and opportunities for advancement—is the very basis of a functioning and productive society. It is self-evident that a society with endemic inequality or the fear of violence and persecution is unlikely to foster creativity, productivity, or dynamism. Australia has long enjoyed one of the higher standards of life in the world, and this has been based on social cohesion, rule of law, and a culture of ‘fair go’. The social contract that underlies Australia’s social strength faces two important emerging challenges. The first arises from an incidence of growing inequality around the world, which has caused much political and cultural impact around the world. Australia has done well in addressing this metric, but it has experienced increasing inequality over the last two decades. Secondly, the security challenges arising after the 9/11 attacks have greatly threatened and undermined the core tenets of liberal democracies, i.e. privacy and disagreement. Both of these need to be monitored and proactively addressed.
- Empirical analysis done for this report has shown a pattern of deterioration in several key environmental variables, which is only partially offset by adoption of better technologies, government policies, and transition to service industries. More work needs to be done to address the environmental impacts of growth. Water management is an area of particularly strong and positive performance, and could offer valuable insights and policy lessons that could be emulated across other indicators as well.
- Effective action across all these ‘bedrock’ areas would require effective and visionary leadership that articulates a vision based on a rigorous contestation of ideas, achieves public support by communicating the potential benefits of these to the public, and takes adequate account of public feedback and priorities.
- Comprehensive microeconomic reforms of the 1980s have been credited with delivering lasting income and employment growth for Australia. However, previous reforms were incomplete, and changing circumstances and imperatives create new opportunities for growth through additional reforms, particularly in the areas of global trading agreements, competition policies, workplace relations, and taxation. Empirical modelling done for the ACA project show substantial growth benefits of such reforms.
- Immigration has been a major source of skills enhancement for Australia and, with around 25% of its current population being overseas-born, is also a defining feature of Australian development. Australia is widely viewed as more successful than most countries in how it has operated its migration entry and settlement arrangements. As such, well-managed immigration should be an ongoing source of comparative advantage for the nation, and should be reviewed in order to ensure continuing optimal performance.
- Historical investments in infrastructure made Australia one of the most urban countries, and delivered one of the highest living standards in the world. However, as things currently stand, Australia ranks as a ‘middle performer’ amongst a cohort of advanced nations. Given a projected 40% increase in population over the next 20 years, a failure to upgrade and invest in new infrastructure could seriously undermine long-term national comparative advantage.



# 5

## Policy directions and options

### Introduction

The report on ACA has focused on a large body of evidence collected for this project, and has identified fundamental priorities for Australia's long-term wellbeing.

This chapter focuses on what it really means in a practical sense.

None of the ideas and priorities articulated in this report can come to pass without bold and far-sighted political leadership.

But leadership also involves:

- developing strong policies that are based on rigorous evidence and stakeholder perspectives, and ensuring mechanisms that can actually deliver results
- having a 'finger on the pulse' to know what the public will accept (or not), and where governments should seek to influence opinion
- demonstrating the potential benefits of the proposed changes, for without these getting public acceptance would be difficult
- working with others to obtain cooperation and understanding in managing change.



This chapter considers all four elements. Specifically, it looks at the importance of world-respected think tanks as forums from bringing together and synthesising expert knowledge on complex issues and problems. It also reviews the performance of public-private partnerships generally, which Australia pioneered, as a means for implementing policy solutions.

Australia is found to be quite weak in the area of rigorous contestation of policy ideas, which creates a risk that policies and paradigms can be 'imported' from overseas without a due consideration of their need or appropriateness in the Australian context. It can also mean that policies can be formed without a clear articulation of the fundamental problem itself. This needs redress.

Partnerships though have been a real strength for Australia, and this yields important lessons for many problem areas such as environmental sustainability, rising inequality, and multi-dimensional skills development.

The chapter also reviews research done for the ACA project that shows public attitudes towards various reform and spending proposals. The public will approve of many of the changes. Where it does not, there is scope for political leadership since on these matters there is a latent aspiration for good policy and acceptance of the need for change.

Finally, detailed econometric modelling conducted for this project (see Box 5.1) has shown that many policy ideas developed in this report can actually yield long-term economic

benefit for the country (next three decades or so). Moreover, many of the traditional reforms have focused on increasing competition. These can be further enhanced, but their benefits are insufficient and tapering off. What is needed now are more fundamental institutional reforms that build long-term capability. These investment-boosting reforms can yield far greater results over longer periods. But ideally the two types of reforms should be implemented together for the greatest benefit and the demonstration of their benefit can be part of the leadership dialogue that is needed.

## 5.1 Pay-offs for institutional reforms and investment in the future

Change is difficult for government but change becomes easier to implement if the benefits can be shown not only for the Australian economy but also for the prospects and living standards of its people. And change that strengthens Australia's comparative advantage doesn't have to be limited to narrow, sectoral improvements for areas deemed to be of economic importance. Modelling undertaken for the Australia's Comparative Advantage project by Independent Economics shows that broad policy change and reform have benefits across the economy over the next decades (Box 5.1).

### 5.1.1 Institutional reforms

A first scenario is adopted in the modelling analysis conducted for the project, which anticipates the broad, institutional policy change aimed at improving political, legal and market settings discussed in Chapter 4.

The specific policies that could be modelled reasonably here were:

- implementing the Henry Tax Review recommendation to cut the company tax rate from 30% to an internationally-competitive 25%
- implementing the Harper Competition Review policy of opening up industries such as pharmacy and taxis to competition
- the benefits of free trade agreements
- reform of federalism
- labour market flexibility, anticipating recommendations of the Productivity Commission Review of the *Fair Work Act* (easing but not abolishing the unfair dismissal laws and making the role of the Fair Work Commission less prescriptive).

All of these are subject to recent or current or prospective review and have associated guidance on their nature and possible effects. The modelling shows the economy and consumption would grow and there would be an improvement in employment rates and real after tax wages if these institutional changes were implemented rather than no change being made.

#### Box 5.1: Economic modelling approach

The scenarios are simulated using the Independent Macro-econometric model. It is the latest in a series of models developed since 1988 (Murphy, 1988; Powell and Murphy, 1997) and used for policy analysis and forecasting. The current model was constructed as a complete re-build to factor in recent developments in macro modelling and the Australian economy. Recent uses of the macro model include scenario analysis for the Parliamentary Budget Office (Independent Economics, 2014) and the Migration Council Australia (MCA, 2015).

While traditional macro-econometric models are more concerned with cyclical fluctuations in economic activity, this Independent model is focused on the longer term and provides an avenue for incorporating growth drivers. In 2014 the Independent macro-econometric model was further developed to incorporate semi-endogenous growth. This follows similar work with the Quest III model at the European Commission (Varga & Veld, 2011).

Some main relevant elements of this new part of the model structure include a demographic model, an education attainment model, occupation detail, a migration model, a treatment of the role of Government infrastructure in production, and a representation of the role of research and development in using highly-skilled labour to develop innovations that raise productivity.

Source: Independent Economics 2015.

The assumptions used in the modelling are conservative. They show improvements in both productivity and employment. Cutting company tax would encourage investment in capital stock. Reforms to federalism and competition policy would mean labour is used more effectively. Workplace reform would reduce the sustainable unemployment rate and lift productivity by allowing more flexible work practices and free trade agreements raise prices for agricultural exports with the income boost allowing a higher level of consumption for any given level of GDP.

For example the modelling shows it is possible that the productivity gains from implementing the Harper Review recommendations in full could add 2.5% to productivity and the changes to workplace laws could reduce the unemployment rate by 1%.

The gains from the Institutional Reform Scenario are largely realised by 2030 because the reforms focus on allocating resources more efficiently so once that efficient allocation has been achieved, the benefits persist but do not expand further (Table 5.1).

### 5.1.2 Boosting investment in capability

The second scenario modelled anticipates further Government investment.

This includes:

- a 10% sustained lift in general government sector spending on infrastructure

- reforms to encourage higher participation in the labour force by females and older workers
- comprehensive innovation policy reform using OECD best-practice strategies
- a lift in government funding of vocational education and training from 0.5% of GDP to 0.6% and an increase in university funding from 1.5% of GDP to 2.0%
- net annual overseas migration is held constant at 0.9% implying a rise to 400,000 by 2054–55.

In most of the measures modelling, the investment changes would mean a bigger difference over the baseline of no change than the competition changes.

The policies are growth oriented and unlike the Institutional Reform scenario, the benefits continue grow over time.

These policies also improve productivity and employment. Better infrastructure boosts business productivity while higher innovation activity makes an ongoing contribution to productivity growth. Lifting participation rates for females and older workers directly adds to employment as does additional investment in tertiary education. A higher migration rate also adds to employment per capita because a high proportion of migrants fall in the prime working age groups.

**Table 5.1: Institutional reform pay-off (% deviation from baseline)**

Pay-off outcome	2030	2050
Total population	0.0%	0.0%
University educated population	0.0%	0.0%
Employment	1.5%	1.1%
Consumption	11.3%	11.1%
GDP	8.6%	9.2%
Consumption per capita (living standards)	11.3%	11.1%
GDP per capita	8.6%	9.2%
Personal income tax (% point difference)	–4.9%	–4.2%
Real after tax wage	9.1%	9.9%

Source: Independent Economics 2015.

The modelling estimates lifting labour force participation could add 2% to the participation rate while innovation policy reform could add 0.25% to annual economic growth (Table 5.2).

Both scenarios on their own bring major economic benefits over the baseline of no change to current policy.

Under the scenarios modelled, both could potentially see annual consumption per head rise over the next 15 and 35 years however the investment only scenario shows greater benefits in the long-term out to 2050 than changes to institutional policy (Figure 5.1; Box 5.2).

### 5.1.3 Stronger together

Governments do not have to pick from one policy path or the other. It is not a choice between increasing investment or making changes that

improve institutions. The modelling underlines that by showing that the biggest economic benefits and benefits for Australia's comparative advantage come when both scenarios modelled are implemented.

Reforms across all ten areas specified to illustrate the consequences from policy change, chosen on the basis of widespread public discussion and review, provide bigger dividends than reforms in five areas alone (in either the institutional or investment scenarios). In both the outlook to 2030 and to 2050 the growth in annual consumption, and hence living standards, estimated in the modelling is considerably stronger under a combined scenario.

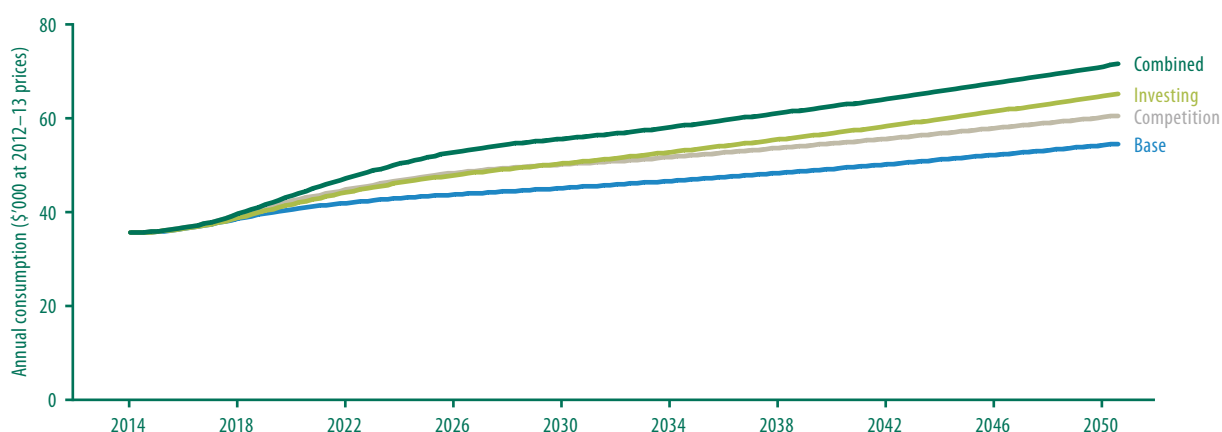
The size of the economy and consumption per head of population both are forecast to improve under the combined scenario with an effect on

**Table 5.2: Capability investment pay-off (% deviation from baseline)**

Pay-off outcome	2030	2050
Total population	1.8%	9.0%
University educated population	13.2%	33.8%
Employment	8.4%	19.2%
Consumption	12.1%	27.3%
GDP	10.0%	24.8%
Consumption per capita (living standards)	10.1%	16.9%
GDP per capita	8.1%	14.5%
Personal income tax (% point difference)	-7.3%	-13.7%
Real after tax wage	4.6%	12.8%

Source: Independent Economics 2015.

**Figure 5.1: Annual consumption per head (\$'000 at 2012–13 prices)**



Source: Independent Economics 2015.

## Box 5.2: Innovation

The modelling proposes a broad enhancement of innovation policy in order to lift Australia's performance to OECD best practice standards.

Australian investment in research and development is well below the OECD standard (OECD 2007). Countries with relatively high levels of research and development include Sweden, Japan, Switzerland, the US, Germany and Singapore. In those countries R&D investment ranges between 2 and 4 per cent of GDP where in Australia the investment is consistently under 1.5% of GDP.

In 2010 the OECD identified key elements of an innovation strategy. These include:

- excellence in higher education
- strong links between universities and industry
- international mobility and cooperation for researchers
- excellence in public research
- ease of market entry and exit for small firms
- access to finance by small and medium enterprises
- well-functioning venture capital markets
- more symmetric tax treatment of profits and losses
- R&D tax credits
- the availability of high speed broadband internet
- patent regimes that strike an appropriate balance between providing incentive and rewards to innovators and providing access to new knowledge for users.

If Australia can emulate such key factors to move closer to best practise by OECD standards, the modelling conducted for the ACA project indicates that major benefits ensue. How well Australia ranks by these criteria is an exercise that can better guide policy and is worth pursuit. Of course, due allowance for effective implementation is required eg R&D tax credits need to facilitate more than reclassification of projects to gain fiscal advantage, and consideration of demand-side tools such as SBIR type programs should complement supply approaches.

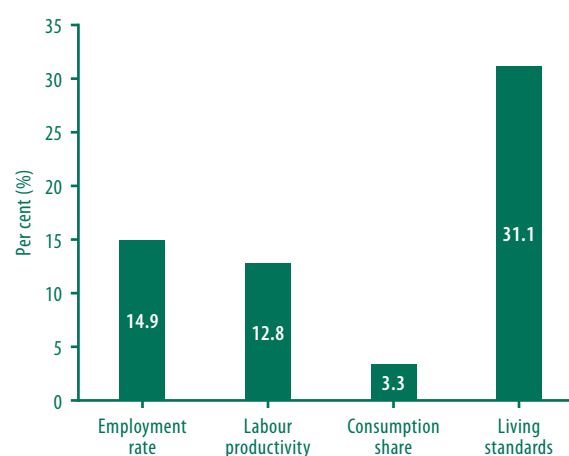
Sources: OECD 2013, *Science, Technology and Industry Scoreboard*, Paris; OECD 2015, *Innovation Strategy 2015*, Paris.

GDP per capita which rises to an almost 10% change from the baseline in the early years under the simulation provided by the modelling. Consumption per capita takes a little longer to improve but also improves well over the baseline. Both GDP and consumption per capita show gains to be around 25% to 30% stronger over the long-term than if no policy change was made.

The modelling provides simulations that show employment could be stronger and labour productivity higher if the changes happen, and living standards improve markedly (Figure 5.2).

In relation to industry sectors, the reforms benefit some industries more than others. In the Baseline Scenario, without reform, all broad sectors

**Figure 5.2: Combined scenario: sources of gain in living standards (% deviations from baseline, 2050)**



Source: Independent Economics 2015.

growth at average, annual rates of around 3% to 2030. Figure 5.3 shows how the gains in real GDP from the combined Institutional and Investment Reform scenarios vary by industry by 2030. Again, the point of comparison is the gain in total GDP in that year of 17.2%.

The biggest winner from comprehensive reform is manufacturing. This is because of the high rate of investment required to support a higher rate of economic growth. This lifts demand for manufactured investment goods. Agriculture is also a bigger winner, as it is boosted by free trade agreements (FTAs). The gain for mining is positive but relatively subdued because such activity of course depends heavily on the availability of mineral resources, and that does not change here. The gain in Government Services is also relatively modest, reflecting the modelling assumption that government spending is unaffected by gains in GDP per capita. Further, the gain in Housing Services is also relatively modest, because it takes time for the housing stock to expand in line with higher real incomes.

Building better foundations for competitive advantage ‘floats all boats’, though some industries benefit more than others. Naturally, this simulation for the project is looking at the effect of foundation policies alone. Further, industry-specific fine tuning, as well as wider developments, will have their own distinctive effects.

In the shorter term, out to 2030, employment is potentially stronger using both approaches together than under either the institutional or

investment scenarios. The modelling shows consumption nearly doubling as does GDP and real after tax wages are predicted to be higher than in either of the individual scenarios.

Importantly, there is a gain in real after-tax wages for low, middle and high skill employees under all of the scenarios. Under the combined scenario the average real after-tax wage rise is 21.5% by 2050 while the gain for low skill employees is 38.1% (Table 5.3).

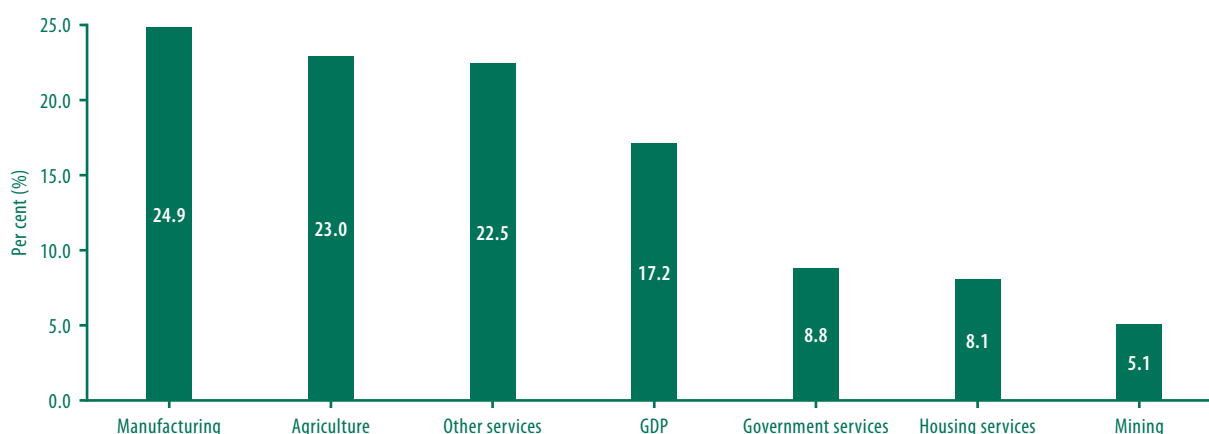
### 5.1.4 Conclusion

The modelling shows that broad based changes to both institutional reform and increases in investment for the future could have sustained benefits for the broad economy and society in the shorter and longer term. They could stimulate the private sector and underpin all of the industry sectors that are crucial to Australia’s future.

Society would benefit too through higher levels of employment and education shown in the policy paths that were modelled, with a much-enhanced standard of living with a higher after tax wage. Fiscal consolidation would also be feasible and facilitated.

And the report suggests that it may be easier to achieve reform if it is pursued across the board, covering most if not all of the key areas examined in the scenarios. Others may also be possible, but the included policy change covers a representative set of the reform areas under most discussion. A comprehensive package of reforms across both institutional change and investing for

**Figure 5.3: GDP by industry (% deviation from base, 2030)**



Source: Independent Economics 2015.



**Table 5.3 Combined scenario, broad economic effects (% deviation from baseline)**

Pay-off outcome	2030	2050
Total population	1.8%	9.0%
University education population	13.2%	33.8%
Employment	10.1%	20.5%
Consumption	24.1%	40.0%
GDP	19.3%	35.6%
Consumption per capita (living standards)	22.0%	28.5%
GDP per capita	17.2%	24.4%
Personal income tax (% point difference)	-11.7%	-17.2%
Real after tax wage	13.1%	21.5%

Source: Independent Economics 2015.

the future also allows for a coherent narrative for change and benefit. Also, because the benefits may appear more modest and the barriers large for one area of reform in isolation, while taken as a whole the areas where there are losers from change could be more than offset from the gains made in other areas. The nation as a whole gains from pursuit of comparative advantage through rebuilding the foundation of that advantage.

## 5.2 The peoples' view

### 5.2.1 Public attitudes

Any public policy reform process needs several elements to be successful. One of those is for the public to be convinced that the reform is necessary and that the proposed prescription is the right one.

To reform public budgets, at any given point in time people will have their own views about what they believe Governments should be spending taxpayers money on. The same will apply to institutional reform.

To allow for this, ACOLA commissioned a public preferences study to survey attitudes to and perceptions of public expenditure and policy reform for this project. 750 people aged over 18 were interviewed in February 2015 for the study. Box 5.3 provides a summary of survey methodology

There are some clear preferences indicated for how Governments should direct more or less spending, and also some strong indications of support for particular public policy reforms proposals. However some possible options for reform processes haven't received fulsome support.

### 5.2.2 Where should the money go?

There was a clear view from respondents where they thought governments should spend more money and whether they themselves would be willing to pay extra tax if that were necessary. Existing average spending levels for the various areas of government outlay were provided to respondents.

Those areas indicated in the survey responses for priority are:

- Health
- Schooling
- Transport and communications
- Tertiary education
- Social security for seniors
- Public order and safety

The areas were common across age groups and most educational levels (Table 5.4).

They are areas the respondents indicated they would allocate more of their tax dollars to as a proportion of their overall tax contribution, and areas where they think governments should spend at least a little more, if not a lot more.

### Box 5.3. SRC Public Preference Study—methodological explanation

This report presents the findings and documents the methodological aspects of the ACA Public Preference Study conducted by the Social Research Centre on behalf of ACOLA. This study involved a dual frame (landline and mobile) Computer Aided Telephone Interviewing (CATI) survey of 750 Australian adult citizens.

To ensure robust results and to correct for sample biases, the data was weighted to reflect the general Australian population with respect to gender, age and telephone status so that the results could be generalised as representing all Australians. 'Invalid' responses such as 'Don't know' and 'Refused' have been excluded from the weighted base for analysis unless otherwise indicated.

This report further contains significance testing to look for statistically significant differences between population sub-groups. All significance testing is conducted at the 95% confidence level.

The subgroups identified in this report are categorised by:

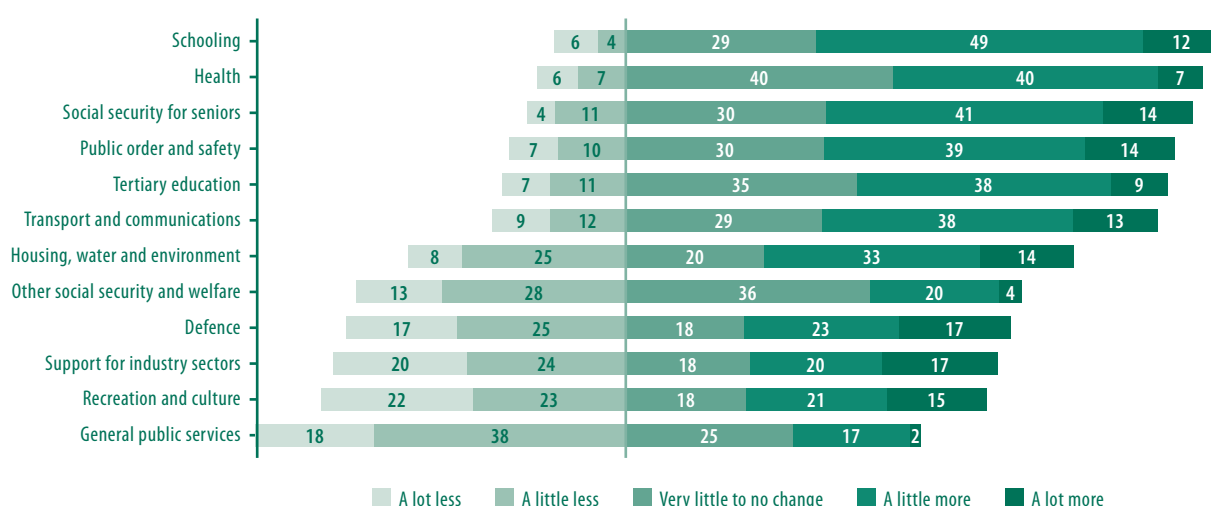
- age group
  - 15 to 34 years
  - 35 to 54 years
  - 55 years and older
- education level
  - 'Up to Year 12': primary or secondary (or equivalent) schooling only
  - 'TAFE': TAFE or other trade or technical qualification
  - 'University': University or CAE degree or diploma.

Table 5.4: Views on areas of Government spending by age and educational groups

By age group		
18–34	35–54	55+
Schooling	Health	Health
Health	Schooling	Schooling
Tertiary education	Tertiary education	Transport and communications
Transport and communications	Transport and communications	Public order and safety
Social security for seniors	Social security for seniors	Tertiary education
	Public order and safety	Social security for seniors
		Housing, water and the environment
By educational group		
Up to Year 12	TAFE/trade/technical	University
Health	Health	Health
Schooling	Schooling	Schooling
Transport and communications	Tertiary education	Transport and communications
Social security for seniors	Social security for seniors	Tertiary education
Tertiary education	Transport and communications	Social security for seniors
Public order and safety	Public order and safety	
Other social security and welfare	Support of industry sectors	
Housing, water and the environment		
Support of industry sectors		

Source: The Social Research Centre 2015.

Figure 5.4: Nominated change by area of expenditure (%)



Source: The Social Research Centre 2015.

Table 5.5: Willingness to pay more, by demographics (%)

Response	Age group			Education		
	18–34	35–54	55+	Up to Y12	TAFE	University
Be willing to pay whatever was required	24	22	17	17	17	24
Be willing to pay a little more	53	55	61	53	54	59
NOT be willing to pay more	23	23	23	29	29	17

Source: The Social Research Centre 2015.

There was much less support for increased spending on general public services, recreation and culture, defence and other social security and welfare although opinion is less clear cut when people were asked to say how much more or less should be spent on each area (Figure 5.4).

While the survey shows individual preferences for spending more or less in a particular area, the nominated allocations of a respondent's tax dollars typically only represented a small change or were relatively consistent with the current allocations of government expenditure. Yet such changes can add up.

In terms of pursuit of comparative advantage it is clear that there is some support for key foundations such as schooling, tertiary education

and infrastructure. The public is more suspicious of some individual welfare outlays and spending on defence and general public services, as well as recreation and culture.

### Paying the price

The changes the respondents would like to see would cost an average of \$1009 extra in tax per person each year. Across all adult Australians this does represent an annual \$19.6 billion.

And a majority of respondents were willing to pay. More than half were willing to pay a little bit more tax a year and one in five was willing to pay whatever was required to achieve the levels of support they preferred (Table 5.5).

## 5.2.3 The reform challenge

### Policy change

There also seems to be willingness to support possible policy changes that represented investing in the nation's future.

Seven possible such changes were put to the respondents and there was more than 80% total support (combining those who strongly support and those who 'somewhat support') for six of them. The seventh, lifting net overseas migration with a greater focus on skilled migration, had a slim majority supporting it with more than a third opposing (Figure 5.5).

Spending on some current consumption areas would also be supported as was reported above, but the focus in the policies examined here was on public investment options rather than consumption and transfers.

There are significant differences in the strength of support between the different age groups and the different education levels for several of the policy proposals examined including lifting overseas migration, pursuing better childcare support and the targeted labour force reforms.

The respondents who strongly supported reforms were asked to rank which ones they considered the most important. Many more people chose

the increases in funding for higher education and for infrastructure as important as those who chose the labour force reforms or increases in overseas migration.

### Institutional or structural reforms

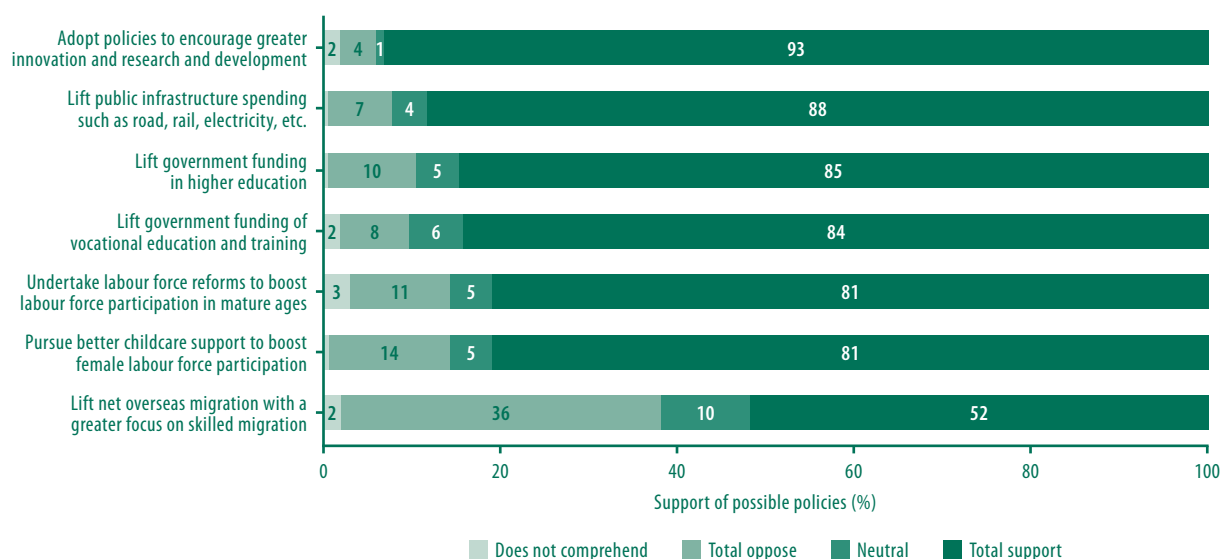
The respondents were less enthusiastic about possible structural or revenue and competition reforms. Of five reform options put in the survey, only two received support from a majority of respondents. Two proposals, which included a lift in the GST, were opposed by a majority of those surveyed.

Interestingly labour market policy change and competition policy change were acceptable. Tax and tariff reform are regarded with less enthusiasm.

Nevertheless GST change for investing in the future was regarded more positively than for reducing the tax burden (Figure 5.6). This is pertinent to the political leadership issue to be discussed below.

Again there were some variations between the different demographic groups. The biggest differences in the age groups were in support for the pro competition and the labour market flexibility reform proposals, and the latter also had the most significant differences between educational levels.

Figure 5.5: Support of possible policies (%)



Source: The Social Research Centre 2015.

Other reforms might also have been examined. The report has focused on those most linked to economic outcomes and mentioned in the reform literature such as the IMF (2015). Selection was also guided by the availability of existing modelling estimates of the pay-offs to such reforms individually, as discussed in section 5.1, so that the public preferences could be checked against the possible outcomes for a package of such reforms as quantified in the modelling commissioned for the project. Future policy might wish to vary the precise content of any such package of policy change, but it was felt important to gauge opinion for a reasonably comprehensive sample of such policy and examine its corresponding potential impact, where sufficient evidence existed to allow this.

### 5.2.4 Conclusion

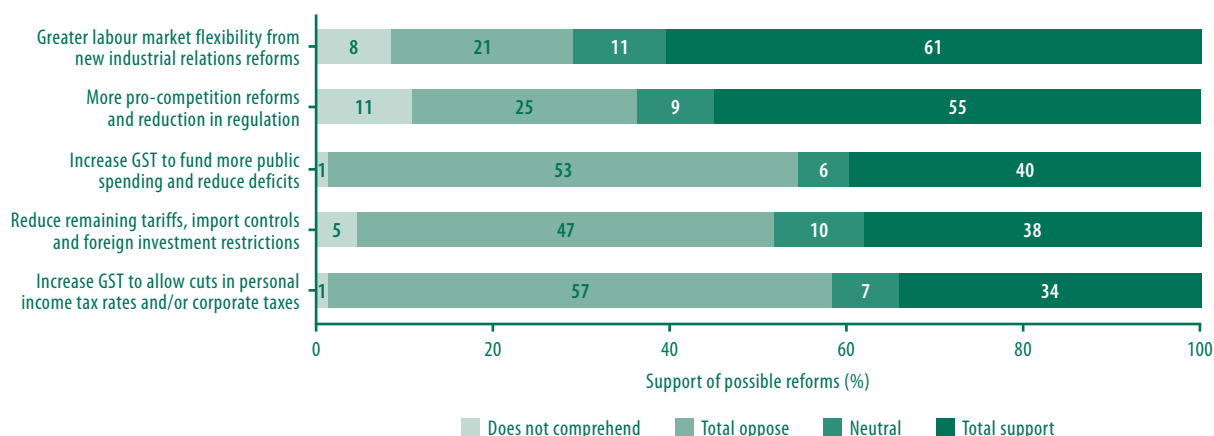
Surveys of public opinion do not simply tell a government what it should be doing in order to win public support, they also point to gaps where the public has not yet been convinced a change is necessary. There are some clear messages from the survey of public perceptions about what people would like to see from public expenditure and that they would be willing to pay a little bit more to see those aims achieved. The hard work for governments though is in the way change is achieved either through policy change or a reform process.

Some of the findings of this survey indicate that respondents found some of the reforms presented difficult to understand and this may have affected their level of support or opposition. The results highlight the importance of communication and leadership in the public debate. But they also indicate that a future investment agenda will be more readily endorsed than most purely structural reform measures. Innovation, infrastructure and education resonate but tax changes and immigration policies are more fraught.

## 5.3 Leadership and partnership

There is a real need for political and policy leadership in Australia. This is a consistent result across various stakeholder surveys. The comprehensive research undertaken for this project has shown that such leadership secures long-term national wellbeing by persuading the public and key stakeholders as to the role of policies for national benefit. However, success depends both on identifying what the appropriate policies are, and on effectively implementing them. Accordingly, partnership is seen as a necessary complement to leadership, since it underpins understanding and co-operation, and both are further considered in this section.

Figure 5.6: Support of possible reforms (%)



Source: The Social Research Centre 2015.

## 5.3.1 Leadership

### Political and business leadership

This report has identified some reform directions that would help enhance Australia's economic prosperity in the time ahead for the country. It has also acknowledged some major co-conditions that should be recognised if Australia is to advance with fairness and with sustainability.

The project has also established that there are differences in understanding about what might be needed in some areas, as with divergent perspectives on some issues highlighted in contrasting survey findings for business representatives and for public servants within Australia, or as between overseas executives and Australian based executives regarding Australian strengths and weaknesses in other areas.

At the same time there is much common ground in perceptions for these groups that can be built upon, and there is much acceptance by the public in Australia of the need for change and for reform in order to build a better future.

However a lesson of the previous major reform era in the latter decades of the previous century was that substantial discussion and sharing of perspectives substantially facilitated the process of reform then. Leaders across business, government, politics and the community all played a role in elucidating the nation's situation and the options before us, so developing some constructive consensus or, at least, clarity (Withers & Gupta 2013).

In the surveys of opinion for this project there was some concern expressed that such constructive leadership had fallen away in recent years and needed refreshing. To a degree this can be a matter of personalities. It can also be a product of disengagement after a long period of relative success. Mancur Olson (1982) identified problems that can emerge from sustained periods of prosperity and stability, both through attitudes of people but also especially through the formation of entrenched defensive interest groups. Garnaut (2013) has applied this logic to current Australian policy.

But more than that, structures for discourse have also changed. Examples are:

- changes in capital markets which limit opportunities for longer-term investment
- changes in universities that emphasise basic global research and not engagement and impact
- changes in community organisations that orient them increasingly to business delivery more than policy representation
- changes in media that shift the balance to direct social media participation more and editorial analysis less
- changes in politics where disengaged voters become swinging voters rather than more 'rustured on participants'.

That said there is nevertheless an increasingly educated electorate that is coming to recognise that there are some hard choices ahead for Australia as a nation and is evincing a willingness to engage these issues sensibly. This electorate is disenchanted by the quality of leadership it observes, especially in politics but also in business. In this report a number of changes that would emerge under reform would help reinforce leadership advance. For instance the following initiatives would assist:

- redefinition of the federal compact with greater clarity of roles and responsibilities as between the different levels of government would reduce the 'buck-passing' that so irritates voters
- incorporating impact and engagement measures as part of university responsibilities alongside basic research and education with associated funding and support would encourage academics to contribute more to helping solve Australian social, economic and environmental problems from an independent source of ideas
- reform of public sector administration procedures whereby all expenditure projects of substantial size would undergo transparent evaluation of the kind used for regulation and taxation initiatives so as to reduce 'pork-barrelling'

- provision of continuing employment options for senior civil servants so that they can offer frank and fearless rather than responsive advice to the elected governments
- increasing the compulsory superannuation rate to provide for the ageing population would have the additional benefit of increasing the segment of the investment finance market that can take a long-term perspective on its investment portfolio
- increasing the application of income or profit contingent loan arrangements that have been distinctively developed in Australia to reduce the tax burden and, in this context, increase the risk sharing that allows a longer-term perspective to have greater weight in areas such as small business R&D
- lifting management skills through best practice education and industry association mechanisms that allow development of systematic evaluation of business proposals and initiatives.

Other enhancements could be considered ranging from transparency requirements on political pre-selection processes to enforceable rules regarding employment post-public office. But the point is that the reform process needed for the economy and society can extend to the rules governing the operation of the government, business and community sectors in the direction of increasing public trust and allowing longer-term vision to play a greater role. The evidence from this project's surveys of attitudes and perspectives shows that such change is much sought by both key stakeholders and the wider public.

There also seems to be an appetite for policy ideas again in the light of recent lacunae here. The great political debates of contemporary times, and also of the last century, have focused on the relative roles of government and the market, the relative rewards for labour and capital, and the relative importance of growth and equity as policy priorities. Such issues are resurfacing but must be subjected to a rigorous contestation in the marketplace of ideas, and reflect the perspectives of different groups of stakeholders and including Australian

relevance. This includes academia, policymakers, community and business sectors from diverse fields and disciplines, procedures, institutions and commitments that would support such an approach would ensure that ideas to get tested on their merit and evidence.

Secondly, mechanisms must be created that allow ideas and policies thus articulated to be effectively implemented. Much policy failure is actually failure of implementation, especially in areas of service delivery and where policies involve long-term engagement and investment. Typical examples are in healthcare, infrastructure, and education. The difference between good policy development and implementation has often been called the 'know-do gap', and bridging this gap is a major challenge for nations. Investment in knowledge management for public policy is as much a key to the future here, as it should be for knowledge in best practice business management.

This section considers and evaluates these priorities in the Australian context, and proposes lessons for the future. Specifically, it looks at the illustrative case of the importance of independent, world-class think tanks to drive policy research and development. In the next section the report looks at the effectiveness of public-private partnerships (PPP) in implementing policy delivery.

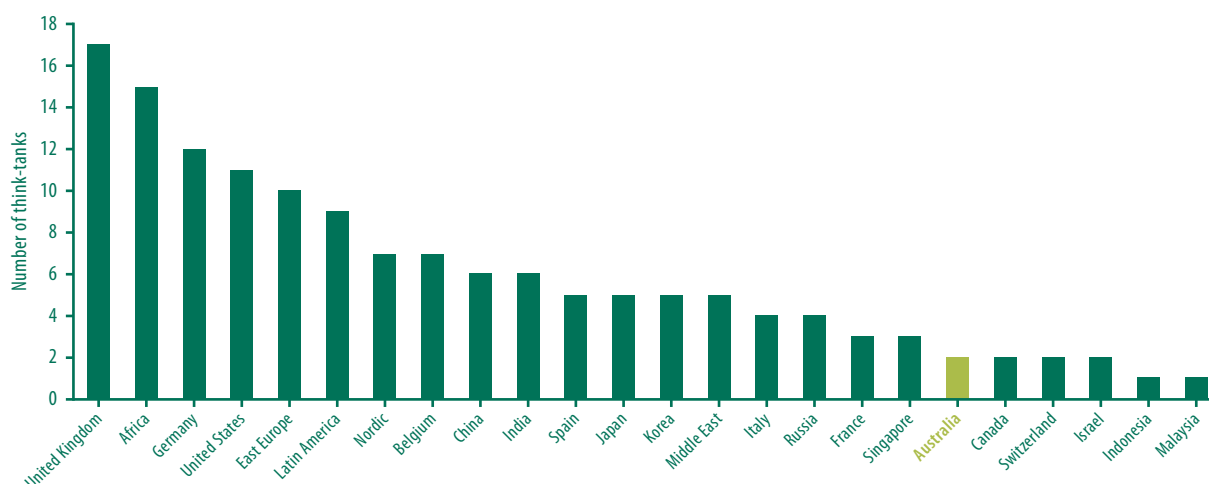
### Ideas leadership

Around the world, think tanks are a key venue for ideas leadership. They bring together the best minds from the academic, policy, political, community and business worlds to discuss and find solutions to complex problems. This representation is also both multi-dimensional and multidisciplinary, which prevents a siloed assessment of problems. In the best case, think tanks can offer strategic doctrines that help to guide national policies towards complex challenges.

However, the tradition of independent think tanks (and their contribution to the policy process) is arguably still too weak in Australia. As a result, there is hardly a robust mechanism for a proper public contestation of ideas, let alone to



Figure 5.7: Number of globally ranked think-tanks by country/region



Source: McGann 2014.

reflect the perspectives of different stakeholder groups fully. This ACA report considers this to be a strategic weakness for Australia. Australia's strong educational and skills standards and world reputable universities would offer natural strengths and complementarities that could be leveraged to develop a strength in research-based policy-making.

Currently, a key mechanism for incorporating research and public input into the policy-making process comes from public and expert representation in the Parliamentary Committee process or when the Productivity Commission invites submissions for its reports. However, even this process has its weaknesses so that benefit from complementary institutions would still ensue.

If it is accepted that think tanks are generally a respected and credible mechanism for robust research and advocacy, let us consider how well Australia performs in this metric. The chart below shows a list of the world's top 150 think tanks identified by the University of Pennsylvania<sup>3</sup>.

According to this, Australia has only two ranked think tanks in the world top 150. While it may be tempting to conclude that Australia does not fare much worse than other advanced countries such as France, Singapore, Canada, and Switzerland,

it must be remembered that these countries are within close proximity to others that have highly developed research-policy linkages. Where ease of travel and (often) common languages would facilitate frequent interpersonal interactions and idea exchanges in these regions, Australians find it both expensive and time consuming to extensively participate in these overseas forums. It is therefore to be expected that the flow of ideas into Australia would, *ceteris paribus*, be more constrained than in other regions of the world. Indeed there is scientific evidence that ideas have a 'half life' of 1200 kilometres and reduce by 30% at borders in their transmission (Figure 5.7).

A further detailed analysis raises more issues of concern. Table 5.6 shows how Australian think tanks by areas of research perform in one global ranking.

Recognising that these ranking exercises may have their own issues as to sample, selection criteria, classifications and more, it is nevertheless worthy of attention that for the following areas that are widely accepted as being of strategic importance to Australia, there are no globally ranked Australian think tanks in:

- Education
- Energy and resources
- Health policy
- Transparency and good governance
- Migration

3. The *Global Go To Think Tank Index Report* by the University of Pennsylvania, which monitors over 6000 think tanks around the world. The results for countries in Africa, East Europe (excluding Russia), Latin America, and Middle East (excluding Israel) are combined in their respective regional groupings for expositional convenience.

**Table 5.6: Global performance of Australian think tanks by area of research**

Research area	No. of Aust. think tanks	Name of Australian think tanks	Ranking
Defence & national security	1	Australian Strategic Policy Institute	17/65
Domestic economic policy	1	Grattan Institute	56/80
Social policy	1	Grattan Institute	43/50
International economic policy	2	Australian Institute for International Affairs	25/50
		Centre for Independent Studies	29/50
Environment	1	Australia Institute	30/70
Foreign policy and international affairs	1	Australian Strategic Policy Institute	28/65
International development	1	Lowy Institute	80/80

Source: McGann 2014.

So even though each of these have been identified as sources of national strength in the commissioned research or the global benchmarking analysis work done for this report, these results raise questions about the adequacy of research being pursued in these areas and/or how well these results are feeding into the policy development process.

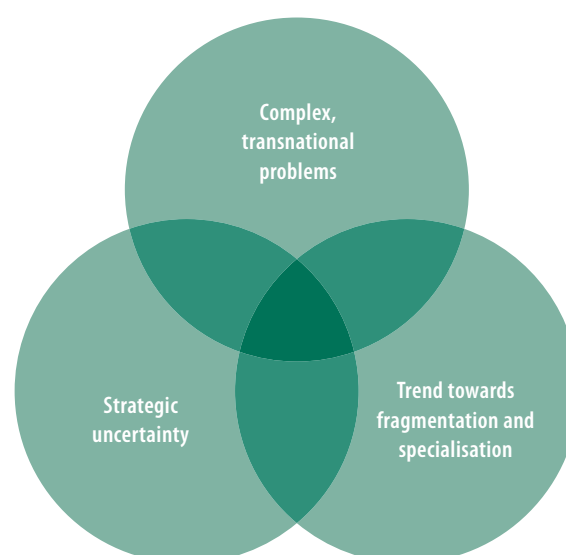
At the very least, they certainly bring into focus the need for the increased policy-research collaboration that is commonly called for in government reports and various policy statements.

A dominant theme for this report is the strategic complexity and uncertainty that will influence Australian policy-making, as seen in this project's Figure 5.8. In such an environment, it must be accepted that no single group or player will have all the skills and knowledge needed to deal with the most important problems likely to confront Australia. Moreover, as the 21st century progresses, it is becoming clear that major policy and paradigm changes will be needed.

The examples of think tanks given in Table 5.6 are all private sector, though there are varying public and private sector linkages e.g. taxation deductibility of donations, grants, university linkages, etc.

The degree of independence they have is an important component of their role, as is that of research centres in universities. The latter tend to be disciplinary oriented under university research

**Figure 5.8: Strategic environmental characteristics**



imperatives. When inter-disciplinary they can be short-lived. Yet holistic review is often what decision-makers seek.

Equally, many government think tanks can be short-lived. They become easy prey when they challenge policy or when budget savings are needed as they do not deliver immediately evident necessary services.

The history of entities such as the Bureau of Labour Market Research, the Bureau of Industry Economics, the Bureau of Immigration, Population and Multicultural Research, and the Australian Institute of Criminology show the failure to maintain enduring research knowledge within government.

The Productivity Commission has an enviable reputation and plays an important continuing role, as do some other more specialised research and analysis agencies within government. Such agencies, and especially the Productivity Commission, will be quite crucial to informing and fostering progress in the structural and investment reform arena emphasised by this present report. But ultimately the piper can call the tune, directly or subtly, over the activities of agencies within government, so that a healthy portfolio of think tanks across government and outside government has to be part of the answer to well-attested policy for the future.

These considerations point to a need for a systematic analysis of policy for policy knowledge. It is inadequate and unreliable in Australia. More is needed for proper enduring settings if building our comparative advantage is to be properly informed.

### 5.3.2 Partnership

Leadership can be reinforced by partnership in establishing social trust in our institutions and decisions over their future possible directions. It is often said this is one reason for the enduring relative success of the Scandinavian societies by a range of performance measures. Arguably though, Anglo-American societies have a greater individualistic component in their cultures. Australia reflects this in how it actually blends public and private in the provision of much in its economic and social spheres.

In Australia the public and private spheres are inextricably mixed under partnership arrangements. This is the Australian model for the welfare state and it is quite distinctive and more developed along these lines than in almost any other country. The general principle is for the state to provide a foundation or safety net and for there to be incentives for separate or additional private provision with additional provision still to be voluntarily provided privately. It is sometimes characterised as a 'three pillar system' and, in retirement income, for instance, has been so

labelled by the World Bank and held up as 'best practice' (Holzmann & Hinz 2005) (Box 5.4).

Overall, Australia has one of the lower proportions of public spending and taxation as a share of GDP in the OECD countries (OECD 2014e). This is because of this partnership system, so producing a quite 'economical' welfare state, yet one with a relatively complete floor of basic provision. In their typical pragmatic way, it is rarely articulated by Australians as a conscious system overall. Arguably it has simply evolved this way. It encompasses though at least the following:

- retirement income with basic public pensions plus compulsory privately managed superannuation plus tax advantaged voluntary private superannuation
- child care with extensive public and community provision alongside private for profit child care
- public and private hospitals
- public policing and prisons but with extensive private security services and contracted private prisons and detention facilities
- public broadcasting and private broadcasting
- public schools and private schools
- public private partnerships in water, electricity, gas, roads and railways
- public employment support with contracted private employment services
- university fee and living expense subsidy for students combined with repayable loans and substantial self-reliance through market work.

There are numerous nuances in relation to the actual balance achieved, the role of private not-for-profits versus for-profits and changes over time as with, say, airlines or health insurance (as illustrated in Table 5.7, which outlines typical privatisation options facing governments). But an enduring Australian mix of various such options has been evident more than in most places. In the social security system the reduced burden on the state and hence taxpayers has been aided by means-testing and flat-rate welfare benefit provision.

The point is though that these arrangements do underpin and reinforce much of the legitimacy

#### Box 5.4: Economical social protection: retirement

Social protection narrowly defined is pensions, unemployment benefits, family allowances and cash welfare payments or tax allowances. Australia has the third lowest share in GDP for such outlays in the OECD (after US and Japan) and the lowest once tax allowances are factored in.

For retirement income the World Bank has recommended a 'Three Pillar' retirement protection system as best practice and saw Australia as the first country to develop this. The Pillars are: First Pillar: where the objective is safety net social protection for a minimum living standard post-retirement. Recommended by the World Bank to be paid as a defined benefit and funded by the state on a pay-as-you-go basis. Second Pillar: where the objective is maintenance of previous living standards in retirement. Recommended by the World Bank to be paid as a defined contribution benefit and funded by compulsory private payment. Third Pillar: where the objective is additional retirement income provision on a voluntary basis that may or may not be tax-advantaged.

In Australia the First Pillar has the following features:

Age pensions available for 65+; Benefit is flat-rate: 25% of average wage or 40% for couples; Incomes and Asset-tested (though owner-occupied homes are exempted); Full or partial payment: 80% receive full; Supplementary benefits e.g. health card; High coverage: 80%; General revenue funded; Payments through an arms-length public agency (Centrelink).

The Second Pillar has the following features:

Publicly mandated but privately funded, managed and delivered; A defined contribution scheme: 9% of earnings paid by employers and 3% by employees and fully funded; Individual, fully vested, portable accounts with industry or generic funds managers or own fund; Has tax-favoured status-though difficult to measure due to multi-stage rather than entry or exit tax only.

The Third Pillar has the following features:

Voluntary additional contributions by employees to defined contribution accounts to receive same tax status; Only tax preferred vehicle for retirement savings; Some 60% of full-time and 25% of part-time workers make contributions; Contributions average 6% of earnings.

In analysing the Australian system it can be said that the First Pillar is economical mostly because of its flat rate provision not means testing, which is liberal. Compared to the OECD average publicly funded pension, 70% of savings for the Australian model come from the flat rate specification and 30% from means-testing. The First Pillar scheme is universal, without holes in the safety net, and therefore also non-discriminatory with respect to past labour force status e.g. unemployed, women at home, self-employed.

Australia's Second Pillar means unfunded liabilities of government are small overall and are First Pillar related only. But means-testing means administrative complexity in the First Pillar and the flat rate means some supplementary schemes for special needs are also required such as for renters, disabled, health problems and carers-which further raises administrative complexity including need for 'deeming' provisions. Means-testing induces poverty traps and efficiency losses through high effective marginal tax rates on private savings (especially for the lower income groups obliged to save under the Second Pillar) and on ongoing labour earnings (especially for early retirees)

Second and Third Pillar provisions are complex and confusing for account holders in relation to fees and entitlements and tax effectiveness and their retirement income is uncertain and risky under defined contribution payment. First and Second/Third Pillar intersections distort decision-making with respect to asset accumulation (e.g. housing) and dissipation (e.g. lump-sum payments), and Second Pillar contribution rates need to provide for increasing longevity and so must be set at adequate levels if full private financing is not to be challenged.

Finally, superannuation funds under private management raise issues of: regulation for probity and security, fee levels, social investment, investment choice, and investment advice. And there is ongoing controversy as to whether Second Pillar/Third Pillar arrangements produce net increase in national savings ratios relative to publicly funded schemes for retirement-with consequent interest rate implications.

Design and management of a public-private partnership system is therefore not simple. But the macro benefits can be worthy of the micro costs. Australia's poverty reduction index is the highest for effectiveness in the OECD. Yet the pressure of an ageing population promotes close attention to ongoing improvement in this area.

**Table 5.7: The privatisation spectrum for public-private service provision**

Option	Ownership	Operations	Finance	Risk	Duration	Application
Service Contract	Public	Public/Private	Public	Public	1–2 yrs	Chile
Management Contract	Public	Private	Public	Public	3–5 yrs	Gaza
Lease	Public	Private	Public	Shared	5–15 yrs	Poland
BOT	Public	Private	Private	Private	20–30 yrs	Australia
Concession	Public	Private	Private	Private	25–30 yrs	Argentina
Divestiture	Private	Private	Private	Private	Indefinite	England

**Table 5.8: Private funding share of education expenditure, 2011 (%)**

	Pre-primary	Primary & secondary	Tertiary	All education
Australia	45.5	83.6	45.6	72.3
OECD	81.6	91.4	69.2	83.9

Source: OECD 2014a.

of economic and social arrangements in Australia. Yet they are typically examined only in a piecemeal way and they can be eroded with growth of 'middle class welfare' or ad hoc changes. Accordingly, for the present, it is possible that major changes to this system without comprehensive public analysis, evaluation and discussion would undermine the trust through partnership that seems to operate, despite some frustrations in the negotiations over the contested borderlines between the public and private spheres.

Much of the history of the twentieth century has been a battle between the public and private spheres. Australia has reached a distinctive compromise that might well be a basis for ongoing national stability, and hence should only be altered after careful consideration and recognition of the principle, practice and context involved.

For the purposes of this ACA project a key litmus test will be the future funding of the universities. For this year 2015 there was much debate over university deregulation and funding and participation in Australia. One sticking point was a trade-off being considered between university fee deregulation for domestic undergraduate students and a corresponding reduction in per student public funding.

The Australian notion of public-private partnership here was being moved more into the private sphere and university public funding, which is at the low end of OECD shares of GDP might have been further reduced (Table 5.8). However demand driven enrolments being opened up further made for a complicated calculus over prospective public versus private shares

The difficulties encountered in taking such policies forward illustrate the value in considered public deliberation informed by analysis and evidence if policy stalemates or unstable outcomes are to be avoided and IF the public is to feel secure in accepting new directions in policy.

The survey of public perceptions earlier in this chapter indicates the public may be willing to not only accept policy change but also be prepared to contribute something by way to increased tax towards paying for it.

It does also show that the types of institutional reform modelled by independent Economics may comprise the harder task. But this is where, from historical experience, leadership and a considered public policy process where both the need for change and the proposed change is explained and debated at some length has been

successful in the past and this provides a way forward for successfully prosecuting the case for the reform such as that outlined in this report in order to ensure Australia builds and sustains its comparative advantage into the future.

The respective roles of the various social partners in this exercise were subject to some evidence gathering for this project. In particular the public sector officials surveyed as part of the stakeholder review evaluated the current performance of key stakeholders. It saw academic and community group contribution as very good, but rated our elected representatives, unions and traditional media as problematic (Figure 5.9).

Ideally, strength across the board is desirable if policy change is to be implemented well. Informational strength is part of this, as is countervailing power. The latter can stymie reform but in the long haul it is arguable that the contestation is more important than expediency.

Review of mechanisms for building stakeholder strength would be a welcome project important for our future.

### 5.3.3 Leadership and partnership combined

In looking at case studies for this ACA report it was established that the interaction of these can be crucial and that ensuring that both are strong will be instrumental for building the foundation for Australia's future.

To illustrate this concretely, the report includes two such case studies in Box 5.5.

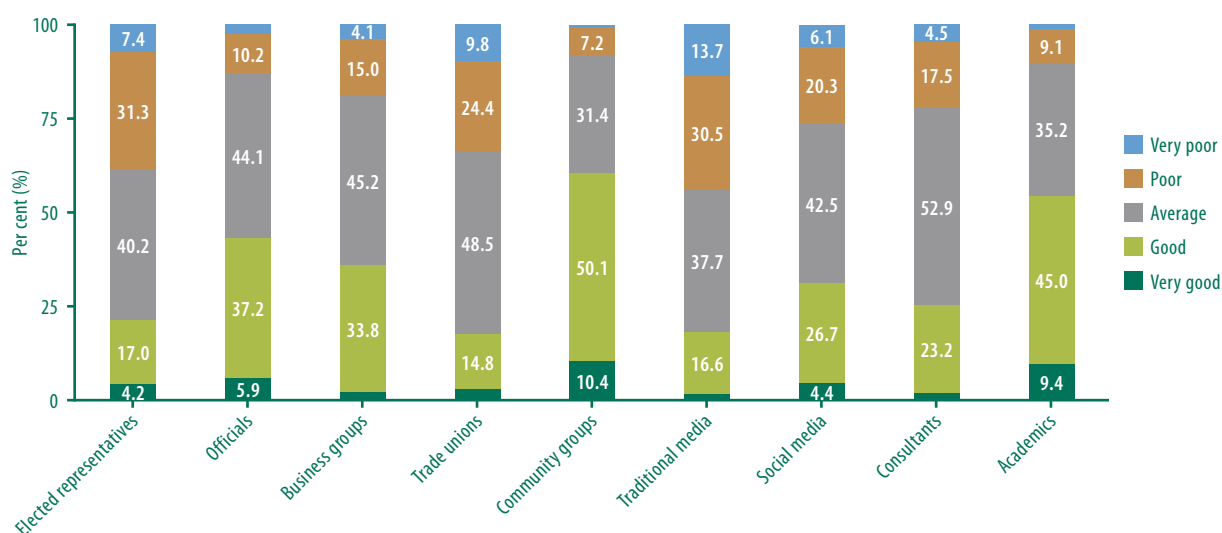
More recently it is encouraging to see major non-governmental groups coming together in leadership and partnership over climate change. The options for promotion of economic growth over the decades ahead may be argued to be incomplete without understanding of the risks and costs of climate change driven factors such as rainfall changes, increases in fire risks, changes in ecosystems and the costs of adapting to increases in extreme weather events (both cyclones and floods) and sea level rise (Global Commission on the Economy and Climate, 2015). This is why the coming together of major business, union, research, environment, investor and social groups is promising.

This coalition has determined a joint set of principles that constitute agreed common ground on how to approach a more certain and meaningful set of policies towards emissions reduction.

The organisations forming this roundtable are the Australian Aluminium Council, the Australian Conservation Foundation, the Australian Council of Social Service, the Australian Council of Trade Unions, the Australian Industry Group, the Business Council of Australia, the Energy Supply Association of Australia, the Investor Group on Climate Change, the Climate Institute and WWF Australia.

In a statement of 29 June 2015 the roundtable stated that 'Australia should play its part in global

Figure 5.9: Rating of the performance of stakeholders in advancing the Australian public interest



Source: Kumar 2014.

## Box 5.5: The reform experience: interaction between politicians, the community, business, and external policy institutions

### The GST

The shift away from reliance on direct taxation and the introduction of a form of value-added taxation had a long history in Australia.

The Asprey taxation review that was commissioned by the McMahon Government in 1972 and reported in 1975 recommended a broad based value added tax on goods and services.

However the option was not taken up by either the Whitlam or Fraser Governments.

Paul Keating as Treasurer developed an option to broaden the indirect tax base through a tax on the consumption of services, known as Option C, and this was put to a national taxation summit held in 1985. It was rejected at both the summit by business, welfare organisations and unions, and at the Cabinet level.

John Hewson, as leader of the Opposition in 1991, included plans for a 15% Goods and Services tax in his Fightback! Policy that formed the basis of his campaign for election in 1993. (The Opposition was assisted in the preparation of the policy by Neil Warren from UNSW who himself had a long history with taxation reform proposals; He was seconded to EPAC [the Economic Planning Advisory Council] in the lead up to the 1985 taxation summit.)

The Fightback! policy was fiercely opposed by the Labor Government that was returned to office at the 1993 election.

While John Howard as Opposition leader in 1995 had ruled out ever introducing a GST, in Government he and the Treasurer Peter Costello began considering one after coming to office and in 1997 plans were being actively considered for the introduction of a broad based goods and services tax.

There were some important changes that helped the Howard Government. A High Court decision in 1997 ruled a number of state indirect taxes unconstitutional. Business and the Australian Council of Social Service had discussed the need for taxation reform at a joint community summit in October 1996. While ACOSS continued support for tax reform, it eventually expressed doubts about the equity of the GST proposal. But business continued to strongly support it including launching a two stage advertising campaign in favour of it in 1998.

The government learned the lessons from previous attempts and proposed a number of changes from previous models including a lower rate for the GST than John Hewson had proposed and a 'lock-in' mechanism via legislation to mandate any future changes would only happen with support from the Commonwealth, State and Territory governments. The government also spent considerable time outlining the flaws of the wholesale sales tax system that the GST proposed to replace. And this time around there was political will from the Prime Minister as well as the Treasurer for the introduction of the tax.

efforts' and 'avoiding unconstrained climate change would provide important benefits and opportunities to Australia' (Grattan 2015).

Such an initiative provides a source for optimism for future policy deliberation in Australia. Likewise in another important area forty indigenous leaders met with both the Prime Minister of Australia and the Leader of the Opposition together at Kiribilli House in Sydney on July 6. The meeting was to discuss the constitutional issues around 'recognition' for Australia's first peoples and the development of appropriate referendum questions for putting to the Australian people.

Developments of this kind send a much needed constructive message in leadership and partnership coming together for the future.

## 5.4 Conclusion

Having defined the pathway to building Australia's comparative advantage, securing that future remains a challenge. It involves making clear the benefits that can be gained, and the modelling approach adopted for this purpose validates the worth of that. Likewise, the Public Preference Study commissioned for this project has made clear that the wider Australian electorate is likely to be supportive of and responsive to these possibilities. The big task that remains is ensuring that the leadership and partnership that is also needed for this change can be forthcoming.



It was not popular with the public and was strongly opposed by the Labor opposition. The Coalition only narrowly won the subsequent 1998 election at which it put the proposal to the people before its introduction. But the GST became law in 1999 and has been in operation since 2000.

### National Disability Insurance Scheme

The introduction of the national disability insurance scheme was a different piece of public policy reform. While like the GST it had been proposed some decades before its introduction, unlike the GST it had not been the subject of a lengthy political debate stretching over years. It re-emerged as one of the 'big ideas' raised at the 2020 summit held by the Prime Minister Kevin Rudd. The Government then referred it to a Productivity Commission inquiry in 2010 to look at a national disability long-term care and support scheme. The terms of reference included as an option a social insurance scheme.

Community support was built by through a joint effort by disability organisations in the Every Australian Counts campaign. The policy was supported by the Coalition Opposition, although at times the Opposition raised questions about how it would be funded.

The Government considered a number of options for funding the scheme and despite initially ruling out the option, proposed an increase in the Medicare levy of 0.5% to help fund the cost. This was supported by the Opposition with some caveats.

Unlike the GST, the NDIS had support from the then Opposition. It was also widely supported by the key stakeholders. The Government put time into explaining the need for the scheme to the public and harnessing the support of the stakeholder groups, particularly the disability community for both joint public appearances to explain the scheme and as a pressure group external to politics to support the scheme.

The proposal had overwhelming public support even though it included a tax increase with an opinion poll conducted after the deal to increase the Medicare levy was done showing more than three quarters of voters (including 87% of Labor voters and 74% of Coalition voters) supported the scheme. (Source: Newspoll *The Australian* May 7, 2013).

What these two reform proposals demonstrate is the effectiveness of political leaders putting in effort to explaining the problems the proposed change is seeking to solve, and the worth of getting support from third parties such as key stakeholders outside the political system.

The NDIS was framed in a way that won public support and eventually made it hard for those with questions about how it would be funded to oppose the scheme. The GST didn't win public support but instead was an example of the willingness of the leadership, backed by key stakeholders, to pursue a change they believed was necessary.

## 5.5 Findings

- Concentrating on boosting investment will have longer lasting economic benefits than competition policy changes, while combining the two in across the board reform will bring the greatest benefit.
- It may be easier to gain public support for policy change in specific areas while structural reform may require more work to convince the public of the necessity for change.
- People are willing to contribute at least a little more to fund the costs of reform.
- There is a need to clarify the roles and responsibilities in the federal system. Confidence could be built with the transparent evaluation of government spending projects of a substantial size.
- Leadership skills need to be lifted at the management level. Leadership in ideas could also be built through think tanks. Universities could have impact and engagement strategies as part of responsibilities.
- Australia has a unique blend of public and private in the provision of economic and social spheres and this could be built on as a basis from ongoing national stability. Income contingent loans could be increasingly applied in areas such as small business and research and development.

# References

- ABARES 2013, *Agricultural Commodity Statistics 2013*, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra.
- ABS 2006, *Australian and New Zealand Standard Industrial Classification 2006*, cat no. 1292.0, Australian Bureau of Statistics, Canberra.
- ABS 2012, *Innovation in Australian Business*, cat. no. 81580D006\_201011, Australian Bureau of Statistics, Canberra.
- ABS 2014a, *International Trade in Goods and Services, Australia, Time Series Workbook*, Australian Bureau of Statistics, Canberra.
- ABS 2014b, 'Table 33', *Industry Gross Value Added, Chain volume measures—Annual*, cat no. 5206.0, Australian Bureau of Statistics, Canberra.
- ABS 2014c, 'Table 11b', *Services Debits, Original, Current prices—Quarterly*, cat no. 5368.0, Australian Bureau of Statistics, Canberra.
- ABS 2014d, 'Table 11a', *Services Debits, Original, Current prices—Quarterly*, cat no. 5368.0, Australian Bureau of Statistics, Canberra.
- ACFS 2013a, *Funding Australia's Future: From where do we begin?*, Australian Centre for Financial Studies, Melbourne.
- ACFS 2013b, *Funding Australia's Future: Improving Australia's Financial Infrastructure*, Australian Centre for Financial Studies, Melbourne.
- ACIL Allen Consulting 2014a, *Australia's Comparative Advantage in Agriculture. A report for the Australian Council of Learned Academies*, ACOLA, Melbourne, accessed from <<http://acola.org.au/index.php/australia-s-comparative-advantage-contributing-reports>>.
- ACIL Allen Consulting 2014b, *Australia's Comparative Advantage in Services. A report for the Australian Council of Learned Academies*, ACOLA, Melbourne, accessed from <<http://acola.org.au/index.php/australia-s-comparative-advantage-contributing-reports>>.
- Agarwal, R, Galasso, A & Oettl, A 2015, *Roads and Innovation*, CEPR Discussion paper DP 10113, London.
- Agarwal, R, Selen, W, Roos, G & Green, R (eds) 2015, *The Handbook of Service Innovation*, Springer-Verlag, London.
- Akerlof, GA 1970, 'The Market for Lemons: Quality Uncertainty and the Market Mechanism', *The Quarterly Journal of Economics*, vol. 84(3), pp. 488–500.
- Ang, I, Tambiah, Y & Mar, P 2015, *Smart Engagement with Asia: Leveraging Language, Research and Culture*. Report for the Australian Council of Learned Academies Australian Council of Learned Academies, Melbourne <[www.acola.org.au](http://www.acola.org.au)>.
- Armstrong, S 2015, 'The Economic Impacts of the Australia-United States Free Trade Agreement', *AJRC Working Paper #1*, Australia-Japan Research Centre, Crawford School of Public Policy, The Australian National University.
- ATSE 2013, 'Dreamliner is real collaboration', *Focus*, no. 180, p. 8, Australian Academy of Technological Sciences and Engineering.
- Australian Council for Education Research 2014, *Australasian Survey of Student Engagement (AUSSE)*.
- Australian Government 2012, *Australia in the Asian Century: White paper*, Australian Government, Canberra.
- Bell, J, Frater, B, Butterfield, L, Cunningham, S, Dodgson, M, Fox, K, Spurling, T & Webster, E 2014, *The role of science, research and technology in lifting Australian productivity. A report for the Australian Council of Learned Academies*, ACOLA, Melbourne, accessed from <<http://acola.org.au/index.php/australia-s-comparative-advantage-contributing-reports>>.
- Botterill, L & Chapman, B 2009, 'A Revenue Contingent Loan Instrument for Agricultural Credit, with particular reference to drought relief', *Australian Journal of Labour Economics*, vol. 12(2), pp.181–196.
- Braithwaite, J & Drahos, P 2000, *Global Business Regulation*, Cambridge University Press, Cambridge.
- BREE 2013, *Gas Market Report*, Bureau of Resources and Energy Economics, Canberra.
- Brown, AJ 2012, *Australian Constitutional Values Survey 2012*, Centre for Governance and Public Policy and Griffith Law School, Griffith University, Gold Coast.
- Butlin, NG 1964, *Investment in Australian Economic Development, 1861–1900*, Cambridge University Press, Cambridge.
- Cao, L, Hosking, A, Kouparitsas, M, Mullaly, D, Rimmer, X, Shi, Q, Stark, W & Wende, S 2015, 'The economy-wide efficiency and incidence of major Australian taxes', *Treasury Working Paper 2015–01*, Australian Treasury.
- Centre for Australian Foresight 2014, *Vision Australia: A Stocktake of Future Scenario Reports for Australia. A report for the Australian Council of Learned Academies*, ACOLA, Melbourne, accessed from <<http://acola.org.au/index.php/australia-s-comparative-advantage-contributing-reports>>.

- Cole, J 2014, 'The Historical Context of Australia's Federation', *A Federation for the 21st Century*, CEDA, Melbourne.
- Cornell University, INSEAD, & WIPO 2014, *The Global Innovation Index 2014: The Human Factor in Innovation*, Fountainbleau, Ithaca, and Geneva.
- Cox, G 2005, *Review of Creativity in Business: Building on the UK's Strengths*, UK Treasury <[http://webarchive.nationalarchives.gov.uk/+http://www.hm-treasury.gov.uk/coxreview\\_index.htm](http://webarchive.nationalarchives.gov.uk/+http://www.hm-treasury.gov.uk/coxreview_index.htm)>, accessed on 28 May 2015.
- Daley, J, McGannon, C & Ginnivan, L 2012, *Game-changers: Economic Reform Priorities for Australia*, Grattan Institute, Melbourne.
- Deloitte Access Economics 2013, *Investment and GDP profile study*, Business Council of Australia.
- Department of Industry 2014, *Annual Report 2013–14*, Australian Government, Canberra.
- Department of the Prime Minister and Cabinet 2014, 'Reform of the Federation: White Paper', *Issues Paper 1: A Federation for our Future*, Australian Government, Canberra.
- Department of the Treasury 2009, *Australia's Future Tax System Review, Report to the Treasurer*, Australian Government, Canberra.
- Department of the Treasury 2015, *Re:think—tax discussion paper*, Australian Government, Canberra.
- Drahos, P 2001, 'BITS and BIPS: Bilateralism in Intellectual Property', *The Journal of World Intellectual Property*, vol. 4(6), pp. 791–808.
- Economic Planning Advisory Commission 1995, *Private Infrastructure Task Force Report*, EPAC, Canberra.
- Ederer, P, Schuller, P, & Willms, S 2008, *University System Ranking: Citizens and Society in the Age of Knowledge*, The Lisbon Council, Brussels.
- Elnasri, A 2014, 'Efficiency of Infrastructure Provision: Australia, States and Territories', *Australian School of Business Research Paper No. 2014 ECON 25*, The University of New South Wales.
- Elnasri, A 2015, *Commissioned Statistical Studies for Australia's Comparative Advantage Project. A report for the Australian Council of Learned Academies*, ACOLA, Melbourne, accessed from <<http://acola.org.au/index.php/australia-s-comparative-advantage-contributing-reports>>.
- Enright, M & Petty, R 2013, *Australia's Competitiveness: from Lucky Country to Competitive Country*, Wiley, Singapore.
- Florida, R 2002, *The Rise of the Creative Class*, Basic Books, New York.
- Fraser Institute 2013, *Economic Freedom of the World: 2013 Annual Report*, Vancouver.
- Garnaut, R 2013, *Dog Days: Australia after China*, Black Inc, Melbourne 2013.
- Geoscience Australia 2014, *Australia's Identified Mineral Resources 2014*, Geoscience Australia, Canberra.
- Global Commission on the Economy and Climate 2015, *Seizing the Global Opportunity: Partnerships for a Better Growth and Better Climate, The 2015 New Climate Economy Report*, Washington and London, GCEC.
- Grattan Institute 2013, *Mapping Australian higher education*, Grattan Institute, Melbourne.
- Grattan, M 2015, 'Broad coalition formed to seek common ground on tackling climate change', *The Conversation*, 29 June.
- Gupta, N 2013, *Compendium of Reports for Australia's Comparative Advantage*, Australian Council of Learned Academies, Melbourne.
- Hajkowicz, SA, Cook, H & Littleboy, A 2012, *Our Future World: Global megatrends that will change the way we live*, CSIRO, Australia.
- Haltzman, E, Kerle, R & Lerner, A 2015, *Doing Business with Australia and Australian Organisations: A Global Perspective. A report for the Australian Council of Learned Academies*, ACOLA, Melbourne, accessed from <<http://acola.org.au/index.php/australia-s-comparative-advantage-contributing-reports>>.
- Hansard 2015, *Senate Economics References Committee*, Australian Parliament House, 9 April.
- Harper, I, Anderson, P, McClusky, S & O'Bryan, M 2015, *The Australian Government Competition Policy Review*, Australian Government, Canberra. <[http://competitionpolicyreview.gov.au/files/2015/03/Competition-policy-review-report\\_online.pdf](http://competitionpolicyreview.gov.au/files/2015/03/Competition-policy-review-report_online.pdf)>, accessed on 28 May 2015.
- Hausmann, R & Hidalgo, C et al. 2012, *The Atlas of Economic Complexity*, Puritan Press, Cambridge MA.
- Holzmann, R & Hinz, R 2005, *Old Age Income Support in the 21st Century: An International Perspective on Pension Systems and Reform*, The World Bank, Washington DC.
- Huntington, SP 1996, *The Clash of Civilizations and the Remaking of the World Order*, Simon & Schuster, New York.

- IBIS World 2013, *Oil and Gas Extraction in Australia*, IBIS World, Melbourne.
- IMD 2014, *IMD World Competitiveness Yearbook 2014*, IMD, Lausanne.
- Independent Economics 2015, *Australia's Comparative Advantage: Economic Scenarios. A report for the Australian Council of Learned Academies*, ACOLA, Melbourne, accessed from <<http://acola.org.au/index.php/australia-s-comparative-advantage-contributing-reports>>.
- Infrastructure Australia 2015, *Australian Infrastructure Audit*, Infrastructure Australia, Sydney.
- International Monetary Fund 2015, Australia: Concluding Statement of the 2015 Article IV Mission, IMF, Washington.
- Kanter, RM 2015, *Move: Putting America's Infrastructure Back in the Lead*, WW Norton & Company, New York.
- Keogh, M 2012, *Is Australia finally recognising that good agricultural land is a finite resource?*, 13 September, retrieved 11 April 2014, from Australian Farm Institute: <[http://www.farminstitute.org.au/\\_blog/Ag\\_Forum/post/Is\\_Australia\\_finally\\_recognising\\_that\\_good\\_agricultural\\_land\\_is\\_a\\_finite\\_resource](http://www.farminstitute.org.au/_blog/Ag_Forum/post/Is_Australia_finally_recognising_that_good_agricultural_land_is_a_finite_resource)>.
- Knight, M 2011, *Strategic Review of the Student Visa Program*, Australian Government, Canberra.
- KPMG Econtech 2010, *Economic Modelling of Improved Funding and Reform Arrangements for Universities*, Universities Australia.
- Kumar, S 2013a, *CEDA-ACOLA SAF01 Survey Analysis*, Australian Council of Learned Academies, Melbourne.
- Kumar, S 2013b, *Compendium of Global Ranking Reports*, Australian Council of Learned Academies, Melbourne.
- Kumar, S 2014, *IPAA-ACOLA Survey Report*, Australian Council of Learned Academies, Melbourne.
- Lowe, P 2013, *Investment and the Australian Economy*, Deputy Governor Reserve Bank of Australia Address to the CFA Australia Investment Conference, Melbourne, 24 October.
- Magee, GB 2000, *Knowledge Generation: Technological Change and Economic Growth in Colonial Australia*, Australian Scholarly Publishing, Melbourne.
- Mak, S 2014, 'The Constantly Changing Manufacturing Context', *Advanced Manufacturing: Beyond the Production Line*, CEDA, Melbourne.
- Marginson, S, Tytler, R, Freeman, B & Roberts, K 2013, *STEM: Country Comparisons*. Report for the Australian Council of Learned Academies, Melbourne <[www.acola.org.au](http://www.acola.org.au)>.
- Mason, L, Lederwasch, A, Daly, J, Prior, T, Buckley, A, Hoath, A, Giurco, D 2011, *Vision 2040: Mining, minerals and innovation—A vision for Australia's mineral future*, (prepared for CSIRO Minerals Down Under Flagship, Institute for Sustainable Futures) University of Technology, Sydney, and Curtin University.
- McGann, JG 2014, *2013 Global Go To Think Tank Index Report*, Think Tanks and Civil Societies Program, University of Pennsylvania, Philadelphia.
- McKinsey 2012, *Beyond the Boom: Australia's Productivity Imperative*, McKinsey Global Institute.
- Migration Council Australia 2015, *The Economic Impact of Migration*, Migration Council Australia.
- Minerals Council of Australia 2012, *Opportunity at risk: Regaining our competitive edge in minerals resources*, Minerals Council of Australia, Canberra, pp. 7.
- Moir, HVJ 2013, *Patent Policy and Innovation: Do Legal Rules Deliver Effective Economic Outcomes*, Elward Elgar, Cheltenham.
- National Intelligence Council 2012, *Global Trends 2030: Alternative Worlds*, Office of the Director of National Intelligence, United States.
- NATSEM 2012, *Smart Australians: Education and Innovation in Australia*, NATSEM, University of Canberra, Canberra.
- North, DC 1991, 'Institutions', *Journal of Economic Perspectives*, vol. 5(1), pp. 97–112.
- Nossal, K & Sheng, Y 2013, *Cross-country comparisons of agricultural productivity: An Australian perspective*, Rural Industries Research and Development Corporation, Canberra.
- Nye, JS 2004, *Soft Power: The Means to Success in World Politics*, Public Affairs, New York.
- O'Connor, J & Gibson M 2014, *Culture, Creativity, Cultural Economy: A Review. A report for the Australian Council of Learned Academies*, ACOLA, Melbourne, accessed from <<http://acola.org.au/index.php/australia-s-comparative-advantage-contributing-reports>>.
- OECD 2012, *OECD Economic Surveys: Australia 2012*, OECD Publishing.
- OECD 2013a, 'Producer support estimates (subsidies)', *Agriculture and Food: Key Tables*, OECD.
- OECD 2013b, *Health Data 2013—How does Australia Compare*, OECD.
- OECD 2014a, *Education at a Glance 2014*, OECD, Paris.
- OECD 2014b, *International Migration Outlook*, OECD, Paris.
- OECD 2014c, *Labour Force Statistics 2014*, OECD, Paris.
- OECD 2014d, *Revenue Statistics 2014*, OECD.
- OECD 2014e, *PISA 2012 Results in Focus: What 15-year-olds know and what they can do with what they know*, OECD, Paris.
- Olson, M 1982, *The Rise and Decline of Nations: Economic Growth, Stagflation and Social Rigidities*, Yale University Press, New Haven.
- Orica 2013, *Orica Annual Report 2013*, Orica Limited, Melbourne.
- Ostry, JD, Berg, A & Tsangarides, CG 2014, 'Redistribution, Inequality, and Growth', *IMF Staff Discussion Note # SDN/14/02*.
- Piketty, T 2014, *Capital in the 21st Century*, Harvard University Press, Cambridge MA.
- Podger, A 2008, 'Federalism Reform', *Public Administration Today*, Jan–Mar 2008.

- Pricewaterhouse Coopers 2014a, *Maintaining Australia's Mining Advantage*. A report for the Australian Council of Learned Academies, ACOLA, Melbourne, accessed from <<http://acola.org.au/index.php/australia-s-comparative-advantage-contributing-reports>>.
- Pricewaterhouse Coopers 2014b, *Maintaining Australia's Advantage: Institutions and Innovation*. A report for the Australian Council of Learned Academies, ACOLA, Melbourne, accessed from <<http://acola.org.au/index.php/australia-s-comparative-advantage-contributing-reports>>.
- Pricewaterhouse Coopers 2014c, *Maintaining Australia's Advantage: Management and Skills*. A report for the Australian Council of Learned Academies, ACOLA, Melbourne, accessed from <<http://acola.org.au/index.php/australia-s-comparative-advantage-contributing-reports>>.
- Productivity Commission 2014, 'Public Infrastructure', *Inquiry Report No. 71*, Canberra.
- Productivity Commission 2015, *Migrant Intake into Australia: Issues Paper*, Productivity Commission, Canberra.
- Rand Corporation 2015, *Implications of Australian Economic Growth for Social Equity. A report for the Australian Council of Learned Academies*, ACOLA, Melbourne, accessed from <<http://acola.org.au/index.php/australia-s-comparative-advantage-contributing-reports>>.
- Rand Corporation 2015, *Implications of Australian Economic Growth for Environmental Sustainability. A report for the Australian Council of Learned Academies*, ACOLA, Melbourne, accessed from <<http://acola.org.au/index.php/australia-s-comparative-advantage-contributing-reports>>.
- Roos, G 2014, 'The Constantly Changing Manufacturing Context', *Advanced Manufacturing: Beyond the Production Line*, CEDA, Melbourne.
- Roos, G & Kennedy, N (eds) 2015, *Global Perspectives on Achieving Success in High and Low Cost Operating Environments*, Hershey, PA, IGI Global.
- Samson, D & Gloet, M 2013, *Innovation: The New Imperative*, University of Melbourne and Australian Institute of Management, Melbourne.
- Sheng, Y, Mullen, J & Zhao, S 2011, *A turning point in agricultural productivity: consideration of the causes*, ABARES research report 11.4 for the Grains Research and Development Corporation, Canberra.
- Stiglitz, JE 2002, 'Information and the Change in the Paradigm in Economics', *American Economic Review*, vol. 92(3), pp. 460–501.
- The Canadian Chamber of Commerce 2013, *Mining Capital: How Canada has transformed its resource endowment into a global competitive advantage*, The Canadian Chamber of Commerce, Canada.
- The Social Research Centre 2015, *Australia's Comparative Advantage: Public Preference Study. A report for the Australian Council of Learned Academies*, ACOLA, Melbourne, accessed from <<http://acola.org.au/index.php/australia-s-comparative-advantage-contributing-reports>>.
- Tulloch, C, Jiang, T & Pearce, D 2014, *The impact of Free Trade Agreements on Australia*, publication no. 14/002, Rural Industries Research and Development Corporation, Canberra.
- Twomey, A & Withers, GA 2007, *Australia's Federal Future*, Council for the Australian Federation. <[www.caf.gov.au/Documents/AustraliasFederalFuture.pdf](http://www.caf.gov.au/Documents/AustraliasFederalFuture.pdf)>, accessed on 28 May 2015.
- USDA 2014, *Production, Supply and Distribution Online*, Foreign Agricultural Services, United States.
- Ville, S & Withers, GA (eds) 2015, *The Cambridge Economic History of Australia*, Cambridge University Press, Port Melbourne.
- Vulture Street Innovation 2014, *Australia's Comparative Advantage Challenge. A report for the Australian Council of Learned Academies*, ACOLA, Melbourne, accessed from <<http://acola.org.au/index.php/australia-s-comparative-advantage-contributing-reports>>.
- WEF 2014, *The Global Competitiveness Report 2013–14*, World Economic Forum.
- West, T & Worthington, A 2014, 'Australian Financial Risk Attitudes and Macro-economic Conditions, 2001–2010', *Journal of Family and Economic Issues*, vol. 35(2), June, pp. 263–277.
- Williams, J, Hook, RA & Hamblin, A 2002, *Argo-Ecological Regions of Australia: Methodologies for their derivation and key issues in resource management*, CSIRO Land and Water, Canberra.
- Williams, R, Leahy, A, Rassenfossé, G & Jensen, P 2015, *U21 Ranking of National Higher Education Systems*, University of Melbourne and Universitas 21, Melbourne.
- Withers, GA & Gupta, N 2013, 'Policy Innovation for Innovation: Income-contingent Loans', *Australia Adjusting: Optimising National Prosperity*, CEDA, Melbourne.
- World Economic Forum 2014, *Global Competitiveness Index 2014*, <[http://www3.weforum.org/docs/WEF\\_GlobalCompetitivenessReport\\_2014-15.pdf](http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2014-15.pdf)>, accessed on 28 May 2015.
- World Energy Council & Oliver Wyman 2015, *World Energy Trilemma: Priority Actions on Climate Change and How to Balance the Trilemma*, World Energy Council, London.
- Woyzbun, K, Beitz, S & Barnes, K 2014, 'Industry transformation', *Drivers of Change for the Australian Labour Market to 2030*, ASSA, Canberra.

# Expert Working Group

## **Professor Glenn Withers AO, FASSA (Chair)**

Glenn Withers is Professor of Economics at the Australian National University and President-Elect of the Academy of Social Sciences in Australia. He was previously founding Chief Executive Officer for Universities Australia and a Professor of Public Policy at the ANU. Glenn has served as a government, business and community sector adviser in Australia and overseas, and has chaired various public Inquiries and has headed bodies such as the Economic Planning Advisory Commission and the National Population Council. He has a Harvard PhD and was awarded an AO for his contribution to development of the Australian immigration points system.

## **Peter Laver AM, FTSE, HonFIEAust, FAusIMM (Deputy Chair)**

Currently is Senior Advisor at the Academy of Technology and Engineering (previously Vice President) and a Director of the Australian Centre for Innovation. Worked for 40 years with BHP in a variety of senior management positions covering steel, iron ore, transport, research, external affairs, safety and environment. Other positions held included Chancellor of Victoria University, Chair of the National Board of Employment, Education and Training, Chair Australian Building Codes Board, Chair Energy Research and Development Corporation, Chair Victorian Learning and Employment Skills Commission and Member CRC Committee.

## **Professor Graham Farquhar AO, FAA, FRS, NAS**

Distinguished Professor Graham Farquhar has undertaken and led research across a broad range of fields and scales, from integration of photosynthesis with nitrogen and water use of plants, stomatal physiology, isotopic composition of plants and global change. He is a fellow of The Australian Academy of Science and of the Royal Society and a Foreign Associate of the National Academy of Sciences. He has over 300 research publications and is a leading Australian Citation Laureate.

## **Professor Chris Gibson**

Chris Gibson is Professor of Human Geography and Director of the Global Challenges Program at the University of Wollongong. His research, supported by Australian Research Council grants and fellowships, explores human, cultural and economic assets in Australian cities and regions. He is currently editor of the scholarly journal, *Australian Geographer*.



## Associate Professor Sally Gras

Associate Professor Sally Gras is Director of the ARC Dairy Innovation Hub and Reader in the Department of Chemical and Biomolecular Engineering at the University of Melbourne. The ARC Dairy Innovation Hub is co-funded by the Australian Research Council, the University of Melbourne, the University of Queensland and industry partner Dairy Innovation Australia Ltd. (DIAL) and aims to address some of the major dairy research and technical challenges facing the Australian Dairy Manufacturing Industry. A. Prof Gras also leads a research group within the Bio21 Molecular Science and Biotechnology Institute that solves bioengineering problems. She trained as a Chemical Engineer and Molecular Biologist and received her PhD in protein biophysics from Cambridge University, UK.

## Professor Joseph Lo Bianco AM, FAHA

Dr Joseph Lo Bianco, AM, FAHA, FACE, is Professor of Language and Literacy Education at the University of Melbourne and Chief Investigator, Language, Education and Social Cohesion, Malaysia, Myanmar/Burma and Thailand. He is former president of the Australian Academy of the Humanities, Immediate Past and Inaugural President of the Tsinghua, Asia Pacific Forum on Translation and Intercultural Studies and research advisor for LUCIDE, an EC project on Languages in Urban Communities, documenting multilingualism at the municipal level in 12 European cities. Dr Lo Bianco has 130 publications on language, policy and planning, language education, literacy, culture and identity.

## Professor Rodney Maddock

Rodney Maddock is Vice Chancellor's Fellow at Victoria University, Adjunct Professor of Economics at Monash University, Profesor Vitalicia at the University of Antioquia, a Director of CEDA, and President of the Economic Society of Australia (Victoria). His previous roles included Head of Group Strategy for the CBA and Chief Economist at the Business Council of Australia. Rod's current research is mainly in banking and finance. Earlier research included books titled Unlocking the Infrastructure and Rational Expectations, edited volumes including The Australian Economy in the Long Run and many papers. His PhD is from Duke University. Rod is also a member of the National Economics Panel.

## Dr John Prescott AC, FTSE

Dr John B Prescott AC has substantial experience in major companies in resources, manufacturing and transport as an executive and director. He is currently Chairman of Aurizon Holdings Limited, a major transport company and a Member of the Commonwealth of Australia Remuneration Tribunal. He was a Managing Director and Chief Executive Officer of BHP, a director of Newmont Mining and Chairman of the ASC Pty Ltd (formerly the Australian Submarine Corporation). He has experience in managing safety, health, environment, human resources and industrial relations in heavy industries and executive management of major engineering projects, strategy development and staff support.

**All EWG members have declared any relevant interests.**



## Authors

### Dr Nitin Gupta

Nitin Gupta is Executive Manager of the Australia's Comparative Advantage project, and is currently a Visiting Fellow at the Regulatory Institutions Network at the Australian National University. Over the past 15 years, Nitin has gained varied work experience in academic, corporate, public and NGO sectors in Australia, India, US, and New Zealand. Nitin's doctoral research focused on evaluating the efficiency, employment, and technology impacts of India's post-reforms industrial performance. His other research has focused, among other things, on development economics, particularly the analysis of rural employment and of the coal industry in India.

### Lyndal Curtis

Lyndal Curtis is an award winning journalist who has covered federal politics for nearly 25 years for the ABC and commercial radio. She has served as Political Correspondent for ABC Radio News, Chief Political Correspondent for ABC Radio Current Affairs (AM, The World Today, & PM) and as Political Editor for ABC News24. She was also State Editor of the ACT ABC News.

She has covered a wide range of policy areas in her career including economics, taxation, industrial relations, foreign affairs, industry and agriculture policy as well as reporting on significant and history-making political events over the last two decades.

### Natalie Larkins

Natalie Larkins is a journalist with more than 20 years experience in the Australian media, primarily with the Australian Broadcasting Corporation where she reported, produced and presented radio and television news. Natalie is an experienced federal public servant who worked at a senior level at the Australian Taxation Office and the Department of Agriculture. As a public servant, Natalie provided strategic media and communications advice and issues management support to ministers, parliamentary secretaries and departmental executives. She has a strong interest in economics and public policy. Natalie has been a guest lecturer and tutor at the University of Canberra. She graduated from the Queensland University of Technology in 1996.

# Acknowledgements

The Expert Working Group is grateful to the experts who contributed to this project through participating in workshops and meetings. The names of those who contributed to formal workshops and Ideas Jam Challenge are listed under Evidence Gathering.

Further expert contributions were made through commissioned analysis. The resultant reports are also listed below under Evidence Gathering.

The Expert Working Group also thanks the project staff who supported the project—Dr Nitin Gupta, Ms Sunita Kumar, Dr Amani Elnasri and Mr Henry Wofford and colleagues in the ACOLA secretariat and the Office of the Chief Scientist.

The Expert Working Group also appreciated the contributions provided by Ms Lyndal Curtis and Ms Natalie Larkins with report drafting.

Components of the report were kindly reviewed by Professor Peter Drahos and Dr Hazel Moir and valuable advice was received from Professor Peter Whiteford, Professor Peter Warr, Dr Paul Burke, Professor Andrew Podger, The Hon. Professor Stephen Mering, Mr Terry Moran, Ms Sarah Jane Derby, Mr Nathan Taylor and Mr Andrew McCredie.

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The Expert Working Group also expresses its thanks for the contribution of the Project Steering Committee, ACOLA Council plus the four anonymous referees for comments and guidance on the project, as well as members of the Expert Working Group of other *Securing Australia's Future* projects.

# Evidence gathering

## 1. Workshop

As well as regular meetings and teleconferences for the project, the Expert Working Group held four major workshops to review project progress and examine major commissioned work for the project. The workshops were held in Melbourne on 30 November 2012, 21 August 2013, 6 August 2014 and 18 February 2015 and in addition to the members of the EWG the workshop benefitted from the involvement of the following persons in all or some of the workshops. The contribution of these experts is gratefully acknowledged.

Simon Prasad (OCS)

Jenny Allen (Treasury)

Tricia Brennan (DIISRTE)

Jacques de Vos Malan (ACOLA)

Rebecca Skinner (ACOLA)

Andrew Hastings (ATSE, SAF04 and SAF07)

Jerome Fahrner (ACIL Allen)

Jan Paul Van Moort (ACIL Allen)

Justin O'Connor (Monash University)

Mark Gibson (Monash University)

Peter Keogh (PwC)

Joanne Daly (CSIRO, SAF07)

Chris Murphy (Independent Economics)

Ralph Kerle (Ralph Kerle Foundation)

Navi Randhawa (ACOLA)

Nick Burger (RAND by phone from the US)

Amani Elnasri (UNSW)

## 2. Reports

The following consultancy reports were commissioned by the ACOLA Secretariat on behalf of the EWG for this project:

ACIL Allen Consulting, *Australia's Comparative Advantage in Agriculture*

ACIL Allen Consulting, *Australia's Comparative Advantage in Services*

CEDA, *Survey of CEDA Members for ACOLA Project*

Elnasri, A, *Commissioned Statistical Studies for Australia's Comparative Advantage Project*

Eventures Australia, *Doing Business with Australia and Australian Organisations: A Global Perspective on Australia's Innovation and Entrepreneurship Capability*

Independent Economics, *Australia's Comparative Advantage: Scenario Modelling*

IPAA, *Survey of IPAA Members for ACOLA Project*

Justin O'Connor and Mark Gibson, Monash University, *Culture, Creativity, Cultural Economy: A Review*

PwC, *Maintaining Australia's Advantage: Institutions and Innovation*

PwC, *Maintaining Australia's Advantage: Management and Skills*

PwC, *Maintaining Australia's Mining Advantage*

Rand Corporation (Australia), *Australia's Comparative Advantage: Implications of Australian Economic Growth for Environmental Sustainability*

Rand Corporation (Australia), *Australia's Comparative Advantage: Implications of Australian Economic Growth for Social Equity*  
 SAF01, *Compendium of Global Ranking Reports*  
 SAF01, *Compendium of National Reports for Australia's Comparative Advantage*  
 Social Research Centre, *Australia's Comparative Advantage: Public Preference Study*  
 Centre for Australian Foresight, *Vision Australia, A Stocktake of Future Scenario Reports for Australia*  
 Vulture Street, *Ideas Jam Challenge: Report*

All reports are to be made available online at <<http://acola.org.au/index.php/saf01-contributing-reports>>.

### 3. Ideas Jam Challenge

The following were the participants in the Ideas Jam as reported in Chapter 2 of this report.

Kirill Alexandrov	Nicole Bell	John Day	Helen Groth
Ian Ang	Hugh Bradlow	Jacques de Vos Malan	Ian Gust
Nicholas Aroney	Jenny Brands	Greig de Zubicaray	Vedi Hadiz
Irina Baetu	David Brockway	Cathie Doherty	Gustaaf Hallegraeff
Rowena Ball	Thomas Brodnicki	Kejun Dong	Anthony Hannan
Crystal Ball	Leeanne Carey	Sue Donymme	Margaret Hartley
Kirrie Ballard	John Carter	Paul Douglas	Erol Harvey
Fiona Kate Barlow	nicolas cherbuin	Stephen Duckett	Bronwyn Hemsley
Amanda Barnier	David Christian	Jhodie Duncan	Beryl Hesketh
Selena Bartlett	Adrienne Clarke	Hazel Easthope	Michelle Hill
Kaye Basford	Vicki Clifton	Norman Etherington	Andy Hill
Fran Baum	Ben Corry	Krystal Evans	Rod Hill
Louise Baur	Roland Crocker	Marguerite Evans-Galea	Cameron Holley
Gareth Baynam	Lucette Cysique	Kathryn Fagg	RM Damian Holsinger
David Beanland	David Day	Lindsay Falvey	Robert Holton
		Chris Fell	Cliff Hooker
		Marco Fiorentini	Michael Hubbard
		Gary Fitt	Jennie Hudson
		Neville Fletcher	Dietmar Werner
		Anne Fletcher	Hutmacher
		John Floyd	George Jackson
		Simon Foote	Keith Jacobs
		Majella Franzmann	Roger James
		Bob Frater	Jonine Jancey
		Ian Frazer	Jane Jane
		Kenneth Freeman	Martyn Jeggo
		Sam Gandy	Anna Johnston
		Jillian Garvey	Ron Johnston
		Stathis Gauntlett	Yogesana Kanagasingam
		Kath Gelber	Salit Kark
		Adrian Gibbs	Margaret Kay
		Philip Gillingham	Ivan Kempson
		Stephanie Godfrey	Jee Hyun Kim
		Catherine Gomes	Robin King
		Alexander Gosling	Matt King
		John Grace	David Konstan
		Andy Green	Sunita Kumar
		Charlotte Greenhalgh	Kurt Lambeck
			Peter Laver

Max Lay	Wendy Moyle	Judith Sass	Pall Thordarson
Hong Lee	Jochen Mueller	Peter Schofield	John Toomey
Michael Lerch	J Mylne	Marine Scientist	David Topping
Shaomin Liu	Ben Newell	Karim Seghouane	Dennis Trewin
Geraldo Lorenzi-Filho	John O'Connor	Marie Segrave	Cassandra Troy
Dusan Losic	Ron Observer	Frances Separovic	Tim Trudgian
Gary Luck	S Park	Stas Shabala	Rod Tucker
Andre Luiten	Ekaterina Pas	Paul Sidwell	Christina Twomey
David Lupton	John Passioura	Robert Sinnerbrink	Sean Ulm
Dean Lusher	Adi Paterson	Rebecca Skinner	Krasimir Vasilev
Alban Lynch	Alana Petersen	Jill Slay	Geoff Vaughan
Sarah Maddison	Sandra Piazzolo	Yorick Smaal	Vlado Vivoda
LJ Marcus	Sabrina Pit	Andrew Smith	Hongxia wang
Fernando Martin-Sanchez	Pierre Portal	Kelly Smith	Sally Weller
Freya Mathews	Hugh Possingham	Peta Smith	Xi Wen
Oliver Mayo	Trevor Powell	Bob Smith	Andrew White
Clive McAlpine	Cheryl Praeger	John Soderbaum	Claire White
Ross McAree	Steven Prawer	Ron Spithill	John White
Tara McGee	Hamsa Puthalakath	Kate Stacey	Glenn Wightwick
Andrew McNamara	Peter Quinn	Martin Steinbauer	Nick Wong
Peter McPhee	Tapabrata Ray	Grant Steven	John Wright
Felicity Meakins	Stephen Redmond	Julie Stragalinis	Ian Wright
Richard Menary	Mark Reid	Nathan Subramaniam	Jerome Wu
Rich Mildren	Peter Researcher	Dan Svantesson	Hsin-Hao Yu
Michael Milford	A Rich	John Tang	John Zalcberg
Maria Miranda	John Roberts	Nic Taylor	Rui Zhang
Gabriel Molina Terriza	Ute Roessner	Geoffrey Taylor	George Zhao
Louise Mond	Wendy Rogers	Tai Thai	Sanming Zhou
Tanya Monro	Nedeljka Rosic	Rhea Themis	Mel Ziman
Kaye Morgan	Ivan Rukhlenko	Emma Thomas	Ionat Zurr
Scott Morrison	Sarah Russell	Ross Thompson	David Zyngier
Steve Most	Perminder Sachdev		

In addition to the participants listed, 25 people participated anonymously or under pseudonyms.

# Review Panel

This report has been reviewed by an independent panel of experts. Members of this Review Panel were not asked to endorse the Report's conclusions and findings. The Review Panel members acted in a personal, not organisational, capacity and were asked to declare any conflicts of interest. ACOLA gratefully acknowledges their contribution.

## Michael Small

Michael Small was Canada's High Commissioner to Australia from September 2010 until December 2014. Before his posting to Australia, he served in Ottawa in the headquarters of the Department of Foreign Affairs and International Trade as Assistant Deputy Minister, Global Issues and then Assistant Deputy Minister, Human Resources. He served as Canada's Ambassador to Cuba from 2000–03 and earlier in his diplomatic career, was posted to Mexico, Costa Rica, Brazil and Malaysia. Since January 2015, he has taken up a position in Vancouver as Executive Director of Renewable Cities, a program of Simon Fraser University's Centre for Dialogue.

## Professor Göran Roos

Göran Roos is a fellow of the Australian Academy of Technological Sciences and Engineering as well as of the Royal Swedish Academy of Engineering Sciences (IVA). He is a member of the Council for Flinders University and also a Stretton Fellow appointed by the City of Playford at University of Adelaide; Adjunct Professor at ECIC, University of Adelaide; Adjunct Professor at University of Technology Sydney Business School; and Adjunct Associate Professor in the College of Business, Nanyang Business School, Nanyang Technological University, Singapore. He is also chairing the Value Add and Industrial Growth Sub-Committee of the Economic Development Board in Adelaide.





# About Securing Australia's Future

In June 2012 the Australian Government announced *Securing Australia's Future*, a \$10 million investment funded by the Australian Research Council in a series of strategic research projects. Projects are delivered to the Commonwealth Science Council by the Australian Council of Learned Academies (ACOLA) via the Office of the Chief Scientist and the Australian Chief Scientist.

*Securing Australia's Future* is a response to global and national changes and the opportunities and challenges of an economy in transition. Productivity and economic growth will result from: an increased understanding in how to best stimulate and support creativity, innovation and adaptability; an education system that values the pursuit of knowledge across all domains, including science, technology, engineering and mathematics; and an increased willingness to support change through effective risk management.

Six initial research topics were identified:

- i. Australia's comparative advantage
- ii. STEM: Country comparisons
- iii. Smart engagement with Asia: Leveraging language, research and culture
- iv. The role of science, research and technology in lifting Australian productivity
- v. New technologies and their role in our security, cultural, democratic, social and economic systems
- vi. Engineering energy: unconventional gas production

Two further research topics have been identified:

- vii. Australia's agricultural future
- viii. Sustainable urban mobility

The Program Steering Committee responsible for the overall quality of the program, including selection of the Expert Working Groups and the peer review process, is comprised of three Fellows from each of the four Learned Academies:

Professor Michael Barber FAA FTSE  
(Chair)

Mr Dennis Trewin AO FASSA  
(Deputy Chair—Research)

Professor James Angus AO FAA

Dr John Burgess FTSE

Professor Bruce Chapman AO FASSA

Professor Ruth Fincher FASSA

Professor Paul Greenfield AO FTSE

Professor Lesley Head FAHA

Professor Peter McPhee AM FAHA FASSA

Professor Stephen Powles FAA FTSE

Dr Susan Pond AM FTSE

Professor Graeme Turner FAHA

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