Australian Government

Department of Jobs and Small Business

Submission to the Senate Select Committee on the Future of Work and Workers

January 2018

Contents

1. Introduction

The Department of Jobs and Small Business (the Department) welcomes the opportunity to make a submission to the Senate Select Committee on the Future of Work and Workers inquiry into the impact of technological and other change on the future of work and workers in Australia.

Australia's labour market has been shaped by significant technological and other changes over the last half century. This includes globalisation, demographic shifts, and unprecedented technological advances in communications and transportation. These and other influences have affected the industrial makeup of our economy and the nature of our workforce.

In this submission, the Department comments on the possible impact of a new wave of technological progress on the labour market, including developments in automated technologies and the emergence of digital platforms. We also outline industry employment projections for the next five years, including a focus on regional Australia, as well as what key international institutions are doing on the future of work.

2. Automation and the future of work

Economists in many advanced economies are currently debating the impact of automation technologies on the future of work. Some believe that recent breakthroughs in artificial intelligence and dexterous, adaptive, robotics may eliminate jobs on an alarming scale, potentially leading to rising unemployment and widening inequality. Others, including some leading Australian economists, argue there is little evidence to support these predictions, and say history shows technology has always created more work than it has displaced.

A brief summary of the debate

Carl Frey and Michael Osborne of Oxford University published a widely cited study on the vulnerability of jobs to automation in 2013.[1] The authors ignited contemporary anxieties about technology-induced unemployment when they examined the probability of computerisation of 702 occupations and found 47 per cent of workers in the United States were in jobs at high risk of being automated within 10 to 20 years. Workers most likely to be 'substituted by computer capital', according to Frey and Osborne, include those in transportation and logistics occupations, as well as workers in office and administrative support.

Top and bottom 20 occupations by automation susceptiblity, 2014

20 highest automation scores		*20 lowest automation scores*	
Occupation	*Automation score*	*Occupation*	*Automation score*
Telemarketers	99.0	Dietitians	0.4
Bank workers	97.8	Hotel managers	0.4
Bookkeepers	97.7	Education advisers	0.4
Accounting clerks	97.2	Psychologists	0.5
Product quality	97.0	Dental practitioners	0.5
Payroll clerks	97.0	Speech professionals	0.6
Checkout operators	96.9	Education managers	0.7
Other clerical workers	96.7	School principals	0.7
Insurance investigators	96.6	ICT business analysts	0.7
Library assistants	96.3	Secondary teachers	0.8
Other sales assistants	96.2	Podiatrists	0.8
Switchboard operators	96.1	Occupational therapists	0.8
General clerks	96.0	Chiropractors	0.8
Inquiry clerks	95.9	Special educ. teachers	1.1
Secretaries	95.4	Agricultural scientists	1.1
Product assemblers	95.2	Pharmacists	1.2
Keyboard operators	95.1	Ministers of religion	1.3
Jewellers	95.0	ICT trainers	1.4
Debt collectors	95.0	Training professionals	1.4
Garden labourers	95.0	Office managers	1.4

Source: Department of Industry, Innovation and Science

Two Australians studies in 2015 used similar methodology. The first, published by the Committee for the Economic Development of Australia (CEDA), reported that 40 per cent of jobs would be lost to computerisation and automation in the next 10 to 15 years.[2] In the second study, the Office of the Chief Economist at the Department of Industry, Innovation and Science found 44 per cent of jobs were at risk.[3]

In contrast, two more recent studies have more conservative conclusions. In 2016, the Organisation for Economic Co-operation and Development (OECD) examined data from its 21 member countries and found that, on average, just nine per cent of jobs were are at risk of being automated (including nine per cent in the United States, compared with 47 per cent in the Frey and Osborne study).[4] Differing methodology explains this more modest outlook. Unlike the OECD, Frey and Osborne assumed advances in technology would replace entire occupations, rather than some of the tasks performed in those occupations. Another study by economists at the University of Melbourne took a similar 'task-based' approach and also found that approximately nine per cent of Australian workers are at high risk of their jobs being automated.[5]

[1] Carl Frey and Michael Osborne, *The Future of Employment: How Susceptible are Jobs to Computerisation?*, Oxford Martin School, University of Oxford, September 2013.

[2] Hugh Durrant-Whyte et al, 'The impact of computerisation and automation on future employment', *Australia's Future Workforce?*, Committee for the Economic Development of Australia (CEDA), June 2015.

[3] Daniel Edmonds and Timothy Bradley, 'Mechanical boon: will automation advance Australia?', *Research Paper 7/2015*, Office of the Chief Economist, Department of Industry, Innovation and Science, October 2015.

[4] Melanie Arntz, Terry Gregory and Ulrich Zierahn, 'The Risk of Automation for Jobs in OECD Countries: A Comparative Analysis', *OECD Social, Employment and Migration Working Papers No 189*, June 2016.

[5] Jeff Borland and Michael Coelli, 'Are Robots Stealing Our Jobs?', *The Australian Economic Review*, volume 50, number 4, December 2017.

Reasons to be cautious about predictions of mass unemployment

History may be a lesson

Throughout history, periods of transformative technological change have always caused anxiety about the ongoing utility of human labour. As *The Economist* noted, these concerns go as far back as two centuries ago when Britain was industrialising. While we now call this period the industrial revolution, at the time there was only talk of the 'machinery question'. According to economist David Ricardo in 1821, the question concerned the 'influence of machinery on the interests of the different classes of society' and in particular the 'opinion entertained by the labouring class, that the employment of machinery is frequently detrimental to their interests'.[6]

More than 100 years later, during a period of innovations such as electricity and the telephone, English economist John Maynard Keynes warned of a 'new disease' of 'technological unemployment'.[7] As factories were introducing machines in the 1960s, United States President John F Kennedy declared the major challenge of the decade was to 'maintain full employment at time when automation…is replacing men'.[8] Similar anxieties occurred in the 1980s with the advent of personal computers.

While technology has displaced many jobs in the past, predictions of mass unemployment have never eventuated. This is because productivity growth associated with technological innovation has always created more jobs than it has displaced. According to research by economists David Autor of the Massachusetts Institute of Technology and Anna Salomons of the Utrecht University School of Economics, where jobs have been displaced by new technologies, efficiency gains—such as lower prices for consumers and higher wages for the remaining workers—have generated demand and employment in new industries.[9] History has also shown that automation redefines some jobs, rather than eliminating them. The introduction of automated teller machines (ATMs), for example, meant bank employees were required to undertake new, less routine tasks, such as providing customer service.

As the Productivity Commission noted in its recent productivity review:

> Effective labour markets do not stand still. Occupations, skills and jobs come … and they go. More than a century ago, lamplighters, icemen, and telegraph operators fell into decline. In the middle of the last century, dunny men and bread delivery vans became a less familiar sight on our streets. Towards the end of the century, switchboard operators, typists and TV repairmen became rarer and rarer. Travel agents, bank tellers and supermarket cashiers still exist as occupations, but opportunities in these occupations are diminishing. The falling cost of technology relative to wages was in part responsible for these shifts, while for others, new services simply superseded old ways of delivery.
>
> No matter how transformative the telephone, electricity, indoor plumbing, refrigeration or personal computing have been (and in productivity terms, all have been more transformative than the digital revolution, so far) no technology (nor aggregation of them) has succeeded in removing people's capacity and desire to work. In fact, history has shown that over the long run, technology has been a friend to many employees, removing jobs that are often unpleasant, physically tiring, dangerous or tedious. Overall employment persistently grew despite these fundamental technology changes, as did wage rates.[10]

[6] Tom Standage, 'The return of the machinery question', *The Economist*, 25 June 2016.

[7] John Maynard Keynes, *Economic Possibilities for Our Grandchildren*, 1930.

[8] Tom Standage, above n 6.

[9] David Autor and Anna Salomons, 'Robocalypse Now—Does Productivity Growth Threaten Employment?', European Central Bank Annual Conference, Sintra, Portugal, 27 June 2017, p 5.

[10] Productivity Commission, 'Digital Disruption: What do governments need to do?', *Research Paper*, June 2016, p 87.

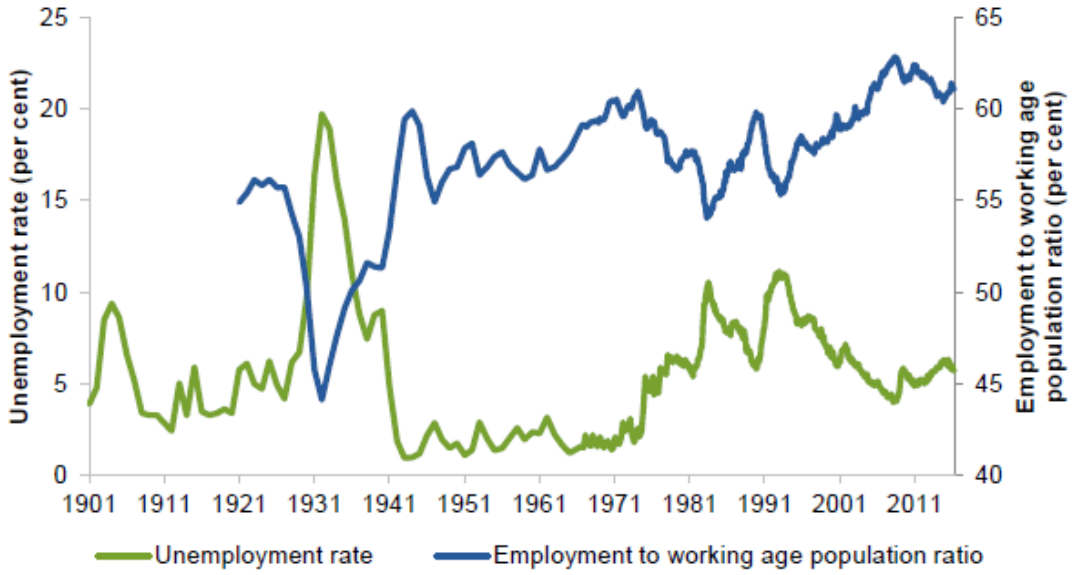
There are limits to what we can automate

Just because it is feasible to automate a job or task does not mean it will be automated. Sometimes the cost of doing so, relative to wages, may be prohibitive. Jobs that remain difficult, and costly, to automate include those involving social interaction (such as child and aged care) or creative intelligence (such as architecture), and occupations that are highly unpredictable (such as plumbing and gardening).

There is no evidence that technology is displacing work in Australia

Recent research by economists Jeff Borland and Michael Coelli of the University of Melbourne, found no evidence of an accelerating effect of technological change on the Australian labour market.[11] Despite significant increases in the use of computer-based technologies over the decades, the aggregate hours worked in Australia have not decreased and the pace of change and job turnover in the labour market has not accelerated. In addition, according to the Productivity Commission, Australia's employment to population ratio has not declined, nor has the unemployment rate trended upwards, despite the automation of many tasks over a long period of time.[12]

Employment to population ratio and unemployment rate, 1901–2016



Source: Productivity Commission (2016)

[11] Jeff Borland and Michael Coelli, above n 5.

[12] Productivity Commission, above n 10.

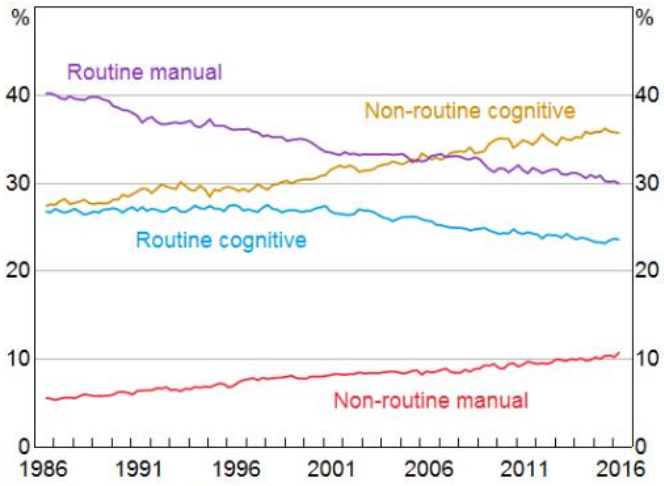
Automation will continue to change the nature of work

Despite the debate and uncertainty about the scale and type of impact automation will have on employment, there is little doubt among economists that automation will continue to change the nature of work. Dr Alexandra Heath, head of economic analysis at the Reserve Bank of Australia, found a noticeable decline in the share of people in Australia employed in routine manual jobs over recent decades (see chart). This can be explained, at least in part, by advances in automation technologies.[13]

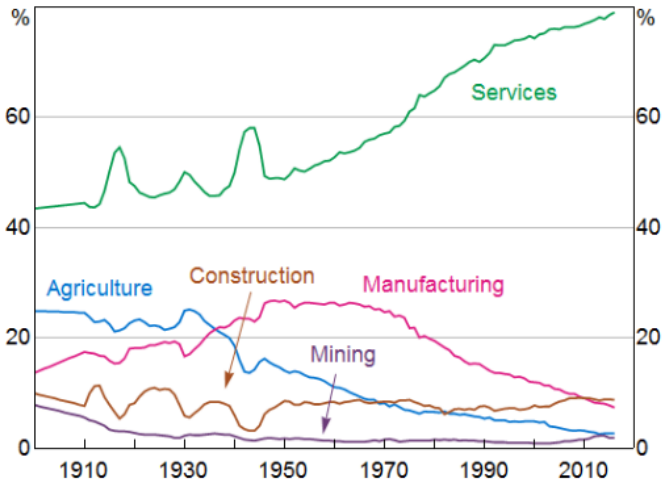
Since the early 2000s, there has also been a steady decline in the proportion of people working in routine cognitive employment, such as bookkeeping and clerical work. One explanation for this, according to Dr Heath, is that the information technology (IT) revolution of the 1960s and 1970s exposed a new category of job to the possibility of automation. Technology has also made it possible for some routine cognitive jobs, such as those in call centres, to be done in other parts of the world where labour costs are lower.

In contrast to the decline of routine work, non-routine manual and non-routine cognitive employment in Australia has steadily grown. These jobs are less susceptible to automation because they may require creativity, managerial experience or a human presence. The fastest growing non-routine jobs are in the services industries (see chart), in particular in the health care and social assistance sector.

Employment by skill type, per cent of total



Employment by industry, share of total



* Data are interpolated between 1900 and 1910

Source: Heath (2016)

The changing skills distribution in the labour market is sometimes described as 'job polarisation', where the share of middle-skilled jobs (such as those in manufacturing) are declining compared with increases in the share of low-skilled and high-skilled jobs. There are concerns that a continuation of this trend, which has occurred in many advanced economies, will result in a 'hollowing out' of the middle class. However, research by Jeff Borland and Michael Coelli, found such jobs polarisation in Australia primarily occurred in the 1980s and 1990s.[14]

[13] Alexandra Heath, 'The Changing Nature of the Australian Workforce', speech to a CEDA Conference, Brisbane, 21 September 2016.
[14] Jeff Borland and Michael Coelli, 'Job polarisation and earnings inequality in Australia', *Economic Record*, volume 92, issue 92, 2016.

3. Work in the digital economy

Advances in internet and mobile technologies, including the GPS-enabled smartphone, have improved the ways consumers and services are matched. Many Australians, for example, now use mobile apps for on-demand services, such as transportation or food delivery. These developments are often referred to as the 'gig economy', where jobs are broken down into short-term tasks or 'gigs' and generally undertaken by self-employed independent contractors.

Defining and measuring the gig economy

There is no universally accepted definition of the gig economy, but it broadly describes a sector in which digital platforms facilitate transactions between buyers and sellers for a fee. Some facilitate the engagement of temporary self-employed labour (such as Airtasker) or the short-term rental of assets (such as Airbnb). A broader definition may also include platforms for selling goods (such as Ebay).

There is limited reliable data on the number of people using digital platforms to work or otherwise earn money in many countries. This is mainly because the gig economy remains ill-defined and does not fit easily into official labour statistics.

Government agencies in the United States have taken steps recently to better define and measure the gig economy. In June 2016, the United States Department of Commerce proposed a new definition for digital platforms, which it calls 'digital matching services'. These services are defined as those that (1) facilitate peer-to-peer transactions using digital platforms or mobile apps, (2) use user-based rating systems, (3) offer workers flexibility in determining their hours, and (4) place responsibility on workers to provide whatever tools or assets are necessary to accomplish their work.[15] In May 2017, the United States Bureau of Labour Statistics conducted an updated labour market survey which included questions designed to capture work in the gig economy, the results of which will be released in early 2018.[16]

Despite the limitations, the available data suggests the gig economy has not changed the shape of the Australian labour market. Self-employed independent contractors make up less than nine per cent of the workforce in Australia, a figure that has not significantly changed for many years (see chart on the following page). Independent researchers also suggest the number of workers in the gig economy is very small. In September 2017, Australia's peak superannuation body, the Association of Superannuation Funds of Australia, estimated approximately 100,000 people (or 0.8 per cent of the workforce) use digital platforms to obtain work on a regular basis.[17] This appears consistent with earlier research in the United States, which found 0.5 per cent of workers in that country worked though digital platforms in late 2015.[18]

However, surveys in other countries detect a larger gig workforce. In the United Kingdom, for example, research to inform a government-commissioned review into modern working practices found approximately four per cent of the workforce participated in the gig economy in December 2016.[19] A high proportion of

[15] Rudy Teles, *Digital Matching Firms: A New Definition in the "Sharing Economy" Space*, United States Department of Commerce, Economics and Statistics Administration, Office of the Chief Economist, June 2016.

[16] Michael Horrigan, 'Measuring the "Gig" economy', United States Bureau of Labour Statistics, presentation to meeting of Group of Experts on Measuring Quality of Employment, October 2017.

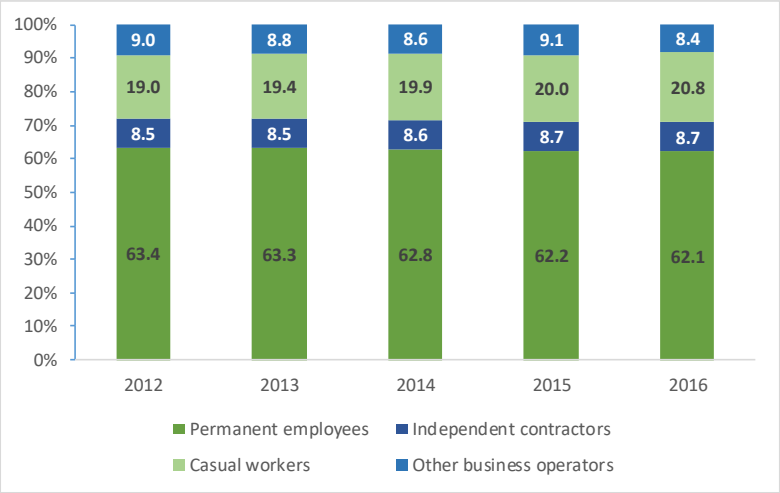
[17] Andrew Craston, *Superannuation and the Changing Nature of Work: Discussion paper*, Association of Superannuation Funds of Australia, September 2017.

[18] Lawrence Katz and Alan Krueger, *The rise and nature of alternative work arrangements in the United States, 1995–2015*, March 2016.

[19] Matthew Taylor, *Good work: the Taylor review of modern working practices*, United Kingdom Department for Business, Energy and Industrial Strategy, July 2017, p 25.

these workers (58 per cent) were permanent employees, reflecting earlier research in the United States that found people often supplement their income through the gig economy.[20]

Stability in the forms of work in Australia, 2012–2016



Sources: Australian Bureau of Statistics (ABS) 2014, Forms of Employment, Australia, November 2013, Cat. No. 6359, released May 7, 2014; ABS 2016, Characteristics of Employment, Australia, August 2016, Cat. No. 6333, released May 22, 2017

Opportunities and challenges

Although still in its infancy, the gig economy's potential growth presents both opportunities and challenges. According to the Productivity Commission, opportunities include potential improvements in productivity by allowing businesses to more accurately match and scale resources to their needs.[21] People can also benefit, as digital platforms offer flexibility of when and how many hours to work, as well as a means of earning additional income. According to the Grattan Institute, there is evidence digital platforms are boosting employment and income for those on the 'fringe' of the labour market (such as those who are unemployed or underemployed due to age or ill-health), and putting to use many unused homes and other assets.[22]

However, there are also challenges. Many people value the security of traditional employer-employee arrangements over the flexible and short-term nature of 'gig work'. There is also uncertainty about the legal status of some workers in the gig economy (both in Australia and overseas), most of whom are classified by digital platforms as independent contractors rather than employees. The distinction is important because employees receive entitlements and protections that independent contractors do not. In Australia, these include the minimum wage, paid leave (or a loading to compensate for the lack of paid leave if they are a casual employee) and compulsory superannuation contributions (provided that they earn more than $450 per month).

Some working arrangements in the gig economy may constitute 'sham contracting', the practice of misclassifying employees as independent contractors. Some employers deliberately use sham contracting to avoid paying employee entitlements, however, this is unlawful under the *Fair Work Act 2009* and the Fair Work Ombudsman will address instances of sham contracting when they are brought to its attention.

[20] McKinsey Global Institute, *Independent Work: Choice, Necessity, and the Gig Economy*, October 2016, p 32.

[21] Productivity Commission, above n 10, p 76.

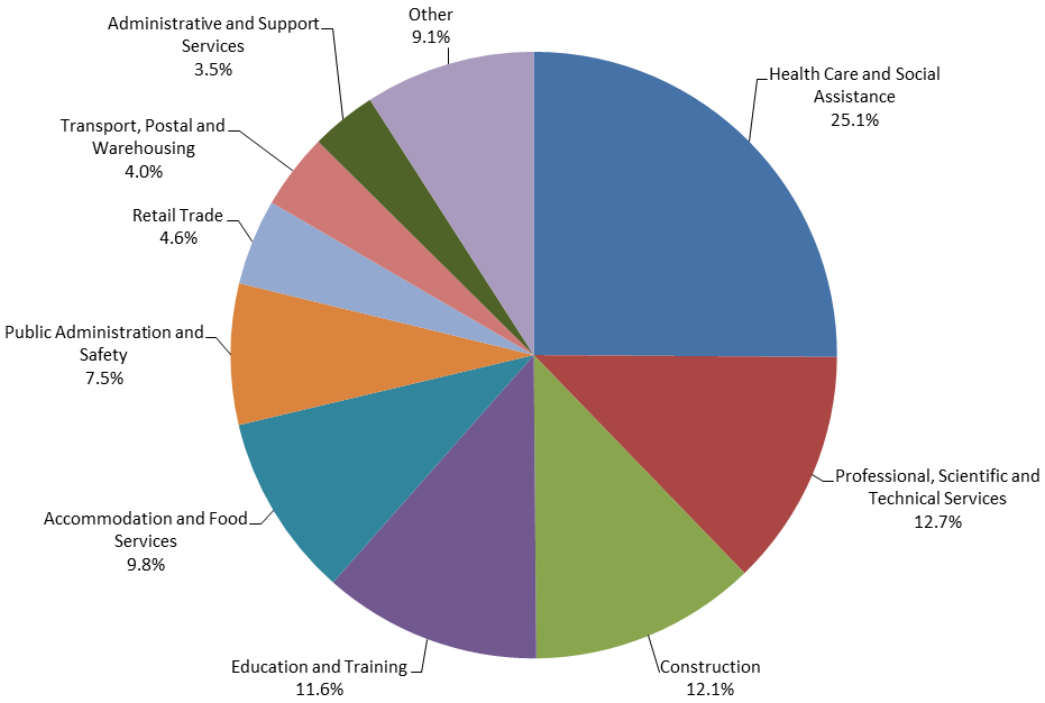
[22] Jim Minifie, 'Peer-to-peer pressure: Policy for the sharing economy', Grattan Institute, April 2016, p 1.

4. The employment outlook for the next five years

The Department projects total employment in Australia will increase by 948,400 (or 7.8 per cent) over the five years to May 2022. The projections are based on June 2017 Labour Force Survey (LFS) data for total employment, as well as May 2017 LFS industry employment data (latest available) and the forecasted and projected total employment growth rates published in the 2017–18 Budget. The Department projects:

- Employment will increase in 16 of the 19 broad industries over the five years to May 2022, but will decline in **Manufacturing; Electricity, Gas, Water and Waste Services; and Agriculture, Forestry and Fishing**
- The long-term structural shift in employment towards services industries will continue over the coming five years. **Health Care and Social Assistance** is projected to make the largest contribution to employment growth (increasing by 250,500), followed by **Professional, Scientific and Technical Services** (126,400), **Construction** (120,700) and **Education and Training** (116,200). Together, these four industries are projected to provide 61.5 per cent of total employment growth over the five years to May 2022.

Share of projected employment growth, by industry, five years to May 2022



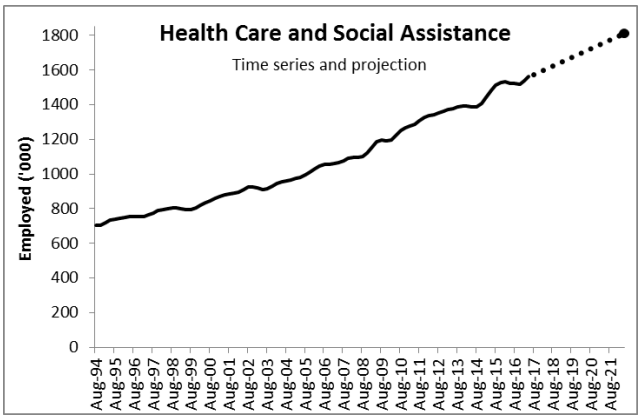
Note: 'Other' consists of: Financial and Insurance Services; Arts and Recreation Services; Rental, Hiring and Real Estate Services; Other Services; Information Media and Telecommunications; Mining; and Wholesale Trade. Agriculture, Forestry and Fishing; Electricity, Gas, Water and Waste Services; and Manufacturing are excluded from the chart as they are not projected to grow over the five years to May 2022.

Industry projections—five years to May 2022

Industry	Projected employment growth – five years to May 2022	
	('000)	(%)
Agriculture, Forestry and Fishing	-2.4	-0.8
Mining	5.6	2.4
Manufacturing	-38.3	-4.2
Electricity, Gas, Water and Waste Services	-9.0	-7.0
Construction	120.7	10.9
Wholesale Trade	1.9	0.5
Retail Trade	45.6	3.7
Accommodation and Food Services	97.6	11.2
Transport, Postal and Warehousing	40.3	6.5
Information Media and Telecommunications	6.9	3.3
Financial and Insurance Services	24.6	5.6
Rental, Hiring and Real Estate Services	18.0	8.5
Professional, Scientific and Technical Services	126.4	12.5
Administrative and Support Services	34.9	8.4
Public Administration and Safety	75.0	9.3
Education and Training	116.2	12.0
Health Care and Social Assistance	250.5	16.1
Arts and Recreation Services	21.4	9.9
Other Services	12.3	2.5
All Industries	**948.4**	**7.8**

Selected industry commentary

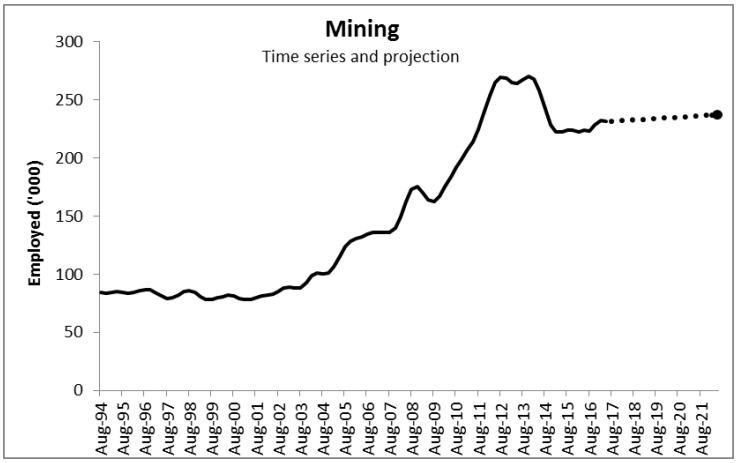
- **Health Care and Social Assistance** has been the primary provider of new jobs in the Australian labour market since the 1990s, and this is expected to continue. Over the next five years, employment in this industry is projected to increase by 250,500 (or 16.1 per cent). Factors contributing to this strong projected growth include the full implementation of the National Disability Insurance Scheme (scheduled for 2019–20), Australia's ageing population, and increasing demand for child care and home-based care services.



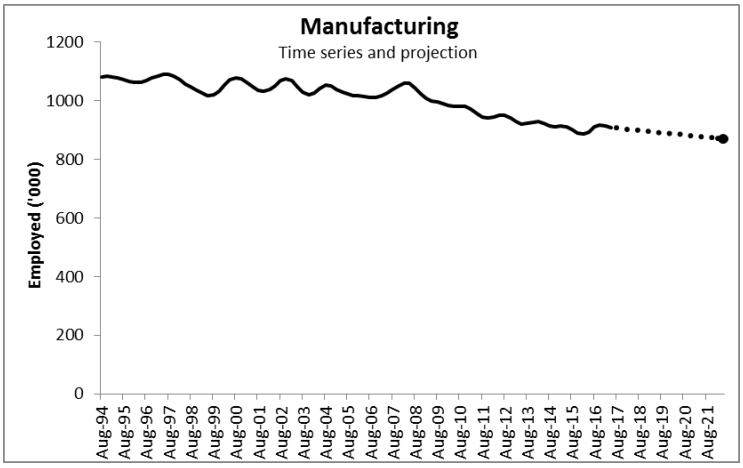
- Employment in **Professional, Scientific and Technical Services** is projected to increase by 126,400 (or 12.5 per cent) over the five years to May 2022, the second largest increase of any industry. The projected high rate of employment growth in the industry reflects ongoing strength in demand for the services of qualified and highly educated workers throughout the economy.
    - Employment is expected to grow particularly strongly in the Computer System Design and Related Services sector, which is projected to grow by 54,200 (or 24.6 per cent) after having grown by 83.9 per cent over the past 10 years to its current employment level of 220,200.
    - Employment growth in Architectural, Engineering and Technical Services and Legal and Accounting Services is expected to moderate compared with the past five years. However, these sectors are still expected to make major contributions to the industry's employment growth, with employment projected to grow by 26,600 in the Architectural, Engineering and Technical Services sector and by 18,500 in the Legal and Accounting Services sector. Trade-exposed firms are expected to be favoured by the Australian dollar remaining at levels similar to 2016.
- **Construction** industry employment is projected to grow by 120,700 (or 10.9 per cent) over the five years to May 2022. Residential Construction employment is expected to grow at a slower pace than it has during the past five years, and be more in line with population growth. Significant infrastructure investment is expected to underpin employment growth in the Engineering Construction sector, now the unwinding of the mining boom is almost complete.
- Employment in **Education and Training** is projected to increase by 116,200 (or 12.0 per cent) over the five years to May 2022. This is expected to be supported by growth in the school aged population, continued strength in the International Education sector, growing demand for adult and community education and continuing growth in part-time workers and non-teaching staff in the industry.
- Solid employment growth of 97,600 (or 11.2 per cent) is projected for **Accommodation and Food Services** over the five years to May 2022. This is supported by a burgeoning Australian café culture and improvements in both domestic and international tourism, as a result of the lower Australian dollar and expanding middle class in Asia.

- **Retail Trade** employment is projected to grow by 45,600 (or 3.7 per cent). The two main factors inhibiting employment growth in the Retail Trade industry, compared with the pre-GFC period, are relatively slow discretionary consumer spending growth and more intense domestic and international competition. This has forced retailers to reduce staff-to-revenue ratios to lower costs.
    - Population growth is expected to sustain employment growth in some sectors of the Retail Trade industry, with employment in the Supermarket and Grocery Stores sector (a non-discretionary goods sector) projected to grow by 24,000 (or 8.1 per cent) over the five years to May 2022.
    - In contrast, employment in the Department Stores sector, which is particularly dependent on growth in discretionary consumption and susceptible to online competition, is projected to fall by 6900 (or 8.9 per cent) over the five years to May 2022.

- Employment in **Mining** is projected to grow by 5600 (or 2.4 per cent) over the five years to May 2022. This is 37,500 (or 13.7 per cent) below the series high workforce of 274,300 in August 2012. The lower level of employment reflects the passing of the mining investment boom, with the transition eased by a favourable dollar and commodity prices. Employment growth in the industry is expected to be supported by increasing investment in exploration, particularly of gold, and increases in metal ore mine production from existing mines.

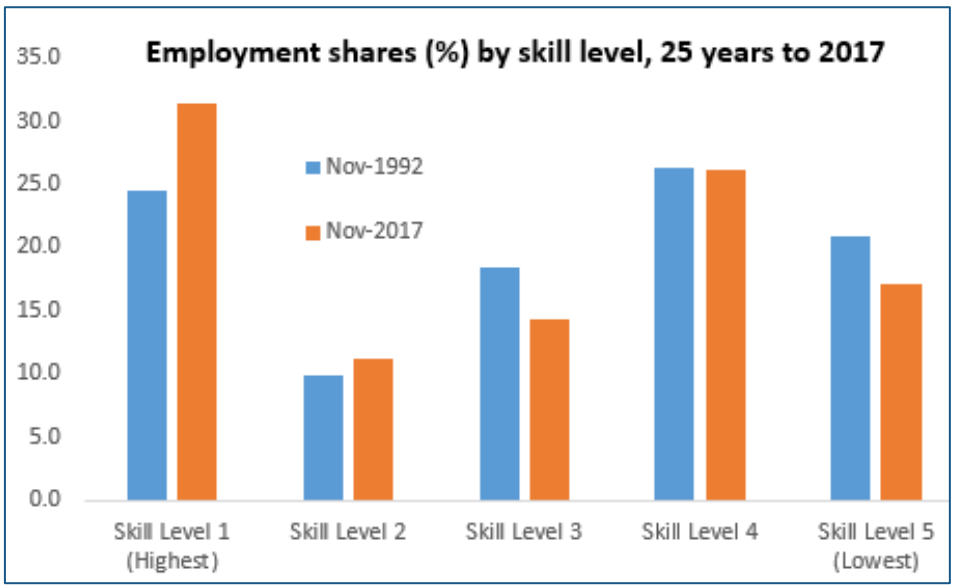


- The long-term decline in **Manufacturing** employment is expected to continue, with employment in the industry projected to decline by 38,300 (or 4.2 per cent) over the five years to May 2022. The decline is expected to be driven, in part, by a fall in the Motor Vehicle and Motor Vehicle Part Manufacturing sector, reflecting the closure of the Toyota and Holden plants in 2017, and the closure of the Ford plant in 2016. While the lower Australian dollar should offer some support to the rest of the industry, there is a long-term trend of falling employment in many sectors of the Manufacturing industry.



Skills commentary

The demand for highly skilled workers has increased in Australia's transition to a services-based economy. This highlights the importance of education and qualifications for those in the workforce seeking career advancement and for labour market entrants wishing to improve their employment prospects. Advances in automation technologies will also require stronger and more continuous connections between skills training and work, a process often called 'lifelong learning'.



5. The future of work and its impact on regional Australia

Technological change will continue to bring many benefits to regional areas. Australia's regional towns and centres are spread over wide geographical distances and, while this poses challenges for some regions in terms of physical connectivity, improved technology will bring solutions that significantly improve the overall connectivity of regions. As the Productivity Commission notes:

> Australia's regions have enjoyed overall employment growth and improved social connections as technology is helping to bring people closer together (virtually, if not physically)— this will only improve further in the future. This has provided new opportunities for many regional towns and helped to cement their long-term viability and vitality'.[23]

For example, improvements in technology may make it easier for regional workers to acquire new skills and knowledge through greater access to training and education opportunities. There will be new ways of working remotely and gig economy jobs will expand employment opportunities in regional areas beyond traditional employment. Greater virtual connectivity will help regional areas attract skilled labour. Developments such as 3D printing may, for example, help regional areas be competitive rather than relying freighting parts over long distances from urban or other areas. However, labour market disparity (across both regional and metropolitan areas) is always likely to exist irrespective of the underlying strength of the economy and labour market.

As noted by the Productivity Commission, Australia's regions have highly diverse characteristics, experiences, risks and opportunities. How successfully regional areas respond to technological change will ultimately depend on whether they are able to take advantage of available opportunities.[24] Technological change will affect every region differently in the future and some will need support to seize the associated opportunities. For example, regional communities with a narrower industry base, regions with a large 'single employer' and those with a large base of lower skilled workers, will face greater challenges and may need specific support to up-skill job seekers and ensure businesses have access to the skills they need to grow and benefit the local economy.

The Department provides labour market structural adjustment programs, on a case-by-case basis in exceptional circumstances, to assist retrenched workers to find new employment as quickly as possible. These programs have been set up in response to large-scale retrenchments, to provide retrenched workers with tailored assistance and access to intensive employment services. The Department also contracts employment facilitators in affected regions to provide a local point of contact and, in collaboration with jobactive providers, connect retrenched workers with training, job opportunities and other support. In addition, the recently announced Stronger Transitions package of assistance will be available from 1 July 2018 in five regions facing significant structural change. This will assist retrenched workers to find new jobs and take advantage of labour market opportunities across Australia.

Department research indicates 54 per cent of employers in regional areas believe technological advancement is significantly affecting their business. The vast majority of these employers (71 per cent) see technology advancement as an opportunity (for example, the internet is opening up new lucrative markets), while only 17 per cent see this as a challenge (for example, they cannot find technically able staff).[25]

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[23] Productivity Commission, Transitioning Regional Economies, Study Report, 2017, p 4.

[24] Productivity Commission, above n 23, p 64.

[25] Department of Jobs and Small Business, Survey of Employer's Recruitment Experiences.

Reflecting the positive outlook for regional Australia, the Department projects total employment in regional Australia will increase by 231,600 (or 6.1 per cent) over the five years to May 2022, with employment expected to increase in 15 of the 19 broad industries and remain steady in one. This compares with projected growth of 8.7 per cent for capital city regions of Australia.

- The shift towards services industries is projected to continue in regional Australia, with **Health Care and Social Assistance** projected to make the largest contribution to employment growth (increasing by 83,100 or 16.3 per cent). Much of the employment in this industry comprises non-routine work that is difficult to automate. Large employment increases are also expected in **Education and Training** (31,100 or 10.5 per cent), **Construction** (29,800 or 8.3 per cent) and **Accommodation and Food Services** (29,000 or 9.6 per cent). Together, these four industries are projected to provide 69.9 per cent of total employment growth in regional Australia over the five years to May 2022.

- In contrast, employment in regional Australia is projected to fall in **Manufacturing** (down by 8500 or 3.1 per cent), **Electricity, Gas, Water and Waste Services** (4800 or 9.5 per cent) and **Agriculture, Forestry and Fishing** (2700 or 1.1 per cent). However, for every one of the jobs expected to be lost in these industries, many more will be created in other industries.

    - The lower Australian dollar is expected to support parts of the Manufacturing industry, however, the long-term trend of falling employment in many sectors of the industry is expected to continue.

    - Some regions are expected to grow total employment strongly despite their exposure to the Manufacturing industry. For example, employment in Geelong is projected to grow by 12,400 (or 9.4 per cent) over the five years to May 2022 despite an expected fall in Manufacturing employment of 1200 (or 12.1 per cent). Increases in Health Care and Social Assistance, Construction and Public Administration and Safety are expected to drive employment growth in this region.

6. International institutions and the future of work

Key international institutions have the future of work high on their agendas.

The OECD, G20 and the work of some countries

In its 2017 Ministerial Council Declaration, the OECD recognised that digitalisation, automation, artificial intelligence and other technological advances will lead to change, altering the nature of work and the functioning of labour markets. In this context, the OECD calls for economies to adopt policies that support skills, innovation, long-term investment and inclusive growth. OECD projects are analysing:

- the impacts of digitalisation and broad technological change
- evolving working conditions and employment relationships
- international economic linkages
- the challenges the Future of Work poses for labour market institutions and social protection systems.

The Group of Twenty (G20) is also actively considering themes of digitalisation, demographic change and globalisation. At the Labour and Employment Ministerial Meeting in May 2017, the G20 agreed on priorities concerning the future of work, with an emphasis on:

- strengthening skills development and adaptation throughout the working life
- modernising social protection
- encouraging social dialogue and adaptation at the workplace level
- harnessing the opportunities of structural change for new and better jobs, including with displaced workers in vulnerable regions.

These priorities form part of the G20's multi-year agenda, building on policy commitments in specific areas such as entrepreneurship and public employment services that would better meet current and future needs.

Developed and emerging countries and international forums, including the Asia Pacific Economic Cooperation (APEC) forum, value the importance of exchanging policy practices in the context of the future of work challenges. At a national level, the Danish Government has established the 'Disruption Council' to embrace future opportunities and respond to challenges. The Council consists of members from trade unions, employer organisations, entrepreneurs, experts, CEOs, ministers and young people. It facilitates policy discussions on future skills, free trade, international partnerships, new business models, technology and lifelong learning. As a further example, Singapore has established the 'WorldSkills Council' to oversee WorldSkills Singapore. This initiative provides an opportunity for Singaporeans to develop their full potential through skills acquisition and lifelong learning, together with ensuring workers' skills remain relevant.

The International Labour Organization

The International Labour Organization (ILO) has launched several initiatives considering key challenges in effectively fulfilling its mandate in the coming years, within the framework of its centenary commemorations in 2019. Australia's engagement in the Future of Work initiative is contributing a domestic and regional perspective to this important discussion.

Future of Work Centenary Initiative

The ILO's Future of Work Centenary Initiative aims to enable an in-depth discussion on the future of work and provide the ILO and member States, including Australia, with further guidance on effectively preparing and responding to new work structures and industries as they evolve in the 21st century. In 2016, the initiative requested member States conduct national dialogues on the future of work with employer and worker organisations. Australia actively participated in this process, holding dialogues with its social partners, the Australian Council of Trade Unions (ACTU) and the Australian Chamber of Commerce and Industry (ACCI), and other stakeholders in 2016 and 2017. These discussions focused on the economic and regulatory environment as well as social and technological drivers influencing work into the future, Australia's frameworks for consulting on workplace reforms, upcoming challenges for Australia, and representation at the ILO. The outcomes of these discussions were reported to the ILO.

The ILO has also established a High Level Global Commission on the Future of Work to recommend policies to member States for managing future of work challenges. This Commission will examine the outcomes from national dialogues and publish its report in 2018.

Additionally, as part of the initiative, the ILO held a global dialogue in 2017 to reflect on the role of the ILO in preparing for and advising government on the changing nature of work. Participants, including Australia, discussed future of work issues including globalisation, automation, youth employment, women's participation, and the potential for increased inequality and changes in the nature of developed and developing societies. The suitability of the ILO's tripartite membership model to address these issues was also discussed. The ILO agreed to consider conducting a large-scale international survey on attitudes to the future of work to guide its future priorities and help translate the dialogue into tangible action.

In June 2017, the Department granted the ILO $200,000 to deliver a project on Women and the Future of Work in the Asia-Pacific Region. The ILO has acknowledged this as the largest contribution so far to the Future of Work Centenary Initiative program of work by members. The project consists of two parts: a regional Conference in Bangkok on 31 January and 1 February 2018, followed by a research report to be released in the first half of 2018 and submitted to the Global Commission on behalf of the Asia Pacific region.

The project will promote effective strategies for women in the future of work to assist both developed and developing countries. The project will highlight successful initiatives in the Asia-Pacific region and produce concrete policy and program suggestions useful for both employers and employees in the rapidly changing future of work.