BENEFITTING FROM GLOBALISATION AND TECHNOLOGICAL CHANGE IN AUSTRALIA

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By Urban Sila and Philip Hemmings

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Abstract / Résumé

Benefitting from globalisation and technological change in Australia

Australia has seen large rises in living standards over the last decades across the whole of the income distribution. Technological change and international trade have contributed to this success, but have also brought structural change. Some industries have declined, while others flourished. Furthermore, new technologies and structural change create new skills and new tasks, boosting demand for some jobs, while making others disappear.

Although technology and globalisation have not decreased overall employment, certain people, groups, and communities have undergone disruptive change and experienced falling living standards. Some groups face a higher risk of poverty and laid-off workers can have difficulty finding a new job. Well-informed and well-targeted policy is therefore needed to ensure that the benefits of technology and globalisation are widely shared.

This paper focuses on policies to ensure that everyone in Australia has the opportunity to benefit from technological change and globalisation. The paper assesses policies relating to three issues: i) labour markets and active labour market policies; ii) education and skills; to ensure adequate skills for accessing good quality jobs; and iii) urban environments, ensuring that Australia's highly urbanised population can adapt to change.

JEL Codes: D31, E24, F6, H5, H7, I2, I3, J2, J3, O18, O3

Keywords: Australia, technological change, globalisation, income distribution, inequality, labour market, job polarisation, education, skills, welfare policies, activation policies, urbanisation, metropolitan areas

ce que chacun soit doté des compétences requises pour accéder à des emplois de qualité ;
et iii) les environnements urbains, en vue de s’assurer que la population très urbaine de
l’Australie soit en mesure de s’adapter aux changements.

Codes JEL : D31, E24, F6, H5, H7, I2, I3, J2, J3, O18, O3

Mots clés : Australie ; développement technologique ; mondialisation ; distribution de revenus ; inégalité ;
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 politique de l’activation ; urbanisation ; zones métropolitaines

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Benefitting from globalisation and technological change in Australia

Urban Sila and Philip Hemmings

Introduction

Technological change and international trade have brought large rises in living standards to Australia. Yet, they have also brought structural change and disruption. New technologies and the entrance of new countries to global markets change supply and demand for products, services, labour and skills within and across countries. They also bring reallocation of economic activity across sectors and across the globe. In this way, some industries that have been a source of jobs and incomes decline - as has been the case for manufacturing in Australia - while others - such as business services - rise. Furthermore, new technologies and structural change require new skills and new tasks, creating demand for certain jobs, while making others disappear. This has implications for inequality and may diminish social cohesion.

These processes create winners and losers and they also create uncertainty. Experience indicates that technology and globalisation have not decreased overall employment in Australia, yet certain people, groups, and communities have undergone disruptive change and experienced falling living standards. Well-informed and well-targeted policy is needed that ensures that the benefits of technology and globalisation - higher productivity, new and better quality jobs and new and better products and services - are widely shared.

This paper focuses on policies to ensure that everyone in Australia has the opportunity to benefit from technological change and globalisation. As such it is centred on the socio-economic consequences of these processes; the issue of how Australia can best harness them (for instance through innovation policy) has been addressed in OECD Surveys. The first section of the paper describes how these processes have affected Australia in terms of living standards, industry structure, labour market, job polarisation and inequality and poverty. The paper then assesses policies relating to three issues: i) labour markets; in particular ensuring that the system effectively enables and encourages the unemployed or those out of the labour force to find jobs; ii) education and skills; ensuring that Australians are equipped with adequate skills to be able to access good quality jobs; and iii) urban environments, ensuring that policy frameworks help Australia’s highly urbanised population adapt to change, for instance through ensuring jobs are accessible through good transport systems.

1 Urban Sila is an economist and Phil Hemmings is a senior economist in the Country Studies Branch of the OECD Economics Department. For valuable comments and suggestions the authors would like to thank Patrick Lenain, Alvaro Pereira, Isabell Koske (all from OECD Economics Department), Michael Förster, Andrea Salvatori, Duncan MacDonald and Willem Adema (all from OECD Employment, Labour and Social Affairs Directorate), Shane Samuelson and Katharine Mullock (both for the Directorate for Education and Skills) and various Australian officials and the EDRC Committee. Excellent statistical assistance from Damien Azzopardi and editorial assistance from Stephanie Henry were also greatly appreciated.
Technological change and globalisation have raised material living standards…

Technological change and globalisation are core drivers of growth. Over a very long period of time, many economies, including Australia, have experienced trend increase in material living standards (Figure 1.1). Technology has been key to productivity growth (Figure 1.2), underpinning growth in wages, GDP per capita and well-being more generally, with improvements in health, infrastructure and educational attainment. Trade liberalisation has supported productivity growth by facilitating specialisation and trade integration has increased economic efficiency and technology diffusion. Technology and globalisation have reinforced each other, and the information and communication technology (ICT) revolution has further enabled the cross-border trade in services.

Figure 1. Advanced economies have experienced large rises in living standards

GDP per capita, Thousands USD, constant prices, 2010 PPPs

Source: OECD Productivity database.

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Technological change has been accompanied by rising aggregate employment, as has been the case in many other OECD countries. Fears that labour-displacing technological progress and improvements in productivity would bring about a large drop in available jobs have not materialised. In fact, productivity increases have been associated with more employment, particularly so in Australia (Figure 1.3). While workers were displaced in declining sectors, the overall rise in wages and incomes and demand for other products and services generated enough offsetting demand for labour. Borland and Coelli (2017) report that the total amount of work per capita in Australia has been roughly stable over the last five decades (Figure 1.4). In particular, the amount of work has not fallen following the introduction of computer-based technology, as feared by many.
Figure 3. Higher labour productivity is associated with more employment

Source: OECD Analytical database and Productivity database.

StatLink 2 https://doi.org/10.1787/888933883396

Figure 4. There has been no strong long-term trend in hours of work per capita

Notes: Actual hours worked = Average weekly actual hours worked* Employed persons by hours worked. Source: OECD Analytical database; and Thomson Reuters.

StatLink 2 https://doi.org/10.1787/888933883415

…but have also been a source of structural change and disruption

As in all OECD economies, the sectoral composition of the economy has shifted dramatically over the long term (Figure 1.5), away from goods production and towards services. With higher incomes, consumers typically spend a greater share of their income on services compared to goods, and changing consumer preferences and population ageing also shape demand. In addition, the shift to services - in particular business services - reflects shifts in how goods are produced. Supply chains have lengthened with goods-
producing industries becoming more focused on core activities and outsourcing non-core activities (Adeney, 2018). Moreover, production has become more fragmented across countries (Hummels et al., 2001, De Backer and Miroudot, 2013, Timmer et al., 2014) with the rise of global value chains (GVCs). For Australia, largely due to falling international trade costs and the entrance of emerging markets such as China, a greater share of the production stages of supply chains now occurs overseas (Kelly and La Cava, 2014).

Figure 5. The sectoral composition of Australian economy has shifted dramatically

Notes: GVA (gross value added). Excludes agriculture, forestry and fishing, public administration and safety, and ownership of dwellings.

StatLink https://doi.org/10.1787/888933883434

These processes have also affected the labour market, with implications for the types of jobs and required skills. Mirroring the industry mix, employment in Australia has moved away from manufacturing towards services (Figure 1.6). This transformation has caused significant disruption for some workers (OECD, 2017a). One policy challenge is that employment is being reshuffled across occupations and industries, generating risks of job loss and potentially difficult transition into new employment. Workers remaining in the same job, on the other hand, face challenges from changing skill demands. Differential changes in skill demands, driven by changing industrial structures, moreover affect trends in inequality (Acemoglu and Autor, 2011).
Figure 6. The sectoral composition of Australian employment has also changed

StatLink 2 https://doi.org/10.1787/888933883453

Job polarisation and changes in the demand for skill

Similar to other OECD countries, the labour market has experienced increased polarisation into high-skill/high-paying jobs and low-skill/low-paying jobs, with a hollowing out of middle-skill jobs (OECD, 2017a). Coelli and Borland (2016) find evidence of job polarisation in Australia from the mid-1960s onwards, with particularly rapid change in the 1980s and 1990s (Figure 1.7). For the period between 1966 and 2011 they report employment-share increases in low- and high-pay jobs of 2 and 17 percentage points, respectively, with corresponding fall in the share of employment in middle-pay jobs of 19 percentage points. Australian household survey (HILDA) data further illustrate this process for the last 15 years, with highest gains in the share of jobs in high-skill category, moderate losses in the share of jobs in low-skill and bigger losses in middle-skill category (Figure 1.7). Job polarisation is therefore not new. Yet, due to further advances in digital technologies and complexity of tasks that computers can perform, together with related impact on the labour market, it attracts continued attention.
One driver of job polarisation is technology's differential impact across skills and occupations, crucially depending on type of tasks performed (Autor et al., 2006; Goos and Manning, 2007; and Goos et al., 2009; OECD, 2017a). In particular, ICT generally complements high-skill workers performing complex cognitive tasks typically found in managerial and professional occupations (e.g. medicine). Conversely, middle-skill clerical and production jobs, characterised by “routine” tasks, can be more easily automated with ICT (e.g. computational tasks). Meanwhile, many low-skill jobs (e.g. catering, cleaning or delivery) involve non-routine manual tasks that have so far proven more difficult to
 automate. This "routinisation" hence lowers demand for middle-skill jobs relative to both high-skill and low-skill jobs. In addition, declining share of middle-skill jobs in advanced economies has also been linked to globalisation, through import competition from emerging economies and offshoring of production (Oldenski, 2014; Autor et al., 2016; Keller and Utar, 2016).

Consistent with the routinisation hypothesis, Australia's share of routine manual jobs has undergone considerable decline (Figure 1.8; Heath, 2016). Similarly, Coelli and Borland (2016) find large declines in the employment shares of occupations that were initially high in routine-task intensity.

**Figure 8. Routine manual jobs in Australia are being replaced by non-routine cognitive and non-routine manual jobs**

Note: The categories are based on the 8 majors ANZSCO (Australian and New Zealand Standard Classification of Occupations) groups. Non-routine cognitive: (Managers, Professionals), Routine manual (Technicians and trades workers, Machinery operators and drivers, Labourers), Routine cognitive (Clerical and administrative workers, Sales workers), Non-routine manual (Community and personal service workers).

Source: Thomson Reuters and OECD Calculations.

Technological change and globalisation are ongoing. Change associated with further ICT advances (Figure 1.9) continues to be prominent. Much of this involves further dissemination and adaption of technologies that have already proven commercial viability. Meanwhile, at the forefront of development, digital technologies based on big data analytics and artificial intelligence (AI) increasingly permit machine functionalities that can rival human performance across an increasing number of cognitive tasks. Cloud computing and the Internet of Things are widening the scope for intelligent systems and autonomous machines, such as robots. This said, there is considerable uncertainty regarding how quickly and widely such innovations will reach industrial application and commercial use (OECD, 2016a; OECD, 2017a, OECD 2018a).

Understanding which jobs and skills are likely to become obsolete as ICT and related technologies develop further is important. Some studies suggest an accelerated diffusion of AI-enabled robots could lead to significant job losses and technological unemployment (Brynjolfsson and McAfee, 2011; Mokyr et al., 2015). For instance, Frey and Osborne (2013) estimate that close to 50% of U.S. employment is at risk. However, recent OECD
work, exploiting the Survey of Adult Skills (PIAAC), suggests the share of jobs-at-risk from automation may be considerably smaller. This research (OECD, 2017a; Arntz et al., 2016, Nedelkoska and Quintini, 2018) argues that jobs with the same occupational title often have considerable differences in tasks, which is essential to gauging jobs at risk. Using the methodology of Arntz et al. (2016) the estimated share of jobs at high risk of automation (defined as jobs with at least 70% probability of automation) is only 7% for Australia (Figure 1.10), significantly lower than reckoned by some commentators. Nevertheless, many jobs in Australia - 26% according to Arntz et al. (2016) - will be significantly changed by technology (Figure 1.10), requiring different and new skills.

**Figure 9. Growing use of information and communication technologies**

Net capital stock, Constant prices, Billions AUD

![Figure 9](https://doi.org/10.1787/888933883510)

As regards future skill requirements, rising routinisation and further expansion of ICT applications increases demand for skills that are complementary to technology. As reported by Nedelkoska and Quintini (2018) occupations with high automatability typically only require a low level of education, while the least automatable occupations almost all require professional training and/or tertiary education. In addition to ICT-specialist skills, there is increasing demand for ICT-generic skills that enable use of technologies for professional purposes and for ICT-complementary skills such as information-processing, problem-solving and communication. Foundation skills, digital literacies as well as social and emotional skills are important for effective use of technology. Moreover, stronger core skills and readiness to learn can ensure that individuals will be able to adapt more easily (OECD, 2016b and 2017b).
Figure 10. There will be further automation of tasks

Share of jobs at risk of automation, %

Note: Jobs are at high risk of automation if the likelihood of their job being automated is at least 70%. Jobs at risk of significant change are those with the likelihood of their job being automated estimated at between 50 and 70%.


StatLink 2 https://doi.org/10.1787/888933883529

Australian jobs have not become more precarious

Technological progress and globalisation have also been associated with the shifts in the type, quality and security of jobs. Non-standard forms of employment - part-time work, temporary work, self-employment and casual work – have been on the rise across OECD countries since the 1990s and there has been longstanding debate about the positive and negative dimensions of this process (OECD, 2015, 2016c). The debate has been heightened in recent years with the spread of new forms of work via the “gig economy”, and the “platform economy” (such as AirBnB or Uber).

Australia has a comparatively high share of part-time work (Figure 1.11), but small shares of temporary workers and self-employed (these groups are not mutually exclusive; workers can work part-time and be on a temporary contract, for example). Australia has a particular form of casual work; workers are not entitled to paid sick or holiday leave but are guaranteed additional pay. According to Borland and Coelli (2016) this form of employment has been declining since the early 2000s (Figure 1.12). Furthermore, job duration has, if anything, risen (Figure 1.13). This partly counters concerns that Australian jobs have become significantly more precarious over time.
Figure 11. The share of part-time work is high in Australia, while shares of temporary employment and self-employment are low

A. Part-time employment
% of total employment, 2017

B. Temporary employment
% of dependent employment, 2017

C. Self employment
% of employment, 2017


StatLink: https://doi.org/10.1787/88893383548
Figure 12. The upward trend in casualisation has been reversed

Share of all workers in casual jobs, by gender, 1984 to 2014

Notes: Casual employment is characterised by flexibility for employers and employees in the number and timing of hours worked from week to week (including the ability for employers to very readily reduce hours to zero). Typically, employees are not entitled to paid annual and sick leave, but receive a higher pay (casual loading). A break occurs between 2006 and 2007 as the sampling frame for questions on paid leave entitlements was changed between these years.

Source: Borland and Coelli (2016) “Labour Market Inequality in Australia”.

StatLink https://doi.org/10.1787/888933883567

Figure 13. The duration of jobs has not fallen

Source: HILDA database and OECD calculations.

StatLink https://doi.org/10.1787/888933883586

Australia has been quite resilient despite structural change

So far, Australia has showed resilience in the face of structural change and shocks. Notably, it fared relatively well during the global financial crisis, although partly on the back of the commodity super-cycle. Australia’s resilience is underpinned by a dynamic and flexible
labour market, with high employment rates and low unemployment rates. Labour-market dynamism is reflected in high job turnover; job separation is high (Figure 1.14), most of it voluntary. Also, while the displacement rate (the share of workers laid off for economic reasons) is high, around 80% of displaced workers find new jobs within two years (Figure 1.15) (OECD, 2017c and 2016d; Sila, 2018).

**Figure 14. Australia’s labour-market separation rate is high**

Difference between the hiring rate and the net employment change, % points, 2016¹

![Graph showing labour-market separation rate](https://doi.org/10.1787/888933883605)


Nevertheless, Australia has seen socio-economic deprivation emerge in some localities characterised by high unemployment and poverty. While the overall labour market is dynamic, some laid-off workers nevertheless face difficulties in finding new jobs (see Box 1.1). Comparing unemployment rates across the relatively aggregate level of states and territories illustrates differences in exposure to change (Figure 1.16).

The secular decline of Australian manufacturing can serve as an example of the differing impact of structural change across different local areas. Manufacturing tends to be concentrated in localities within metropolitan areas. The Productivity Commission (2017a, Box 1.1) compares experiences of two local areas, Geelong (near Melbourne, Victoria) and Adelaide - North (South Australia), where large automotive plants were closed in 2016 and 2017, also prompting job losses among local suppliers. There are important differences between the two regions that will likely drive differences in how well they adjust to the closures. First, Adelaide - North has much higher local unemployment. Second, the greater metropolitan area of Melbourne has high population growth and strong demand for labour, in particular in services and construction, whereas greater Adelaide is much less booming. Finally, skills and education differ; on average, Adelaide - North residents have fewer qualifications than those in Geelong and a higher share are blue-collar workers, which negatively impacts the probability of re-employment (see Box 1.1).
Figure 15. Displaced workers find new jobs rapidly
Re-employment rates after displacement in selected OECD countries*, 2000-13 percentages

Note: a) For countries with self-defined definition of job displacement, data refer to workers who lose their job for economic reasons, due to the end of a temporary contract or for cause. For countries with firm-identified definition of job displacement, data refer to workers who lose their job due to a mass layoff or firm closure. For full details of the data sources and methodology, see Table A1.1 in Annex A.1 of OECD (2013). b) Data refer to an average of 2000-08 for Canada, to an average of 2004-08 for France and the Russian Federation, to an average of 2000-04 for Germany, and to an average of 2004, 2006 and 2008 for the United States. There are no data on re-employment within two years for France and for the United States. c) Data refer to 2009 for Korea, Portugal and Sweden, and to 2010 for the United States for self-defined displacement. d) Data refer to an average of 2011-13 for Australia and Japan, to an average of 2011-12 for Denmark and Finland, and to an average of 2012 and 2014 for the United States for self-defined displacement.


StatLink: https://doi.org/10.1787/888933883624
Figure 16. Unemployment experience differs across states and territories

Unemployment rate, % of labour force

Source: Thomson Reuters.

StatLink: https://doi.org/10.1787/888933883643

BENEFITTING FROM GLOBALISATION AND TECHNOLOGICAL CHANGE IN AUSTRALIA

Unclassified
This box analyses the incidence and consequences of job displacement using Australia's household panel - the Household, Income and Labour Dynamics (HILDA) Survey data. It reports the main results of the analysis in Sila (2018), and is based on previous OECD work on displacement and re-employment (OECD, 2017c and 2016d). The results refer to the 2001-2016 period. Displaced workers are workers who lose their job for economic reasons, due to the end of a temporary contract or for cause.

Reflecting the dynamic nature of the Australian economy and its labour market, job turnover is high compared with most other OECD countries. According to the HILDA data, about one-fifth of all employees aged 20-64 are separated from their job every year. In general, only a minority of job separations tend to be for economic reasons (i.e. "displacements"), while the rest are voluntary. In 2015-16 only about one fifth of workers who separated from their jobs were displaced workers.

Figure 17. Probability of finding employment after being displaced differs across groups of workers

Note: Predicted probabilities from multivariate probit - specification (4) from Table 2. Predicted probabilities are evaluated at the mean value of all RHS variables. Only selected characteristics are shown - those that show some significant variation across different values.


StatLink: https://doi.org/10.1787/888933883662

Certain groups of workers are more at risk of displacement than others. Sila (2018) estimates the probability of displacement using multivariate probit regression, controlling for various worker and job characteristics. Being male, an older worker and a worker with less than secondary education all raise the risk of displacement. In certain industries, such as construction and manufacturing, the incidence of displacement has consistently been higher over the last fifteen years. There is a clear pattern with respect
to job tenure, whereby workers with lower tenure face a higher probability of being displaced, especially for tenure of less than one year. Similarly, casual employees have a higher probability of being displaced.

A very high proportion of displaced workers find a new job soon after being displaced. According to HILDA data, more than 60% of displaced workers find employment within one year, and close to 80% find work within two years. But certain groups of workers have a significantly lower incidence of regaining employment (Figure 1.17). Based on multivariate probit, after controlling for other characteristics, women, older workers, and less educated workers, workers who had a casual job and part-time workers have a significantly lower chance of returning to employment. There is also tentative evidence that workers who worked in manufacturing, after controlling for their other characteristics, find it more difficult to find a new job.

Having said that, for certain groups this does not necessarily imply that finding a job is more difficult. Perhaps becoming displaced simply lowered their labour market attachment and they did not even search for a job. Indeed, analysing the probability of being out of the labour force after displacement we find that in particular women, older workers and workers in low-skilled occupations are more likely to become detached from the labour market. Labour market policy should therefore pay special attention to prevent such workers from becoming discouraged and keep them attached to the labour market.

The rise in income inequality has slowed

Income inequality (after taking into account taxes and transfers) in Australia has risen slightly, and is somewhat above the OECD average. However, this increase has slowed and inequality has stabilised in the last decade (Figure 1.18). Though overall inequality has been constant for some time and incomes of all groups have continued rising considerably in real terms, gains of the top quintile and the bottom two quintiles have been larger than in the middle of the income distribution over the past 15 years (Figure 1.19).
Figure 18. Income inequality in Australia has risen and remains above the OECD average

A. Gini (disposable income, post taxes and transfers)

B. P90/P10 disposable income decile ratio

C. Gini (disposable income, post taxes and transfers)

D. Impact of taxes and transfers on inequality reduction

Note: Panels A, B and C refer to whole population. The Gini coefficient is a measure of income inequality ranging from 0 (perfect equality) to 1 (perfect inequality). Panel D indicates the difference between the Gini before and after taxes and transfers.

Source: OECD, Income Inequality database.

StatLink https://doi.org/10.1787/888933883681

Australia's income inequality has risen primarily due to higher earnings inequality. Borland and Coelli (2016) find that while hours worked have become more evenly allocated among...
the population (more people work), wage gaps among workers have risen. Rising female labour-force participation has been a core driver of the more even allocation of work (Figure 1.20). That said, the share of people working part-time, for both men and women, has also risen. Since 2000 the rise in earnings inequality has slowed. While wage rates have grown most quickly at the top and for high-skill occupations (Figure 1.21), pushing inequality higher, total working hours have increased more at the bottom, offsetting the effect. In particular at the bottom, increased employment, longer hours worked, and generally a decline in the share of jobless households have reduced income inequality (Greenville et al., 2013; Sila and Dugain, 2018a).

**Figure 19. Growth of incomes in the middle has been comparatively weaker over the last 15 years**

| % growth in mean disposable household income by quintile, 2000-01 to 2015-16 |

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<tr>
<th>Quintile</th>
<th>2000-01</th>
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<td>Lowest quintile</td>
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<td>8%</td>
<td>7%</td>
<td>6%</td>
</tr>
<tr>
<td>Second quintile</td>
<td>12%</td>
<td>10%</td>
<td>9%</td>
<td>8%</td>
</tr>
<tr>
<td>Third quintile</td>
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<td>12%</td>
<td>11%</td>
<td>10%</td>
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<tr>
<td>Fourth quintile</td>
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<td>14%</td>
<td>13%</td>
<td>12%</td>
</tr>
<tr>
<td>Highest quintile</td>
<td>18%</td>
<td>16%</td>
<td>15%</td>
<td>14%</td>
</tr>
</tbody>
</table>

*Note: Equivalised disposable household income, adjusted for inflation.
Source: ABS Catalogue 6523.0.*

StatLink [https://doi.org/10.1787/888933883700](https://doi.org/10.1787/888933883700)
**Figure 20. Female participation and the incidence of part-time work have risen**

A. Employment rate

<table>
<thead>
<tr>
<th>Year</th>
<th>Women</th>
<th>Men</th>
<th>All persons</th>
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<td>2014</td>
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<tr>
<td>2018</td>
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</tbody>
</table>

B. Part time employment to total employment by gender

<table>
<thead>
<tr>
<th>Year</th>
<th>Men</th>
<th>All persons</th>
<th>Women</th>
</tr>
</thead>
<tbody>
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StatLink [https://doi.org/10.1787/888933883719](https://doi.org/10.1787/888933883719)

**Figure 21. Wages have risen faster for high-skill occupations**

Real median wages (AUD), full-time employed individuals aged 15 and over


StatLink [https://doi.org/10.1787/888933883738](https://doi.org/10.1787/888933883738)

**Income poverty has declined but certain groups face a high risk**

Relative income poverty is slightly above the OECD average (Figure 1.22), according to measures that classify the poor as those living in households that have below 50% of the median equivalised household income (OECD, 2008). Sila and Dugain (2018b), using HILDA Survey data, show that income poverty has decreased in the last 15 years (Figure 1.23). The share of people living in households with income below 50% of the median household equivalent income decreased from 15% in 2001 to 12% in 2016. The
Productivity Commission (2018a) also finds that income poverty has decreased in recent years in its major recent report on inequality.

Figure 22. Poverty in Australia is above the OECD average

Poverty rates (poverty line 50%), Total population, 2016 or latest

Note: the poverty rate is the percentage of individuals who live in households with incomes below the poverty line (set at 50% of the median household income).
Source: OECD Income Distribution and Poverty database.

StatLink 2 https://doi.org/10.1787/888933883757

Figure 23. Poverty in Australia has decreased over time

Poverty rate, based on equivalised household income, population aged 15 and over

Note: the poverty rate is the percentage of individuals who live in households with incomes below the poverty line (set at 50% of the median household income).

StatLink 2 https://doi.org/10.1787/888933883776
Certain groups are however significantly more at risk than others. People living alone and lone parents are at higher risk of poverty. Poverty among the elderly has fallen in the last 15 years, but nevertheless remains very high. According to OECD data, about 25% of older Australians fall below the relative poverty threshold, one of the highest shares in the OECD. It should however be noted that poverty rates for the elderly are somewhat reduced when their home ownership is taken into account; moreover, many pensioners decide to take a significant amount of their pensions as a lump sum at the onset of their retirement, which thereafter does not count as current income. Indigenous Australians are almost twice as likely to be at risk of poverty than the rest of Australians. With respect to country of birth, foreign born Australians who have no English speaking background are at significantly higher risk, too (Figure 1.24). While for immigrants the poverty gap has declined, for the indigenous population the gaps appear to have risen in the latest two data points.

**Figure 24. Poverty rates across country of birth and indigenous status**

Note: the poverty rate is the percentage of individuals who live in households with incomes below the poverty line (set at 50% of the median household income).


Individuals out of the labour force and the unemployed are at much higher risk of poverty. But even some people who work are poor, commonly casual workers and part-time workers. People with low education are also at risk. People who live in lone person or one parent households face quite a high risk of poverty, even if they are employed.

Sila and Dugain (2018b) report results from a multivariate probit for the probability of poverty using household-panel data, where they control for personal and household characteristics. Marginal predicted probabilities across various characteristics are shown in Figure 1.25. Interestingly, ethnic background and indigenous status remain strong explanatory factors of poverty even after controlling for education, age, industry, skill and remoteness. This means that high poverty of indigenous people stems from unobserved characteristics such as health, life-style, the local economy or discrimination.
Welfare and activation policies to help workers face change

Ensuring that inactive, unemployed or displaced individuals are encouraged and incentivised to look for employment and re-skill is important for making economies resilient to globalisation and technological change – and to avoid socio-economic deprivation from it. Broadly speaking, workers in routine, automatable tasks will have to re-equip to non-routine tasks that are complementary to new technology rather than substitutable.

As emphasised in *OECD Surveys* (OECD 2017d and 2014), the fiscal demands of Australia’s welfare system are comparatively light, helping keep tax wedges on labour low, as well as supporting employment and competitiveness. There is strong emphasis on encouraging transition from welfare to work, whereby various financial incentives and
activation schemes together with means- and activity-testing help limit the number of households dependent on transfers.

Offering the right incentives to individuals to move from inactivity or unemployment into employment is however a challenging area of tax-benefit policy. It is difficult to avoid a fairly substantial implied tax for those on benefit taking up a job. Figure 1.26 shows the results of OECD microsimulations that calculate the participation tax rate of someone moving from inactivity (with attendant benefits) into a job at two-thirds the average wage across a range of family scenarios. Australia is generally doing better than most countries in this context. However the participation tax rates, especially for families, are still significantly above best performers and in certain cases above the OECD average. For instance, a person with two children and a spouse that also earns two-thirds of the average wage faces a 53% effective tax when moving from inactivity into employment.

Australia's tax-benefit incentives, including the participation tax rate, are shaped in particular by benefit tapering. As pointed out in the 2014 Survey (OECD, 2014), while Australia's focus on means-tested benefits has many strengths, high effective marginal tax rates generated by benefit tapering add to the challenges in policy design. The high marginal tax rates principally arise because benefits are means-tested and therefore reduced when a recipient’s income rises above a certain threshold. The lower the rate of benefit withdrawal, the lower the marginal-tax effect and attendant risk to incentives, but the greater the fiscal cost with respect to pay-outs and the weaker the benefit’s targeting. Furthermore, schemes cannot be viewed in isolation, as it is the net effect of all benefits and taxes that matters for incentives. Having said that, factors external to the tax and transfer systems are also important drivers of participation decisions, particularly for second earners. In particular, partner income, access to childcare, flexible working arrangements and personal preferences to be the primary carer of children.

Figure 26. Participation tax rate from moving into employment can be high

Participation Tax Rates for a transition from inactivity into full-time work, 2016

Notes: Participation tax rates measure the extent to which taxes and benefits reduce the financial gain of moving into work. In-work earnings are equal to 67% of average wage (AW). For married couples, the spouse is assumed to have full-time earnings with AW indicated in the labels. Children are aged 4 and 6 and neither childcare benefits nor childcare costs are considered. Source: OECD tax-benefit models http://www.oecd.org/els/soc/benefits-and-wages.htm.
The following sections examine three areas of policy: contracted employment services, displaced-worker support and boosting participation among mothers. For further coverage see Connecting People with Jobs: Key Issues for Raising Labour Market Participation in Australia (OECD, 2017c), Back to Work: Australia; Improving the Re-employment Prospects of Displaced Workers (OECD, 2016d), and Investing in Youth: Australia (OECD, 2016e).

Further improving services and outcomes for jobseekers

As discussed in the 2017 OECD Employment Outlook (OECD, 2017a) an activation framework should: i) motivate jobseekers to actively pursue employment; ii) improve their employability; and iii) expand the set of opportunities for them to be placed and retained in high-quality jobs. Given the potential in the future of multiple careers and jobs over a worker's working life, the system should also effectively support mid-career workers who are displaced by structural economic change and need to switch industry or occupation. Activation measures should also be preventive, taking into account ongoing megatrends and the risk of job loss in different sectors. They should provide workers with adequate information and re-employment support ahead of potential job losses, such as during the notice period prior to a mass redundancy.

Activation policies in Australia are well developed and generally quite effective in connecting people with jobs and, thereby, contribute to low rates of unemployment. Australia is also the only OECD country where employment services are provided entirely under contract with private-sector providers. Australia recently adopted an investment approach (the Priority Investment Approach to Welfare), to further ensure the effective and efficient spending of public resources, and established the Try, Test and Learn Fund to be used towards testing the effectiveness of innovative policies in raising labour market participation. This is a welcome step, although OECD (2017c) has argued that the actuarial-financial valuation of welfare used in the investment approach may be too narrow to ensure efficient resource allocation, and that employment and welfare spending decisions should include broader considerations, such as health and childcare. Also, an expert panel has been established to consider the future format of employment services (the current format expires in 2020). Changes in technology and the labour market will be key considerations in the new format (Australian Government, 2018).

Unlike most OECD countries, Australia does not have an unemployment insurance scheme that provides benefits linked to previous earnings, but has an entirely tax-funded unemployment assistance programme that is only intended to meet minimum income requirements. Unemployed persons receiving public income support are subject to a strict activity test. For instance they must be available for and willing to accept suitable work, including part-time and casual employment, and attend all scheduled interviews with Centrelink (the public benefit administration agency) and with their employment service provider. In addition, eligibility for the main unemployment benefit (Newstart) and some other benefits requires completion of the Annual Activity Requirement for six months each year. Work for the Dole – work experience programmes run by not-for-profit organisations or by local, state or territory government agencies - is the main way to meet the Annual Activity Requirement, but jobseekers can also perform other activities, such as part-time work, part-time study in an eligible course, accredited language, literacy and numeracy training or volunteering. Jobseekers unemployed for 12 months can also receive a relocation assistance payment to help taking a job elsewhere.
Employment services to jobseekers are provided by private providers (for-profit and not-for-profit) contracted by the government through a system called jobactive. Service providers are chosen through a competitive tendering process and evaluated through the Star Rating system, which ranks providers according to their performance in terms of employment and educational outcomes for jobseekers. For each client, providers receive an up-front administration fee and an allocation towards their Employment Fund, which is used to cover training and other costs towards enhancing employability of its clients. Jobseekers are assigned to three different services through the Job Seeker Classification Instrument, administered by Centrelink. The up-front fee received by the provider depends on which stream a job seeker is assigned to and on age and region. In addition, providers receive outcome fees if a jobseeker is placed into employment, with payments at 4, 12 and 26 weeks of employment. Outcome fees are the most significant for the providers financially.

Jobactive's fee structure focuses on getting jobseekers into employment as quickly as possible. Even short-term jobs (e.g. seasonal work, such as fruit picking) are rewarded as the first outcome payment is made after four weeks (of which providers can claim up to four per year and jobseeker). The rationale behind this policy is that that even short-term jobs can provide jobseekers with useful work experience and work habits that facilitate finding more stable longer-term employment (OECD, 2017c).

The fee structure could however be tilted more towards longer-term outcomes to ensure greater job retention. As argued in OECD (2017c), as providers receive no further fees after a client's 26th week of employment, longer-term employment outcomes are not strongly rewarded. Paying for employment outcomes beyond 26 weeks could promote employment retention and career advancement of workers, by better incentivising service providers to place jobseekers into better and more stable jobs and to deliver higher quality pre-placement training and post-placement assistance.

Experience from the UK Work Programme, which offered contracted out employment services for the long-term unemployed, shows that for certain groups of jobseekers prolonged support and incentives have a positive impact on job retention. Within the programme, outcome payments for providers are available from 1.25 up to 2.25 years after the initial placement. This encourages providers to assist participants with in-work help and advice. While there are challenges and a full impact evaluation is not available to date, Australia could nevertheless pilot variations to its existing jobactive payment model that provide such long-term outcome payments.

Another consequence of the relatively short time to reward for providers (4 weeks) in Australia is that jobactive providers are not strongly incentivised to provide training (OECD, 2018b). Spending on training for the unemployed, as well as the incidence of such training, is quite low in Australia. According to the internationally-harmonised data collected by the OECD, only 0.01% of GDP is allocated to skills training of the unemployed in Australia, which represents one of the lowest expenditures on training across OECD countries, even among countries with a similar or lower level of unemployment (Figure 1.27). Low spending on training reflects a low share of unemployed persons participating in training programmes as well as a small amount spent on each participant, which in Australia is among the lowest in the OECD (OECD, 2016d). In addition, only 37% of jobactive participants are satisfied with the help they receive in gaining skills for work, as reported by the Employment Services Outcomes Report, July 2016 to June 2017.

The "work first" focus of jobactive is also seen in provider performance assessment. A provider’s Star Rating is based on 12 months of performance, again limiting the incentives
to put jobseekers through longer-term skills training, even if doing so would result in better matches. International experience of training programs for the unemployed finds neutral or even negative employment effects in the short-term, while positive employment effects are evident only 2-3 years after completion of the program (Card, et al., 2017).

Figure 27. Spending on training for the unemployed is low in Australia

Incidence of unemployment and expenditure on training programmes, Australia and selected OECD countries, 2016 or latest available

Notes: The unemployment rate refers to the harmonised unemployment rate (HUR). Data refer to fiscal years for Australia, Canada, Japan, New Zealand and the United States. For Australia, expenditure on state and territory programmes is not included.


Facilitating job transitions of displaced workers

In Australia as in many other OECD countries, employment services are largely in place and prioritised for jobseekers receiving unemployment benefits (or income support), and link participation in job search and other activation steps to eligibility for that support. As such, the employment services are not targeting groups of workers who are more readily available for the labour market, such as (recently) displaced workers. These are, for instance, workers who have lost their job due to the business cycle or economic restructuring, but with otherwise stable employment careers in the past, and possibly confronting unemployment for the first time. The challenge therefore is to absorb these workers in the labour market and to match their skills with the skills required.

Jobactive is geared towards jobseekers on income support, whereas other jobseekers are eligible for only limited employment support in their first year of unemployment. This is further accentuated for workers who receive severance pay as this delays entitlement to income support and, correspondingly, more intensive employment support. They can access services voluntarily for up to 6 months but support is only basic. In most cases, displaced workers are not eligible for substantial re-employment support until after 12 months of unemployment. Finally, jobactive employment service providers generally lack
expertise and incentives to support displaced workers. In sum, many displaced workers in Australia end up receiving only little support, if any, and often very late. This raises the risk of demotivation, exit from the labour force, a cycle of unstable jobs and repeated spells of unemployment.

As discussed above, Australia has a flexible labour market that facilitates finding a new job. The legislation governing hiring and firing is not strict (Figure 1.28) and Australian employers face relatively few restrictions on layoffs, although there is protection against unfair dismissals. This approach promotes higher labour mobility and results in most unemployed workers finding their way back to employment relatively quickly (OECD, 2016d). However, public policy to help displaced workers encountering difficulty in finding employment is less developed than in some other OECD countries (OECD 2017c and 2016d). Instances of mass localised layoffs in Australia (the closure of automotive industry plants, for example), have prompted substantial ad hoc assistance programmes for displaced workers. This approach has in some instances been successful, however, it risks being patchy with support going to high profile layoffs. The majority of displaced workers in Australia, from individual displacements or displacements from small businesses, are left to the general system that offers little support.

Figure 28. Protection of permanent workers is low in Australia

Employment protection legislation indicators for OECD countries, 2013

Note: The figure presents the contribution of employment protection for regular workers against individual dismissal and additional provisions for collective dismissal to the indicator of employment protection for regular workers against individual and collective dismissals (EPRC). The height of the bar represents the value of the EPRC indicator.

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https://doi.org/10.1787/888933883871

Australia could benefit from a more comprehensive approach to mass layoffs that would cover all sectors of the economy, both permanent and casual workers and not limited to specific regions (OECD 2016d and 2017c). The cost of this approach could be limited by tailoring the intensity of the public response to the needs of the workers involved, depending also on the severity of the layoff, local labour market and economic conditions, and local institutional capacity.
A welcome move in this direction has been made with the introduction (in July 2018) of the federal government's temporary Stronger Transitions package. The scheme provides support to displaced workers in certain regions affected by structural change in order to assist their transition to new jobs. The package includes collaborative partnerships between the government and employers to help workers prior to displacement. It also provides immediate access to intensive employment support after displacement, as well as access to relocation assistance and help in exploring small business opportunities. More importantly, another initiative, Job Change (due to commence in July 2019), aims at making employment services immediately available for all retrenched workers (and their partners), before they become eligible for income support.

Modification to employer obligations in the case of collective dismissals could also help transition for displaced workers. Employers in Australia have only limited obligations towards workers they dismiss for economic reasons. Notice periods are relatively short in international comparison (OECD, 2016d) and in most cases the public authorities are notified after dismissals have already occurred. There is room to strengthen employer responsibilities towards displaced workers, including by introducing an obligation to keep training records to facilitate the recognition of skills obtained on the job. Early intervention in case of dismissal is now only possible when employers voluntarily notify the public authorities well in advance. Introducing and enforcing a longer notice period in case of collective dismissal, would make it easier for public authorities to provide information to workers about the services they can access before they are laid off. Counselling during the notice period can be quite effective, as trying to reach displaced workers after they have been displaced is much more difficult and costly.

Additionally, the Collaborative Partnership on Mature Age Employment commenced in July 2018 and will help educate employers of the benefits of recognising the skills of older workers and retaining them.

Further reducing the gender gap in labour-force participation

Overall female labour-force participation in Australia has risen significantly in recent decades, reducing the gap with male participation. Nevertheless, the prime-age female employment rate in Australia ranks in the lower third of OECD countries and a high proportion of prime-age women work part-time (Figure 1.29). In Australia, employment rates of women with children are considerably lower than those of prime-aged women (aged 25-54 years) without a child (Figure 1.30). Furthermore, even when in employment, they work comparatively few hours. Among partnered working mothers (aged 25-45 years) 45% work part-time, and four-fifths of them cite family reasons as the main reason for doing so. The average usual weekly hours of partnered mothers working part-time are less than 20 hours (Figure 1.31), the second lowest number in the OECD (OECD, 2017c).

Moreover, the labour-force participation of lone parents, who account for over a tenth of Australian households, is particularly low. Australia’s lone-mother employment rate is the third-lowest in the OECD (Figure 1.32). Furthermore, lone parent households are at significantly higher risk of living in poverty, even when employed (Sila and Dugain, 2018b).
Figure 29. Female employment rate is low and many work part-time

A. Employment rate for prime-age (25-54 years) women

B. Prime-age (25-54 years) women part time employment

Source: OECD Labour force statistics database.

Figure 30. Motherhood has a strong impact on labour market participation

Employment rates for women (25-54 years old) with no children and at least one child aged 0-14 years, 2014

Note: OECD is an unweighted average across the OECD countries in each panel. a) For Canada, children aged between 0-15 and 0-17 for the United States. b) Data for Denmark and Finland refer to 2012, and to 2013 for Chile, Germany and Turkey.

Source: OECD Family database www.oecd.org/els/family/database.htm

StatLink 2 https://doi.org/10.1787/888938838909
Female labour-force participation varies across countries because of differences in individual characteristics but also due to institutional frameworks and policies in a range of policy areas. These include public childcare support, including cash benefits (e.g. childcare subsidies), public in-kind services (e.g. public provision of childcare and out-of-school-hours care) and fiscal support (e.g. tax advantages for paid childcare services). In Australia, public spending on family benefits is concentrated on cash payments, notably via means-tested support for families in meeting the costs of children and in fee subsidies for childcare.

As pointed out above, high marginal tax rates generated by benefit tapering are an inherent challenge in policy design. To the extent that women are the lone earner or “second earner” in a household, high marginal tax rates likely play a role in lower female participation. Participation incentives in the tax and transfer system should ensure that there are clear benefits of work particularly for low income earners and those with primary care responsibilities. Work on tax and transfer reform in recent years suggests that there is scope for improving participation incentives by streamlining means testing across the income support and family payments systems. As the 2014 Survey points out, these tapering issues reinforce the case for further simplification of the tax-benefit system.

**Figure 31. Partnered mothers work very short hours**

Average usual weekly hours of partnered mothers working part-time, aged 25 to 45, with at least one child, 2012

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<tr>
<td>SWE</td>
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*Note: Usual working hours of the employed for European countries, Australia, Canada and the United States, and actual hours worked for Chile and Mexico. Data refer to total hours worked in all jobs, except for Chile and Canada where only hours worked in the main job are considered.*

a) For European countries and Chile, the distinction between part-time and full-time employment is self-defined – i.e. based on respondents’ own perceptions of whether they are in part-time or full-time employment. Part-time status based on weekly working hours below 30 for Australia, Canada and Mexico and less than 35 hours for United States.

b) Data refer to 2011 for Canada, to 2013 for Chile and to 2014 for Australia, Mexico and the United States.

*Source: OECD Connecting People with Jobs: Key Issues for Raising Labour Market Participation in Australia.*

Recent reforms to childcare support, in part, reflect an effort to address the marginal-tax issue. From July 2018 onwards the single means-tested Child Care Subsidy is replacing previous two measures (the Child Care Benefit and Child Care Rebate). This move follows recommendations of the Productivity Commission (2014a), and aims to increase and better
target support. The Productivity Commission (2014a) estimated that the reform’s impact on workforce participation would probably only be small. This underscores the need for ongoing attention to minimising negative impacts from benefit tapering.

The Child Care Subsidy covers up to 85% of families’ childcare fees, depending on income, up to an hourly cap and with an upper annual cap for families earning more than AUD 187 000. Eligibility criteria include that the family satisfies an activity test, with the hours of subsidised care depending on the hours spent in work, training, study or other recognised activities such as volunteering. Recognising that children from non-working families can be more vulnerable and can benefit more from ECEC, low-income families who do not meet the activity test will be subsidised for up to 24 hours of childcare each fortnight. In addition, the Child Care Safety Net programme provides targeted support to disadvantaged or vulnerable families who encounter barriers to accessing regular childcare. This is important as families in disadvantaged socio-economic areas generally have fewer and lower quality early childhood education and care services available in their area (Pascoe and Brennan, 2017).

**Figure 32. Employment rates of lone mothers in Australia are among the lowest in the OECD**

Employment rates (%) for women (15-64 year olds) with at least one child aged 0-14, by partnership status

![Graph](image_url)


*StatLink https://doi.org/10.1787/888933883947*

Lone parents - or the principal carer in couple families – where the youngest child is under six years old are subject to much lighter mutual obligations to be eligible for income support, most notably they are not required to participate in the employment services system. They can take-up support services from the contracted employment service providers as “volunteers”, but the services they receive are limited in comparison to jobseekers with older children that are required to participate. Those volunteering receive time-limited services of up to six months helping them understand and navigate the labour market and write a CV, or referring them to suitable vacancies. Provider fees for such volunteers are rather low, as they only attract fees of work-ready jobseekers. Once the youngest child turns six, mutual obligation requirements kick in (unless they are granted an exemption) and amount to about half of the hours required for other jobseekers on income support. However, they may not be required to attend any activity outside of their
home during the school holidays, where appropriate care and supervision of their children is not available. Once the youngest child turns eight, lone parents are no longer eligible for the Parenting Payment but instead may be eligible for other payments, generally the Newstart Allowance, which pays out about 20% less than the Parenting Payment.

Following the Welfare to Work reforms of 2006, lone-mother employment rates continued rising but then stagnated in the wake of the global financial crisis. In contrast, employment rates of partnered mothers continued to grow over the same period. The analysis in OECD (2017c) shows that many lone parents out of the labour market face a range of employment barriers including low education or skills, long-standing physical or mental health conditions and a lack of work experience. This suggests that additional measures are needed to achieve a lasting increase in lone parent labour market participation.

A recently introduced programme (ParentsNext), initially run as a pilot in ten local government areas and expanded to all non-remote areas as of July 2018, aims to address some of these issues through providing services that assist parents to plan and prepare for employment. Parents with children under age six and who had no paid employment in the last six months can participate on a voluntary basis, but for some recipients of the Parenting Payment participation is mandatory. ParentsNext is delivered through contracted providers, some of which also deliver jobactive services. Participating parents are required to attend six-monthly appointments with their provider, sign a Participation Plan and engage in activities that help them prepare for employment (education and training measures, improving skills, information on and help with childcare assistance).

A more comprehensive support to lone parents would require additional counselling, career guidance and (vocational) training as well as support to find solutions to reconcile work and childcare. As such support usually goes beyond the scope of employment services, Germany, for instance, has been strengthening support networks for lone parents (OECD, 2017c). Furthermore, in comparison to other OECD countries, Australia’s work test for lone parents remains limited in scope. Many countries apply a full-time work test when the youngest child turns three, or even earlier, while at the same time out-of-pocket childcare costs tend to be relatively low. Changes to participation requirements in Australia could therefore include introducing a work test early on and even introducing full-time work requirements for lone (and partnered principal carer) parents with older children.

**Raising excellence and equity in education and skills**

As discussed above, technological change, globalisation and demographic change are shifting the demand for skills and type of jobs that workers do. In the future, workers may have to change employers and jobs multiple times over their life-time, and renew their skills. Those that struggle with such adjustment risk being left behind, raising the prospect of increased inequality and poverty. Education and training policy can play a key role in limiting this risk, principally by giving greater emphasis on general and adaptable skills so that individuals can more easily transition between different types of work. With this in mind, policy makers should ensure that education, including early education, equips individuals with solid literacy, numeracy, problem-solving abilities but also basic ICT skills and soft skills. As many of these latter skills are acquired outside school and through work, accessibility of work-based learning opportunities will become increasingly important. To ensure that everyone succeeds, particular attention should be paid also to the most disadvantaged groups who often lag behind in skill acquisition.
Australia has a comparatively educated and skilled population. Tertiary-education attainment among the working-age population is one of the highest among OECD countries (Figure 1.33). About half of 20-year-olds are enrolled in tertiary education. Programme for International Student Assessment (PISA) results - that report competencies of 15-year old across countries - point to well above average results in reading, numeracy and science proficiency (Figure 1.34). According to the PIAAC Survey of adult skills, adults in Australia are also highly competent in international comparison. Moreover, adults across all age groups have strong computer and ICT skills (Figure 1.35) - which bodes well for further digitalisation.

**Figure 33. Australia has highly educated population**

Tertiary educational attainment 25-64 year olds (%), 2017

![Bar chart showing tertiary educational attainment 25-64 year olds in Australia and other countries](image-url)

*Source: OECD Education at glance database.*

StatLink: [https://doi.org/10.1787/88893883966](https://doi.org/10.1787/88893883966)

Also good news is that Australia has a high percentage of adults participating in some form of education and training (Figure 1.36). Adult learning plays an important role in acquiring new knowledge and skills, in particular the increasingly important information processing skills, and helps adapting to change. In addition, according to PIAAC data, jobs and working environments in Australia give plenty of opportunities for learning, including for those with low skills (Figure 1.37). The workplace is therefore an important and strong element of the skills system in Australia (OECD, 2017e).

Nevertheless, Australia’s education system faces a number of challenges. Performance on a number of fronts has declined or remained unchanged despite rising expenditure on education (Figure 1.38). The performance of 15-year old students in PISA has fallen over the past 15 years (Figure 1.39), both in absolute scores achieved and in international rankings. Moreover, results from other surveys - such as Australia's National Assessment Program - Literacy and Numeracy (NAPLAN) that assesses skills of students at different ages, and Trends in International Mathematics and Science Study (TIMSS) - show little progress (Productivity Commission, 2017b). These trends are particularly worrying in the context of changing skill demands in the future as it suggests weakening average performance in competencies that are core to more flexible skill sets.
Figure 34. Australian 15-year olds are highly proficient

A. Average PISA scores


StatLink: https://doi.org/10.1787/888933883985
Figure 35. Adults in Australia have strong computer and ICT skills

Share of adults scoring at Level 2 or 3 in problem solving in technology-rich environments (PSTRE), by age group, %

Note: Data for the United Kingdom correspond to England and Northern Ireland. Data for Belgium correspond to the Flemish Community.

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Figure 36. The participation of adults in education and training is high

Adults’ participation in formal and/or non-formal education, by type (2012 or 2015)
Survey of Adult Skills (PIAAC), 25-64 year-olds


StatLink 2 https://doi.org/10.1787/888933884023
Figure 37. The workplace is a strong element of the skills system

How often low-skilled workers learn work related skills from co-workers and supervisors, %

Note: The white triangles stand for the % of low-skilled workers who report to never learn from others. Bars show the % of low-skilled workers reporting learning every day from colleagues.

Source: Building Skills for All in Australia. Policy Insights from the Survey of Adult Skills.

StatLink 2 https://doi.org/10.1787/888933884042

Figure 38. Expenditure on education has increased over the last decade

A. Expenditure per student growth
Constant prices, 2008-2014

B. Expenditure on educational institutions
From public and private sources

Source: OECD Education at a glance (tables B1.3 and B2.2).

StatLink 2 https://doi.org/10.1787/888933884061
Figure 39. Proficiency of Australian 15-year olds has declined over time

Note: The numbers beside the lines in the charts indicate the ranking of Australia, 1 being the country with the highest PISA score.

StatLink [https://doi.org/10.1787/888933884080](https://doi.org/10.1787/888933884080)

Australia could further close gaps in performance between high and low performing individuals. According to PISA results, disadvantaged students have close to three times higher probability of low performance in science proficiency than other students (Figure 1.40), higher than the OECD average. Likewise, according to PIAAC results, there is a large gap between the most proficient and least proficient adults in numeracy. While generally Australian students and adults score high on various tests, numeracy proficiency of adults is quite mediocre (OECD, 2017e). These gaps suggest workers may be particularly vulnerable in sectors where further advances in technology are raising the bar on mathematical and scientific competency even in low- to mid-range jobs.

Linked to the gaps in performance, there is evidence that equity in education, while a policy priority, has not improved and certain indicators point to worsening. From 2006 to 2015, the proportion of high achievers among disadvantaged students remained roughly constant, and the slope of the socioeconomic gradient (the impact that a socio-economic status of a student has on her science proficiency score) steepened (OECD, 2016f). Moreover, the divide between disadvantaged and non-disadvantaged students grows as they progress through school. Goss et al. (2016) estimate that the gap between students of parents with low education and students whose parents have a degree increases from being the equivalent of ten months behind in learning in Year 3 to being two and a half years behind by Year 9.
Figure 40. Disadvantaged students have much higher probability of low performance

Likelihood of low performance among disadvantaged students, relative to non-disadvantaged students

Note: A socio-economically disadvantaged student is a student in the bottom quarter of the distribution of the PISA index of economic, social and cultural status (ESCS) within his or her each country/economy.

Source: PISA 2015 Results (Volume I): Excellence and Equity in Education

StatLink 2 https://doi.org/10.1787/888933884099

Rapid expansion in tertiary education also represents a challenge. More people studying is broadly welcome but the growth in numbers and costs requires adjustments to the system of student support that was developed when student numbers were much smaller. Completion rates at universities have been slightly trending downwards since 2008, and as 40% more people go to university now than in 2008, the number of early leavers has grown substantially (Norton et al, 2018). With places at universities being increasingly available also to students with lower performance in secondary school - as measured by Australian Tertiary Admission Rank (ATAR) - these numbers may grow further, entailing costs to students and governments.

There are also signs that the labour market outcomes of recent tertiary graduates - both vocational education and training (VET) and higher education - have weakened. Based on the Department of Education and Training’s (DET) Graduate Outcomes Survey and Graduate Careers Australia Survey, the share of bachelor graduates in full-time work four months after graduation declined from 85% in 2008 to 72% in 2017. Over the same period, government-funded VET graduates saw their overall employment rates (full-time and part-time) decline from 82% to 74%. Similarly, the underemployment rate among graduates grew from 8.9% in 2008 to 19.7% in 2017 and is close to twice as high as for the economy overall, indicating that many bachelor graduates who work part-time, do not do so necessarily by choice (QILT, 2018; Productivity Commission, 2017b). This said, weakening employment outcomes can be partly explained by a less buoyant labour market in 2017 as compared to 2008. For example, employment outcomes of graduates have started improving since 2014.

Australia exhibits a significant skill mismatch. OECD (2018b) finds that over-qualification in Australia is above the OECD average, although it has to be noted that the ranking might be affected by the state of the economic cycle of each economy (Figure 1.41). Moreover, VET graduates tend to be better matched to their jobs than graduates from higher education.
While university graduates overall continue to record better labour market outcomes than VET graduates and those with no tertiary qualifications, Norton et al. (2018) argue that an increasing share of graduates are taking jobs that do not require a degree, and which often pay less than skilled trades occupations. The salary of mismatched workers tends to be lower than salaries of equally qualified but well-matched workers, and mismatch negatively impacts job satisfaction (OECD, 2018b). Norton et al. (2018) further argue that many part-time university students and students with low ATARs who face a high risk of non-completion in university could have been more successful if having enrolled in VET courses instead.

**Figure 41. Over-qualification is above the OECD average**

Incidence of qualification mismatch and field-of-study mismatch, % of workers who are mismatched

*Note:* Most recent year available for each country. Data for Australia are for 2016. Field-of-study mismatch is calculated for all countries at the 2-digit ISCO level. See OECD (2017), Getting Skills Right: Skills for Jobs Indicators for details on methodology.

*Source:* Skills for Jobs database 2017. Data for Australia come from the Australian Bureau of Statistics and are based on the two-digit ANZCO classification.

**Boosting access to early education further**

In addition to the role early childhood education and care services play in facilitating labour market participation by parents, there is increasing awareness of their role in children’s well-being and cognitive and social-emotional development, that also form a foundation for lifelong learning (OECD 2017f, 2017g, 2018c). The number of years spent in early childhood education and care is a strong predictor of the level of performance reached at later stages, both in and out of school. In the Australian context, it has been shown that early childhood education improves school readiness and lifts NAPLAN results and PISA scores (Pascoe and Brennan, 2017; Productivity Commission, 2014a). High quality early childhood education raises the likelihood of completing Year 12 and reduces the likelihood of repeating grades. Early education can also be positive for equity outcomes. Disadvantaged students who receive support to enter early education are shown to more likely break the intergenerational cycle of disadvantage (OECD, 2018c; Pascoe and Brennan, 2017).
Enrolment rates of Australian three-year olds in early childhood education are below the OECD average (Figure 1.42). Conversely, those of four-year-olds are slightly above the OECD average. Enrolments of four-year-olds have in fact surged recently, following reform that aimed at universal access; between 2005 and 2015 enrolment rate of four-year-olds rose by over 30 percentage points (OECD 2017f). In this section we focus on the education aspect of children from age 3 onwards, while the activation section above focuses more on the childcare aspect and parent labour participation.

State and territory governments are responsible for planning, regulating and delivering early childhood education and care, and provide part of the funding. It is however the federal government that provides bulk of the funding (around 80%), mostly as Child Care Benefit and Child Care Rebate (from July 2018 onwards a single means-tested Child Care Subsidy) to eligible families that use approved childcare services (Productivity Commission, 2018b).

Figure 42. Enrolment rates of Australian children in early childhood education

| Note: Early childhood educational development programmes = ISCED 01, pre-primary education = ISCED 02, primary education = ISCED 1. |
| Source: OECD Education at a glance database. |

In 2009, the National Early Childhood Development Strategy, via the Universal Access programme significantly increased federal funding to states and territories to support early childhood programmes for all children in the year before school (i.e. four-year olds). The programme operates through a series of National Partnership Agreements, and provides funding that is in addition to other family support and that goes toward 600 hours of preschool education per year (i.e. about 15 hours per week), delivered by qualified early childhood teachers. The 2009 reform also brought the National Quality Framework that aims to deliver an integrated and unified national quality and regulatory system for early childhood education and care, replacing separate state and territory licensing (Pascoe and Brennan, 2017).

Given the importance of early education these reforms are welcome. In particular, as universal access is not a guarantee for high-quality early childhood education (OECD, 2017g), efforts to ensure quality via the National Quality Framework are commendable. Australian governments should ensure continued adequate resourcing of these initiatives.
Various barriers can prevent vulnerable and disadvantaged children - the ones that can benefit the most - from attending early childhood education. Australia has quite a big gap in enrolment between disadvantaged and other children (Figure 1.43). Early education policy should therefore be designed to facilitate access. For disadvantaged children this could entail a better targeted subsidy, a more intensive service, provision of transportation, or programs to improve home learning environment. However, in many countries greater access to childcare has resulted in many disadvantaged children ending up in low quality childcare, exacerbating disadvantage (OECD, 2018c). Delivering education to disadvantaged children can be a challenge. In order to ensure quality, skilled and stable workforce and additional resources may be needed.

**Figure 43. Enrolment rates in early childhood education of disadvantaged students are much lower**

Percentage of 15-year-old students who attended early childhood education (ISCED 0) for two years and more, by socio-economic background (PISA 2015)

![Graph showing enrolment rates in early childhood education of disadvantaged students are much lower](https://doio/10.1787/888933884156)


**Raising excellence and equity in schools**

Primary and secondary education is where students, at least in principle, acquire the core competencies, such as basic reading, mathematics and science that are important to skill sets under technological change and globalisation. As seen above, the Australian schooling system provides good core skills to most students, but faces some major challenges. Students' performance in reading, numeracy and science proficiency has been declining over recent years, notably there is room to raise outcomes among low performers.

Implementation of a welcome major funding reform continues that aims to tilt resourcing towards schools with disadvantaged students. Following the "Gonski 1.0" review (Gonski et al., 2011), the government - under the Quality Schools package - will be gradually increasing the total funding and altering allocation formulae for federal-government grants to schools, notably with the inclusion of more socio-economic variables. Funding will be based on the Schooling Resource Standard (SRS), which comprises of a base funding amount for every student plus six additional loadings that provide extra funding for
disadvantage (loadings for disability, low English proficiency, Aboriginal and Torres Strait Islanders, socio-educational disadvantage, school location and school size).

Transition to the new system is gradual. Eventually, the federal government will contribute a consistent share of the SRS for each type of school by 2027 and its share of government–school funding will increase from an average of 17% of the SRS in 2017 to 20% in 2027 (states and territories are prime funders of these schools), and from an average of 76.1% of the SRS in 2017 to 80% in 2027 for non-government schools (where Commonwealth is the main public funder). Conditional on receiving the federal-government's increased contribution, state and territory governments will be required to deliver their prescribed share of public funding.

Further reform is planned that aims to lever quality improvement in education. Reform will be broadly based on proposals detailed in the Review to Achieve Educational Excellence in Australian Schools ("Gonski 2.0", Gonski et al., 2018). The review provides numerous recommendations with the aim to focus on delivering at least one year’s growth in terms of learning for every student every year – therefore focusing on learning progression, rather than on learning specific to a certain grade, year, and age.

Focus on individual learning progression can help ensure that high achievers learn to their full potential, while helping prevent disadvantaged students from lagging behind (Gonski et al., 2018). But a successful learning-progression approach requires thorough reform of the way students are taught and assessed, including more personalised learning and teaching, based on each child’s learning needs. In particular, disadvantaged and vulnerable students may require greater and specialised support (Goss et al., 2016).

Furthermore, to sustain continuous improvement, schools and teachers need access to valid and reliable evidence on what works. In this context, Australia could benefit from more and better education research to develop policy and practice. While it monitors outcomes and benchmarks performance reasonably well, data and evidence could be better used to identify and apply the most effective programmes, policies and education practices (Productivity Commission, 2016). Australia should establish an independent institution to coordinate, source and generate the development of a national research and evidence base to support more evidence-based decision making in school education (Gonski et al, 2018; Sonnemann and Goss, 2018). This institution would complement, rather than replace, the existing network of state government research bodies.

**Stabilising VET**

Vocational educational and training (VET) is critical for providing practical skills, and the sector needs to keep pace with the evolving skill demand under technological change and globalisation. VET is also important for providing skills to students who have not performed well in previous schooling and who are at higher risk of being left behind by change.

Australia's VET system provides training for entry level jobs through to highly technical occupations. It is a complex system that on the supply side comprises a wide variety of providers and courses, the latter ranging from single-subject units of competency to multi-year qualifications. On the demand side is a diverse group of students from widely ranging backgrounds, ages, educational expectations and needs.

Most of government funding to VET is provided by states and territories, who also oversee VET delivery. The Australian Skills Quality Authority (ASQA) accredits courses and regulates registered training organisations (RTOs) to ensure that quality standards are met.
Industry liaison (i.e. liaison with employers) is provided via the Australian Industry and Skills Committee (AISC). Australian governments channel financial support to individuals (as incentives, subsidies or government loans), employers (subsidies and incentive payments) and directly to providers for certain VET programmes (Productivity Commission, 2018c).

In recent years the VET sector has suffered large reputational damage following a major reform. The National Partnership Agreement on Skills Reform from 2012 opened the sector to a wider set of (private) providers, partly by expanding the VET sector's student loan system - VET FEE-HELP, which provides income contingent student loans, paid directly to the RTOs for VET qualifications at the level of diploma or above. The reform widened the range of eligible courses and institutions, with the aim of increasing accessibility, quality and responsiveness to the needs of students, employers and industry (Acil Allen Consulting, 2015). One goal was to provide competition for public providers – the Technical and Further Education (TAFE) institutes.

However, the reform backfired. While accessibility increased and some successful steps were taken to improve TAFEs operations (Acil Allen Consulting, 2015), the sector became characterised by rapidly rising student debt, high student non-completion rates, poor labour market outcomes for certain students, and fraudulent behaviour on the part of some training providers (Productivity Commission, 2017b). Between 2009 and 2015, the number of students accessing VET FEE-HELP jumped from 5 262 to 272 000 and the value of outstanding debt to students went from AUD 26 million to AUD 2.9 billion (Australian Government, 2017). Contrary to the objectives, the reform and consequent increase in enrolments was largely supply driven, not demand led and reflecting students and industry needs. In addition, there was an apparent lack of proper contract management and regulatory oversight (Acil Allen Consulting, 2015).

The federal government has taken steps to restore confidence and stability to the VET sector. In 2017 the VET Student Loans program replaced the VET FEE-HELP scheme, and includes stronger controls regarding who can offer courses funded by loans, stronger control on prescribing which courses are eligible, and loan caps per course and per student. The latter partly aims to prevent excessive pricing by providers as experienced under the VET FEE-HELP. The scheme endeavours to limit eligibility to courses that have high national priority, meet industry needs, contribute to addressing skills shortages and align with strong employment outcomes (Australian Government, 2017).

The authorities should continue to ensure regular review and monitoring of the VET Student Loans scheme, with particular attention to ensuring that courses eligible for loans (and subsidies) are relevant and of high quality. Furthermore, the regulatory framework and the functioning of the VET regulator ASQA could be strengthened following recommendations from the recent National Vocational Education and Training Regulator Act 2011 review (Braithwaite, 2018).

One risk of Australia's VET system is that training packages put too much focus on job-specific skills, and overlook the important role of transversal or foundation skills, like literacy, numeracy and digital skills. This may partly stem from industry's (otherwise welcome) prominent say in developing VET training. PIAAC data show that numeracy proficiency among adults in Australia represents a challenge (Figure 1.44), in particular among women. In light of this specific-skills bias, the OECD recommends ensuring VET providers are capable of providing basic skills (Building skills for all in Australia; OECD, 2017e). This capacity should be strengthened in particular for VET providers catering for students with weak school qualifications.
Figure 44. There is room to reduce the share of adults with low basic skills

Share of adults with low basic skills


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Challenges in rapidly expanding higher education

As in many countries, participation in tertiary education in Australia has expanded significantly in recent decades, reflecting not only a supply response to increasing skill requirements in the labour market, but also as a consumption-good experience as living standards rise. Demand for higher education has also been boosted in recent years by a switch to demand-driven federal funding support in 2012.

The demand-driven funding has been a success on many fronts. It has brought greater flexibility and responsiveness to student and labour market needs, as illustrated by a large shift towards health-care related courses in light of the increasing number of jobs in this area due to population aging. Furthermore, participation rose quickly among students from disadvantaged background (Norton, 2018).

But rapid expansion has also brought challenges. Large increase in higher education enrolments has contributed to falling completion rates, and challenges for funding and government loan support for students (see above). Employment outcomes for graduates have also weakened over the past decade, affected by the economic cycle. In an effort to contain costs, in 2018 the government froze bachelor degree tuition subsidy funding for two years and committed to link it to population growth and yet-to-be-determined additional criteria from 2020 onwards (Norton and Savage, 2018).

The Higher Education Loan Program (HELP) scheme might need adjustment, or the cost to taxpayers may rise excessively in the future. Outstanding HELP debt (for higher education and VET studies combined) increased from approximately AUD 12.4 billion in 2006 to over AUD 47.8 billion in 2016, and some projections indicate that the figure could be nearly AUD 200 billion by 2025 (Productivity Commission, 2017b). Largely due to a high repayment threshold (a level of income beyond which a debtor needs to start repaying the loan), a significant proportion of HELP debt will not be repaid. The Department of Education and Training (2017) estimates that as of 2016-17, 25% of new HELP debt was...
"doubtful". HELP's interest subsidy (debts are only indexed by inflation, as is usual for government loan schemes) also adds to the cost of the scheme.

In 2018 the parliament agreed to adjust HELP, including reduction of the initial repayment threshold to AUD 45,881 from 1 July 2019. However, further reform is needed to limit the long-run fiscal cost. Lowering the repayment threshold further, and collecting more of the loan every year from those who earn above the threshold could help. The initial repayment threshold remains above similar thresholds in the UK or New Zealand (Norton and Cherastidtham, 2018 and 2016), although Australia's repayment rates apply to total earnings rather than marginal earning as in the other jurisdictions. While the HELP programme is not considered a form of welfare and the intent is to get those who benefit from education to make a contribution, the generosity of the HELP programme is at odds with otherwise highly targeted and means-tested social policy in Australia. For example, many graduates who never reach the repayment threshold work part-time and live in households with combined income well above means-testing thresholds in other social programmes. Such arrangements may even introduce perverse incentives for part-time workers to refrain from working more hours, in order to avoid repaying the debt (Productivity Commission, 2017b). Lower generosity of the HELP system would therefore not necessarily compromise the education and social policy goals of the scheme. Besides, international experience shows that thresholds lower than proposed in Australia do not deter students from undertaking tertiary education (Norton and Cherastidtham, 2018 and 2016).

Domestic students generally attend university via a Commonwealth-supported place (CSP), for which the federal government provides a pre-determined subsidy for each student and places maximum limits on student contributions (the latter normally covered from the HELP loan system). The total amount (subsidy plus student contribution) varies by field of study to roughly reflect cost, but there is evidence that it is nevertheless well in excess of cost for some courses (Productivity Commission, 2017b). This generates surpluses which universities use to fund research. Cross-subsidisation creates strong incentives for universities to offer more places for prospective students in high-margin courses, which can result in oversupply of graduates in certain fields. A thorough review of the pricing structure of university teaching and transparency on the end use of funding could help to limit fiscal costs of university education. The Australian government has made some steps towards better understanding of the cost of teaching by discipline and improving accounting methods for universities. However, reducing cross-subsidies would decrease funding for research, which would need to be offset by other policies, if needed.

**Better information for decision making in education**

High quality information (data and analysis) on current and future labour market demand, trends and earning potential can help governments as well as students in making choices, and can help tune public funding to labour-market developments. This can help the education sector keep up to speed with shifts in skill demand amid technological change and globalisation.

As suggested in the OECD's Getting Skills Right: Australia, (OECD, 2018b), skill assessment and anticipation (SAA) exercises help policy makers better understand skill imbalances and their causes. Generally, Australia's SAA system is well developed and a wide variety of exercises are carried out. The system could nevertheless benefit from some improvement. Getting Skills Right suggests:
• More regular forecasting of future skill needs (every 2 to 3 years) rather than the ad hoc basis so far. This would help better identify emerging labour market imbalances in the longer-term (say, a 10-year time span).

• More sharing of knowledge and SAA methodologies between states and territories, national government, and between industry reference committees. For example, the state-level exercises to determine which VET qualifications merit subsidies, as well as the Industry Skill Forecasts, vary widely in their methodologies.

• More analysis of skill needs in remote and rural regions.

• More focus on skills in SAA exercises, which at present tend to focus excessively on specific occupations or qualifications.

Incomplete information and policy bias may prompt many students to enrol in higher education instead of VET. In Australia, prospective students could have better information about risks and costs of undertaking tertiary, and in particular higher education. Although labour market outcomes are generally better for bachelor graduates compared to VET graduates, many part-time higher education students or those with low success in prior education would probably be better off choosing VET education, as they face a high risk on non-completion in higher education. But they may have decided for higher education due to incomplete information (Norton et al., 2018). There seems to be a policy bias towards higher education; higher education study does not impose any upfront fees on students, as tuition fees can be fully covered with HELP student loans. In contrast, in many cases a VET student needs to pay some of the money up front.

There is also room for improving information on employment prospects and linking it to education choices of students. In Australia there are several websites that provide information about careers and education pathways, and their employment outcomes. For higher education, the Quality Indicators for Learning and Teaching (QILT) website enables comparisons of the quality of higher education institutions in terms of graduate satisfaction and employment outcomes. For VET, the website MySkills is a national directory of vocational education and training providers and courses, offering information on average course fees, course length, subsidy information, and employment outcomes by VET qualification. Furthermore, the Department of Jobs and Small Business (DJSB) also disseminates labour market information about occupations through their Job Outlook and Labour Market Information Portal, and several states also have their own career websites. Evidence however shows that, despite having access to relevant information, young people can suffer from “information overload” and demonstrate lack of knowledge about their career options (OECD, 2018b).

Australia would benefit from centralising existing labour market information and data into a single online platform, as suggested in OECD’s Getting Skills Right: Australia (OECD, 2018b). New Zealand’s careers website provides a good example (OECD, 2018b). For higher education, the information provided to users should include personalised information about the risk of not completing a degree and give advice on how to reduce this risk (Norton et al., 2018).

In schools there is evidence that in Australia career guidance counsellors would benefit from more regularly updating their knowledge of the labour market by consulting SAA information. A high share of high school students report that they do not find advice very useful, moreover, reportedly, information about higher education courses is given higher priority than VET courses (OECD, 2018b).
Harnessing digital technologies for education

Digital technologies are creating new opportunities for skill development, potentially reducing time and space barriers, and facilitating personalised and collaborative learning. This has potential for smoothing adjustment amid shifting demand for skills, for instance by making the acquisition of new skills less time consuming and more effective. Massive Online Open Courses (MOOCs) and Open Educational Resources (OER) modify learning methods and give access to quality resources to a larger population over more flexible hours (OECD, 2016g).

Potential for remote communities

Scope for using digital technology in education has particular potential for Australia's numerous remote communities, many of which face multiple socio-economic challenges. Distance education has been available in Australia for around 70 years or so, through the Alice Springs School of the Air and the University of New England. These and other institutions are already pursuing the opportunities that digital technology offers. For example, the Open Access College in South Australia offers school education to those unable to attend a local school or access a curriculum (or course) not available in their school. Innovative methods include: telephone or online sessions with individuals or small groups, materials for group or individual work via online integrated learning programs, personalised learning materials, but also face to face workshops, visits from teachers and camps and excursions (OECD, 2016g).

Approaches being used for remote communities in Canada suggest further ways forward. The University of Saskatchewan’s College of Nursing in Northern Canada provides an example of higher education that reaches groups who would be otherwise unserved - Indigenous students who are predominantly located in remote areas. The College uses a Learn Where You Live approach, using Remote Presence (RP) technologies, the College provides students with access to highly qualified staff. This model could be used more extensively across Australia for students with the need for distance learning, and especially to reach out to remote and/or disadvantaged communities.

Overcoming barriers to digital-technology solutions more generally

As in other countries more general use of innovative education tools, notably MOOCs, remains fairly limited, despite their advantages on several fronts. MOOCs can be less expensive than traditional training, they allow learners to go through the materials at their own pace and lastly, online testing and certificates enable demonstration of the acquisition of skills. In Australia online education - by providers such as Coursera and EdX - has been expanding and mainly targets continuing education and professional development. Companies are teaming up with providers to provide training and universities are beginning to engage too. For instance, the Australian National University has partnered with EdX to offer micro-masters (Productivity Commission, 2017b). However, overall the number of courses and students remains small.

Barriers to using MOOCs and similar approaches include concerns about the quality of the education provided and a lack of recognition for learning outcomes (OECD, 2016g). As proposed by the Productivity commission (2017b), the federal government should develop a framework to facilitate the independent accreditation of skills obtained through any learning method. Existing institutional infrastructure could be used when relevant, as for example the Tertiary Education Quality and Standards Agency (TEQSA) for university-level qualifications.
Strengthening adaptability to globalisation and technological change in metropolitan areas

Metropolitan areas are typically where the impacts of globalisation and technological change are widely felt, chiefly because a large share of the population lives and works in them. Australia is no exception. Metropolitan areas are home to a very substantial share of their respective state populations and the country’s population as a whole. Table 1.1 and Figure 1.45 illustrate this for the five largest areas, which are centred on Sydney, Melbourne, Brisbane, Perth and Adelaide.

Australia's metropolitan focus has advantages for coping with socio-economic risks from structural change as it implies labour markets are relatively deep. This facilitates, for instance, the shift from routinised to non-routinised employment, and helps access to services for potential users of welfare and employment services, and reskilling. Furthermore, a metropolitan focus has advantages for harnessing change as it helps business clustering and positive network effects – which, as Silicon Valley and similar centres of activity illustrate, remain important.

Table 1. Australia's principal metropolitan areas

<table>
<thead>
<tr>
<th>Metropolitan area</th>
<th>Definitions generally used for administrative and governance purposes</th>
<th>Population...</th>
<th>...as % of</th>
<th>...as % of</th>
<th>2006-16 population % growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greater Sydney</td>
<td>A geographic area comprising 35 local councils covering about 12 000 square kilometres.</td>
<td>5.0</td>
<td>65</td>
<td>21</td>
<td>17.2</td>
</tr>
<tr>
<td>Melbourne metropolitan region</td>
<td>Generally considered as comprising an area comprising 31 local governments.</td>
<td>4.7</td>
<td>76</td>
<td>20</td>
<td>22.5</td>
</tr>
<tr>
<td>Brisbane metropolitan area</td>
<td>A large proportion of the metropolitan area is governed by the City of Brisbane – Australia’s largest local government. Four other local governments and part of a fifth are also generally considered as part of the metropolitan area.</td>
<td>2.3</td>
<td>49</td>
<td>10</td>
<td>25.6</td>
</tr>
<tr>
<td>Perth metropolitan area</td>
<td>Generally considered to be an area comprising 30 local governments, with wider definitions including additional local governments.</td>
<td>2.0</td>
<td>79</td>
<td>8</td>
<td>38.3</td>
</tr>
<tr>
<td>Adelaide metropolitan area</td>
<td>Generally considered to be an area comprising 19 local governments.</td>
<td>1.3</td>
<td>77</td>
<td>5</td>
<td>12.7</td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td>15.5</td>
<td>-</td>
<td>64</td>
<td>22.3</td>
</tr>
</tbody>
</table>

Note: The population data are based on Greater Capital City Statistical Areas developed by the Australian Bureau of Statistics.

Source: Population data are from Australian Bureau of Statistics using their Greater Capital City.

Rapid population growth, notably in the urban conurbations centred on Melbourne and Sydney, has put stresses on infrastructure, which in turn added impetus to planning and reform. In particular, road congestion has become a prominent issue (Figure 1.46). Rapid population growth has also underscored the issues generated by low-density housing, which remains dominant in Australia’s metropolitan areas (Figure 1.47). There has been progress on this front, but there is scope for further gains from making Australia’s cities more compact (“densification”).

The following sections consider governance, land-use, infrastructure, transport and housing affordability issues from a metropolitan perspective. This is not to deny that these issues, and others, are not relevant for rural areas in the context of adjustment to globalisation and technological change. Indeed, the preceding sections on education have highlighted that
new technologies are providing new opportunity for distance learning, which is highly relevant for Australia’s rural communities. However comprehensive coverage of the opportunities and challenges of globalisation and technological change for rural areas is beyond the scope of this review.

**Governance: strengthening direction and efficiency**

As elsewhere, Australia's large urban conurbations face the challenge of making policy progress in a multi-government setting. For many urban issues, all three levels of government, national, state and local, have interests and powers to influence outcomes. Though state governments have the core responsibilities in urban issues (Table 1.2), national government has considerable influence, principally through funding, and local governments have powers too, notably in planning.

**Figure 45. Australia’s metropolitan areas account for a large share of state populations**

**Source:** ABS.

**StatLink**  [https://doi.org/10.1787/888933884194](https://doi.org/10.1787/888933884194)
Figure 46. Congestion is reducing average traffic speed

Average travel speed in Melbourne by financial year
Freeways, Inner zones


StatLink 2 https://doi.org/10.1787/888933884213

Figure 47. Population density in metropolitan areas remains comparatively low

Population density of the city area (persons per km²), 2014

Source: OECD Metropolitan areas statistics.

StatLink 2 https://doi.org/10.1787/888933884232
Table 2. Government responsibilities across selected urban issues

<table>
<thead>
<tr>
<th></th>
<th>Federal</th>
<th>State and Territory government</th>
<th>Local Government*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning</td>
<td>Top-level guidance (notably via Infrastructure Australia)</td>
<td>Planning laws and zoning systems, generally lead urban planning strategy</td>
<td>Powers to influence zoning and impose additional regulation</td>
</tr>
<tr>
<td>Transport</td>
<td>Contributions to financing state and local-government projects</td>
<td>Urban transport systems (road, rail, bus etc.) and related investment</td>
<td>Local roads</td>
</tr>
<tr>
<td>Vehicle standards</td>
<td></td>
<td>Vehicle licensing, road taxes</td>
<td></td>
</tr>
<tr>
<td>Waste management</td>
<td>Waste disposal</td>
<td>Waste collection</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>Water and sewerage, electricity and gas</td>
<td>Sports fields, playgrounds, parks</td>
<td></td>
</tr>
</tbody>
</table>

* Local government is not constitutionally defined in Australia, though the powers are generally similar across the States and Territories. Nomenclature varies, the most common is "Shire" (e.g. Shire of Peppermint Grove) or "City" (e.g. City of Randwick).

Australia's major urban centres do not generally have very large, metropolitan-scale, local authorities; most are under the jurisdiction of many local authorities, even in the central urban areas (Table 1.1). One exception is Queensland where Brisbane City Council governs much of the conurbation and is the largest local authority population-wise in Australia with around 1.1 million inhabitants according to the 2016 Census. In other metropolitan areas the state governments take a lead on most urban issues. This is a workable approach given that each state's economy and population is largely based on a single metropolitan area. Indeed, introducing jurisdictions to cover entire metropolitan areas could overly complicate governance, whereby a state could, in effect, end up with two governments, one for its metropolitan area and one for the rest of the state.

Welcome efforts to give urban development stronger direction in urban planning have been underway. For example, the government of New South Wales has plans for a three-centred urban conurbation (A Metropolis of Three Cities - The Greater Sydney Regional Plan), the Victorian government released the latest of its strategic planning documents for Melbourne in 2017 (Plan for Melbourne 2017-2015) and the Queensland government has recently updated its metropolitan-area plan (South East Queensland Regional Plan, 2017).

Some of Australia's metropolitan areas would benefit from local-government amalgamations, especially among small jurisdictions (Figure 1.48). There have been substantial consolidations in the past, for instance in Victoria in the mid-1990s. However, not every consolidation effort has succeeded. In the Perth metropolitan area an attempt to roughly halve the number of municipalities was abandoned in 2015 and consequently there remain some very small local governments (e.g. Peppermint Grove, population 1 600). Similarly, in 2017 the New South Wales government abandoned an attempt to reduce the state's 152 municipalities to 112. Failure to amalgamate does not mean, however, an absence of opportunity for policy action. There can still be scope to encourage more shared provision and decision making across local governments.
Figure 48. Some states still have small-scale local governments in urban areas

Estimated Resident Population by Local Government Areas, 2015

Note: the chart shows the population of local governments with at least 1000 persons per square kilometre. Data for Queensland is not shown due to the large role played by Brisbane City Council (population approximately 1.1 million) in the metropolitan area.
Source: ABS.

StatLink 2 https://doi.org/10.1787/888933884251

More effective land-use regulation

Adapting to change requires capacity to adapt metropolitan land-use to new circumstances. For instance, as mentioned above, further progress on densification is still needed to cope with rapid population growth and facilitate public transport.

Most land-use development in Australia is under the purview of planning authorities that are part of local government. State governments influence land use through zoning legislation that defines the categories of development that are allowable within each zone of a local-government's jurisdiction. However, it is typically local governments that decide how to allocate land under the zoning system and are permitted to add further development criteria, such as building-height restrictions.

The zoning systems have long been criticised for having too many categories and excessive prescription on allowable activities within each zone. The issue is widely acknowledged across state and territory governments and a range of efforts is underway to improve zoning, and planning more generally (Table 1.3). However, only Victoria has so far substantially decluttered its zoning system, with now only two business zones in the planning system.

Given the local authorities' powers in planning state-level zoning reform does not remove risk that planning fails to align well with wider community interests and strategic objectives. Conceivably, derestriction of state-level zoning could in fact raise this risk, giving local authorities more leeway to follow planning approaches that serve their own goals and not state-level strategy. This risk could be perhaps contained by state (or nationwide) legislation that limits use of "add-on" restrictions, such as proximity restrictions (location restrictions in national legislation on pharmacies are prominent example).
### Table 3. Recent planning reform initiatives

<table>
<thead>
<tr>
<th>Planning reform in recent years</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New South Wales</strong></td>
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<td></td>
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<tr>
<td><strong>Victoria</strong></td>
</tr>
<tr>
<td><strong>Queensland</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Western Australia</strong></td>
</tr>
<tr>
<td><strong>South Australia</strong></td>
</tr>
<tr>
<td><strong>Tasmania</strong></td>
</tr>
</tbody>
</table>

*Source: Productivity Commission, *Shifting the Dial: 5-year productivity review*, Section 4.6.*

**Improving decision-making processes for major infrastructure development**

A metropolitan area's capacity to adapt to change and its overall functionality and "shape" are strongly influenced by its infrastructure. In the Australian context the spatial pattern and capacity of major roads is particularly important. Ensuring good decision making for major new road infrastructure is therefore paramount. Most major infrastructure development in Australia is primarily driven by state governments but national government has considerable influence, principally through co-funding. As such, ensuring consistently good project decision making by both state and national-level policymakers is a primary objective of project-development processes. Urban transport infrastructure is probably the most prominent issue for most households and businesses (Infrastructure Australia, 2018).

Australia's project development processes at the technical level comprise national and state-level infrastructure agencies (Infrastructure Australia, Infrastructure Victoria, Infrastructure New South Wales, and so on). The agencies develop strategy and evaluate project proposals following structured assessment processes, although there are wide variations in the role and independence of these agencies. As elsewhere, the interplay between project proposals and infrastructure agencies is complex. Ideas for new major infrastructure have often been around for some time, with political support and technical evaluation evolving over time.

In common with many other countries, despite the checks and assessments provided by independent agencies, politics can overshadow economics in project selection. Biases in economic calculation to help projects pass approval processes look to be a potential problem in Australia. For instance, Terrill (2016) questions the cost estimates of Sydney's WestConnex project and Melbourne's West Gate Tunnel, both currently under construction. In addition, economic assessment may simply get overridden in the final decision to press ahead with projects. A prominent example was the Victorian Government's initiation of a major road project (the East West Link), despite unfavourable cost-benefit analysis. The project was later terminated but at considerable taxpayer expense as the provider was entitled to compensation.

Some strengthening of the infrastructure agencies has already been carried out. For instance, in recent years Infrastructure Australia (established 2008) has undergone changes in governance arrangements following a major legislative amendment in 2014 and the
introduction of a requirement for the agency to evaluate all infrastructure proposals seeking over AUD 100 million in federal government funding. Infrastructure Victoria's legislation was overhauled in 2015 (the Infrastructure Victoria Act, 2015), and included commitment to a 30-year strategic planning process.

Despite the progress in developing the infrastructure agencies, the cases of questionable decisions suggest further room to improve the infrastructure-agency system. The Productivity Commission’s 5-year productivity assessment, Shifting the Dial (Productivity Commission, 2017c), calls for more cost-benefit analysis and greater opportunity for public scrutiny of alternative proposals – and claims many recommendations from its 2014 public-infrastructure report still apply (Productivity Commission, 2014b). This latter report notably calls for a country-wide rule that public-investment proposals above AUS 50 million should be subject to a common cost-benefit analysis. Such nationwide ground rules may be a useful way ahead, helping inter-state consistency. Similarly, a recent proposal for incentive-based additional funding for state infrastructure looks a promising way of ensuring good development choices (Infrastructure Australia, 2018).

Technical aspects of economic assessment can be key in shaping the prioritisation of projects. For instance Australian governments have been applying a 7% discount rate to cost-benefit analysis and other calculations requiring discounting since 1989. A recent paper by the Grattan Institute (Terrill and Batrouney, 2018) argues that discount rates ought to vary with the cost of borrowing and differ according to risk—suggesting that, currently, discount rates on many projects ought to be lower than 7%. Meanwhile, others (e.g. Harrison 2010) argue against such fine tuning, making a case for retaining the current rate of discount (or close to it) but accompanying this with sensitivity testing around this value (Harrison recommends 3 to 10%).

Sound economic analysis ought to also apply to road maintenance. A report commissioned by Infrastructure Australia (GHD, 2015) underscores that the expansion of road networks in metropolitan areas means increased future maintenance commitments. The report underscores the need for improving whole-of-life asset management and long-term funding strategies, for instance.

**Urban transport: substantial challenges but also new solutions on the horizon**

Good urban transport facilitates labour markets in metropolitan areas, helping labour adapt to change by widening commuting possibilities. Road congestion is Australia's most prominent urban-transport issue. Even in Australia's largest cities car dependency remains high, in large part the legacy of a sprawling urban geography (Terrill, 2018). More and better public transport, the encouragement of walking and cycling, and further urban densification could bring car dependency down, particularly in inner suburbs. However, these solutions have limited scope in Australia's extensive outer suburbs. For instance a major new rail system under construction in Melbourne is expected to increase commuting by public transport for those living near the new stations but the overall impact on commuting across the Melbourne metropolitan area as a whole is expected to be small; by 2031 the new rail system is expected to increase public transport trips by 2% and reduce car trips by 0.5% (Terrill, 2018).

Investment in new or improved roads can be part of the solution – though the impact on congestion is often uncertain (see Box 1.2). This section focuses on three further avenues for reducing congestion and environmental impact in road use, and more generally improving the travel experience: road-use charging, electric-vehicle incentives and encouraging the development of autonomous vehicles.
Wider use of road-use charging could help alleviate congestion and air pollution

As in many other countries, there is scope for tackling congestion and environmental issues through wider use of road pricing and, more generally, closer linkage between road vehicle taxation and charging with use rather than ownership.

Box 2. Uncertainties in congestion impact from investing in roads

Congestion reduction from investment in new or improved roads can be difficult to achieve because of uncertainties in the response of road users to the new configuration of transport options that investment brings. For instance, road-widening can prompt a greater-than-expected response in usage, new roads can prove more popular than projected, congestion can develop on connecting roads, and so on. Furthermore, the full behavioural response can take time to develop - for instance where new roads are connected with new housing developments that have yet to be completed and occupied. Also, there are tricky conceptual issues - congestion can be defined in many ways and, logically, aiming for a road system with zero congestion may not be optimal. For an extensive discussion on urban road congestion management by the Australian authorities see Austroads (2009).

Australia does not have a network-wide road-use charging system for light vehicles. Progress towards a comprehensive road-use charging and vehicle taxation system is most advanced for heavy vehicles. Heavy vehicles (weighing more than 4.5 metric tonnes) are subject to both road-use and registration charges for use of the road network and governments are working to reform the current arrangements. The reform’s aim is to improve the economic outcomes of heavy vehicles by creating stronger links between the needs of users, the charges they pay and the investment of those charges back into road services.

To date, most road pricing for light vehicles in Australia comprises tolls on sections of motorway that have been built under build-operate-transfer (BOT) contracts with the private sector. Time-varying charges operate in some cases (for instance the Sydney Harbour Bridge and Tunnel). Wider use of time variation in existing tolls would be welcome but would not make full use of the scope for road-use charging. The limited coverage and profit orientation of the BOT toll roads means they do not represent a comprehensive system of road pricing focused on congestion and pollution issues. Indeed, tolls can create congestion through drivers finding alternative routes to avoid the expense.

Comprehensive schemes that target car use, for instance along the lines of London’s area charging model or GPS-based charging have not yet been introduced in Australia (and such schemes would be a state and territory government issue). As stressed in the 2012 OECD Survey (OECD, 2012), getting public acceptance for congestion charging can be a major hurdle. Recent research making the case for congestion charges includes a report by the Grattan Institute (Terrill, 2018) that analyses trip-time data. These underscore the considerable variation in congestion over the course of a day. For instance the report finds that in Sydney the average CBD-bound trip takes 70% longer at morning peak compared with the middle of the night and around 80% longer in Melbourne. Also, the principle company engaged in Australia’s BOT roads, Transurban, ran a congestion charge trial in which GPS responders were installed in 1400 vehicles with drivers able to choose different road-use charges using notional accounts (Transurban, 2016). In addition to recording
behavioural responses, the study surveyed participants’ preferences. Some results were encouraging, for instance 63% of participants said they were comfortable with cordon-charging after experiencing it.

Including urban congestion charging in a reform package on road transport taxation could be one way forward - helping gain public acceptance for them. For instance, urban congestion charging could be combined with the introduction of distance-based charging (using Global Navigation Satellite Systems, GNSS) with corresponding reduction in taxes and fees connected with vehicle ownership, notably the state-based annual vehicle registration fees (Table 1.4). From a fiscal perspective, new use-based revenue streams could also offset the ongoing decline in fuel-excise revenues which is likely to accelerate as the share of electric vehicles increases.

Table 4. Key taxes and charges relating to the ownership and use of vehicles

<table>
<thead>
<tr>
<th>Category of taxation or charge</th>
<th>Detail (level of government indicated in parentheses)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vehicle ownership—purchase</strong></td>
<td>Stamp duty (rates vary) (state)</td>
</tr>
<tr>
<td></td>
<td>Luxury Car Tax (LCT); 33% of the value of the car above a threshold amount (AUD 66 331 in 2018-19) (a higher threshold applies to more fuel efficient vehicles (includes electric vehicles) (AUD 75 526 in 2018-19). (federal)</td>
</tr>
<tr>
<td></td>
<td>Customs duty (federal)</td>
</tr>
<tr>
<td></td>
<td>Regular Goods and Services Tax also applies (10%). (federal collection with distribution to states)</td>
</tr>
<tr>
<td><strong>Vehicle ownership—regular taxes, fees and charges</strong></td>
<td>Annual state-based registration fees that vary according to a vehicle’s value and/or other characteristics (“Motor Vehicle Duty” or colloquially, “Rego”) (state)</td>
</tr>
<tr>
<td></td>
<td>Fringe benefits taxes are imposed on employers when company vehicles are used for private purposes by employees. Employers can choose one of two methods to measure the extent of the private use. (federal)</td>
</tr>
<tr>
<td><strong>Vehicle use</strong></td>
<td>Excise and GST on fuel. A common excise rate is applied to gasoline and diesel for vehicles (and applies to number of other hydrocarbon fuels). The excise is indexed to CPI with biannual adjustment. As of August 2018 the rate was AUD 0.412 per litre. Liquid Petroleum Gas (LPG) is much less taxed with a rate of AUD 0.134 per litre (as of August 2018) (federal)</td>
</tr>
<tr>
<td></td>
<td>Toll systems on some motorways but few charges on other sections of road (state)</td>
</tr>
<tr>
<td></td>
<td>State-managed parking levies (state)</td>
</tr>
</tbody>
</table>

From both a technical and policy-design perspective, co-ordination between state and federal governments on such reforms is important. Vehicle-related taxation comprises a mix of federal and state mechanisms – ideally reform should involve combined adjustment. Furthermore, co-ordination is important because, for instance, economies of scale and compatibility issues may suggest development of a nationwide GNSS platform that allows for the collection of both federal and state road-use charges.

Given systemic change in road-related taxes and charges will take time, politically and in implementation, practicable near-term adjustments to relieve congestion should be sought. Actions (largely based on those suggested in Terrill, 2018) could include:

- higher parking prices;
- wider gaps between peak and off-peak pricing in public transport;
- more time-variation in pricing on existing toll roads;
- improved public information on journey times, including delays on roads.
Electric-vehicle use

Electric-vehicle adoption can bring substantial benefits to urban areas by reducing particulate air and noise pollution, as well as contributing to greenhouse gas reduction (though the latter depends heavily on the fuel-base of electricity generation). However, take up in Australia has been comparatively low. According to one calculation (Whichcar, 2018), even including an estimate for Tesla sales (which has a policy of not reporting sales figures in Australia), only about 0.2% of new cars sold in 2017 were electric. This suggests that the financial incentives offered to date (Table 1.5), which are mainly in the form of state-level discounts on vehicle stamp duty or annual registration fees, have not had a huge impact on car purchase decisions. Australia's comparatively low gasoline and diesel prices (notably, excise duties are low in international comparison) also play a role. In addition, vehicle range is a more substantial issue in Australia compared with high-population-density countries. Metropolitan areas are extensive and the scale of long-distance journeys by road is large (for instance, Sydney to Melbourne, around 900km).

### Table 5. An overview of electric-vehicle policy in Australia

<table>
<thead>
<tr>
<th></th>
<th>ACT</th>
<th>NSW</th>
<th>NT</th>
<th>QLD</th>
<th>SA</th>
<th>TAS</th>
<th>VIC</th>
<th>WA</th>
<th>FED</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Uptake</strong></td>
<td></td>
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<td></td>
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<tr>
<td>EV purchases 2011-2016</td>
<td>125</td>
<td>843</td>
<td>12</td>
<td>541</td>
<td>805</td>
<td>56</td>
<td>1017</td>
<td>298</td>
<td>3697</td>
</tr>
<tr>
<td>EV sales per 10,000 vehicles (2016)</td>
<td>18</td>
<td>7</td>
<td>4</td>
<td>5</td>
<td>9</td>
<td>5</td>
<td>8</td>
<td>3</td>
<td>7</td>
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<tr>
<td><strong>Regulation</strong></td>
<td></td>
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<tr>
<td>Vehicle CO2 emissions standards</td>
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<td>O</td>
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<tr>
<td><strong>Financial incentives</strong></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Stamp duty, registration and tax discounts</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>O</td>
<td>✓</td>
<td>✓</td>
<td></td>
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<tr>
<td>Direct vehicle subsidy</td>
<td>O</td>
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<tr>
<td>Fleet incentive</td>
<td>O</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Changing infrastructure support</td>
<td>✓</td>
<td>O</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td><strong>Non-financial incentives</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Vehicle lane and parking privileges</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>O</td>
</tr>
<tr>
<td>Electric vehicle public transport trials</td>
<td>✓</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Government fleet incentives</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
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<tr>
<td>Information and education programmes</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

*Note: Policies that are in place are marked ✓, policies that are planned but not implemented are marked ✓*, policies under consideration are marked O. This table was compiled through a survey of Australia's state, territory and federal governments on their electric vehicle policies. The Commonwealth Government, the Australian Capital Territory, New South Wales, the Northern Territory, Queensland, South Australia, Tasmania and Victoria provided input. For Western Australia we undertook a desktop research study. Vehicle purchase numbers do not include Teslas. Source: ClimateWorks Australia and the Electric Vehicle Council, The State of Electric Vehicles, (June 2017), p.12.

To a degree, the holding off from substantial subsidy of electric vehicles or technological commitment to charging systems until technology matures has made sense in the Australian context. The range issue and the absence of any substantial domestic electric vehicle development or production have played a role. In addition, though undergoing reform, Australia's electricity production remains comparatively carbon intensive which means smaller climate-change returns to electric-vehicle adoption compared with low-emission generation. Urban air quality is also a less pressing issue than it is in many other countries. Nevertheless, federal and state governments should continue to develop policy in line with progress in electric-vehicle performance and cost, and decarbonisation of electricity generation.
Encouraging autonomous vehicles

As elsewhere, self-driving or fully driverless road vehicles could re-shape urban environments through providing flexibility to public and private transport and changing the economic geography of urban living - such as decisions on where to live in relation to work, schools etc. Extensive use of driverless trucks in some of Australia's mining operations has illustrated the potential for such technologies, albeit in a comparatively controlled environment (The Economist, 2017). As regards use on open roads, most states are actively encouraging autonomous vehicle trials, including through changes to legislation (see Table 1.6). These efforts are welcome, and reflect Australia’s efforts to further advance their readiness for autonomous vehicles. According to KPMG’s 2018 Autonomous Vehicles Readiness Index, Australia ranks 14th out of 20 countries. However, there has been some progress since this index was constructed. In particular federal and state transport ministers have agreed to update the action plan attached to a national policy, which draw together work on automated vehicle safety, trials, cybersecurity, road rules, insurance, data protection and infrastructure readiness.

Table 6. Selected initiatives supporting and trialing autonomous vehicles in Australia

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Selected detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal level</td>
<td>A roadmap for reform has been agreed that aims for the operation of conditionally automated vehicles before 2020 and fully automated vehicles by 2020</td>
</tr>
<tr>
<td>New South Wales</td>
<td>Legislation allowing automated vehicle trials passed 2017</td>
</tr>
<tr>
<td></td>
<td>Trial of driverless shuttle bus at Sydney Olympic Park</td>
</tr>
<tr>
<td>Victoria</td>
<td>Legislation allowing automated vehicles trials passed 2018</td>
</tr>
<tr>
<td></td>
<td>Grant programme to support development of vehicles with connected and automated technology</td>
</tr>
<tr>
<td></td>
<td>State government partnership with Bosch to develop a self-driving vehicle</td>
</tr>
<tr>
<td>Queensland</td>
<td>Co-operative and Automated Vehicle Initiative—aims to prepare for new technologies</td>
</tr>
<tr>
<td>Western Australia</td>
<td>Trials of electric-powered autonomous vehicles by the French company NAVYA</td>
</tr>
<tr>
<td>South Australia</td>
<td>Legislation encouraging autonomous vehicle trials passed 2016</td>
</tr>
</tbody>
</table>


Urban housing affordability

In urban areas the risk of being pushed into poverty and low quality living can be amplified by an absence of affordable housing. Lower-income households can be increasingly driven to the more distant and hard-to-access suburbs and satellite towns, narrowing access to jobs.

Australia's substantial house-price increases, and accompanying increase in rents, have contributed to a deepening and widening of the housing affordability issue. First there are deeper challenges for those traditionally vulnerable to access and cost difficulties (the long-term unemployed, single parents, poor pensioners, the homeless). Second, there are growing housing affordability challenges for those further up the income scale. The latter is important in the Australian context as home-ownership is a central aspiration of many households (influenced by favourable policy settings for ownership) and is also central to saving, wealth and retirement plans. Furthermore, home-ownership is an assumed norm in much of policy, for instance in policies on pensions and ageing.

There has been welcome breadth to Australia's policy initiatives to address the affordable housing issues. This is important as, for instance, a policy that only focuses on increasing
subsidies for home purchase can be counterproductive, prompting price increases rather than new homes. A Senate committee report on housing affordability in 2015 (Commonwealth of Australia, 2015) pushed for:

- Increasing provision and protection in the rental market, notably through: increasing the proportion of social housing in the total housing stock; investigating innovative financing models for affordable housing; and, strengthening of tenant rights.

- Improving home purchase affordability, notably through: phasing out conveyancing stamp duties; reducing up-front costs for installing utilities in new housing developments; and, measures to ensure land supply and changes to urban planning and zoning processes to support affordable housing.

- Stronger co-ordination and policy direction on affordable housing, notably through: strengthening of existing federal-state agreements (such as the National Affordable Housing Agreement); and, greater unity in policy strategy, including through the federal government taking a lead in formulating a long-term national affordable housing plan.

State governments have launched initiatives that echo the committee's multi-pronged approach. For instance the Victorian government launched "Homes for Victorians" in 2017 which envisages progress along similar lines to those advocated in the senate report, including some steps towards tenancy-legislation reform, increased funding for social housing, abolishing stamp duty and planning reform.

There has also been some federal-level policy action. The 2017-18 Budget announced several measures including assistance for first-time buyers (the First Home Super Saver Scheme) and new programmes to increase the supply of housing and reform of housing-related payments to the states and territories.

The ambition at both the state and federal level to address housing affordability is admirable. However, some measures entail risks, greater protection for tenants can aggravate affordable housing problems if it prompts owners to withdraw property for rent or become more selective in choosing tenants. Also, progress on some policy dimensions is inherently difficult. In particular, planning reform to increase housing supply can meet stiff opposition and phasing out stamp duty poses a fiscal challenge for states as it is a substantial source of revenue (though this could be offset through increasing land taxation). There is therefore a risk that advances will only be made in the more easily implementable support measures.

**Encouraging use of new technologies: the "Smart Cities Plan"**

Although there are pressing challenges for urban areas, new technologies are providing scope for tackling them. The small but growing share of electric vehicles, and advances in the development of autonomous vehicles are prominent examples (discussed above in the section on transportation). However the scope for utilising new technologies is wider than this. For example the City Futures Research Centre (University of New South Wales) is developing analytical and visualisation tools on various dimensions of urban environments (e.g. affordability). The wide range of potential applications of new technology to urban policy and environments has been recognised in the federal government's "Smart Cities Plan", which aims to provide greater federal-government support and steerage on developing and implementing technological solutions to urban problems. The Plan focuses on three pillars "Smart Investment", "Smart Policy" and "Smart Technology".
In concrete terms the Plan entails the following elements:

- A "City Deals" programme (similar in nature to that carried out in the United Kingdom) that provides extra federal support for pursuing a development strategy. As of July 2018, a number of deals were underway. For example in Townsville, Queensland, a deal has been struck that includes co-financing a sports stadium, rail link and port upgrade. In Launceston, Tasmania, the deal includes relocation of a university campus and a programme to revitalise the central-business district.

- "Smart Cities and Suburbs Programme": co-financing for individual technology-based projects to improve urban environments and promote development. A first round of approvals gave the green light to 52 projects, funded entailing a financial commitment by government of AUS 28.5 million and a commitment of AUD 40 million from other sources, such as local government, industry and research organisations. Most of the projects approved are small scale, with budgets of less than AUD 500 000, and involve the development of software solutions.

To assist these processes, and urban planning more generally, the Plan also includes establishment of a federal-level financing unit (the Infrastructure Financing Unit), an expert advisory group (the Cities Reference Group) and monitoring initiative (the National Cities Performance Framework).

Overall, the "Smart Cities" plan has much merit on principle. Also the relatively small budget allocation means that the fiscal cost is modest. However, even comparatively small projects ought to deliver value for money, so every effort should be made for the plan to succeed.
## Box 3. Recommendations

### Activation policies

**Key recommendations**

- Incentivise jobactive providers to achieve longer job retention, provide better quality training and on-the-job support.
- Focus further on lone-parents in terms of childcare availability and affordability, childcare benefit targeting, and career guidance and training.

**Other recommendations**

- Continue making support for displaced workers more comprehensive and covering all regions and sectors of the economy.
- Continue to work on reducing disincentives to employment, particularly among women.
- Introduce a mandatory early notification of collective dismissal by employers to Centrelink.

### Education and skills

**Key recommendations**

- Continue focus on disadvantaged students in early childhood education and schools.
- Improve VET education including by better basic-skills provision among providers and reduced policy bias in favour of university education.
- Provide better information for education choices including through a single platform with career information, education pathways and employment outcomes.

**Other recommendations**

#### Early Childhood Education and Care (ECEC)


#### Primary and Secondary education

- Continue rolling out the needs-based funding to schools under the Quality Schools package.
- Move towards a school system - teaching, curriculum, assessment - that focuses on delivering at least a year's learning-progress equivalent to every student every year, with a particular focus on disadvantaged students.
- Establish a national independent research institution to improve education evidence base.

#### Vocational Education and Training (VET)
• Ensure regular review and monitoring of the VET Student Loans programme, with particular attention to ensuring that courses eligible for loans (and subsidies) are of high quality and relevant.

• Strengthen the regulatory framework and the functioning of the VET regulator ASQA following recommendations from the “Braithwaite Review”.

**Tertiary education**

• Reduce the generosity of the HELP (income contingent student loans) scheme and review the pricing structure of university education for federally-supported places to better match with the cost of teaching across different courses.

**Improving information for better decision-making**

• Provide prospective students (of all ages) with relevant and up to date information of costs and risks involved in education pathways.

• Introduce more regular (2-3 years) skill assessment and anticipation (SAA) exercises to better preview skill demand and potential skill imbalances in the longer-term.

• Encourage knowledge sharing between states and territories, national government, and between industry reference committees to make the quality and methodology of SAA at sub-national levels more consistent and strengthen it for remote and rural regions.

**Digital technologies**

• Develop a framework to facilitate the independent accreditation of skills obtained through any learning method to enable recognition of learning acquired via online courses.

**Improving urban environments**

**Key recommendations**

• Improve infrastructure project selection further by raising the prominence of cost-benefit analysis and economic returns.

• Accompany accelerated road investment with more road charging, including urban congestion charging.

• Strengthen urban-area governance through greater leadership from federal and state initiatives in planning, and continued efforts to amalgamate small local authorities.

**Other recommendations**

• Simplify state zoning systems in land use regulation, consider limiting local-government powers for add-on restrictions, remove proximity restrictions that still feature in some retail sectors.

• Ensure advance on the tough issues in housing affordability, notably planning reforms to allow more high-density development and the phase out of stamp duty.
- Continue tapping into new-technology solutions to urban issues, including via the "Smart Cities plan".

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