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INCOME POVERTY OF HOUSEHOLDS IN AUSTRALIA: EVIDENCE FROM THE HILDA SURVEY

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Abstract / Résumé

Income poverty in Australia: evidence from the HILDA survey

This paper analyses relative income poverty in Australia of individuals aged 15 or more, based on the HILDA Survey data. Australia has above-average poverty rates among OECD countries, but poverty has decreased in the last 15 years. Certain groups are more at risk than others. People living alone and lone parents are at higher risk of poverty. Old people in Australia have a more than 30% chance of living in poverty, which is one of the highest in the OECD. Among those of working age, being employed significantly reduces the risk, while those out of the labour force and the unemployed are at much higher risk of poverty. Nevertheless, there is poverty also among people that work, typically casual workers and part-time workers. People with low education are also at risk. Those living alone and one-parent households face quite a high risk of poverty, even if they are employed. Indigenous Australians are almost twice as likely to be poor than the rest of Australians and they appear significantly poorer than the rest even after controlling for education, age, industry, skill and geographical remoteness, suggesting a range of socio-economic issues, including poor health and discrimination.

JEL Codes: D31, I3

Keywords: Australia, HILDA, household panel, poverty

This Working Paper relates to the 2018 OECD Economic Survey of Australia http://www.oecd.org/eco/surveys/economic-survey-australia.htm.

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Pauvreté monétaire en Australie : enseignements de l'enquête HILDA

Nous analysons dans ce document la pauvreté monétaire relative des personnes âgées de 15 ans ou plus en Australie, à partir des données de l'enquête sur les ménages, les revenus et la dynamique du marché du travail en Australie (HILDA, Household, Income and Labour Dynamics in Australia). Son taux de pauvreté est supérieur à la moyenne des pays de l'OCDE, mais il a reculé au cours des 15 dernières années. Certains groupes sont plus exposés que d'autres au risque de pauvreté, notamment les personnes vivant seules et les parents isolés. En Australie, la probabilité de se trouver en situation de pauvreté est supérieure à 30% pour les personnes âgées, soit une des plus élevées de la zone OCDE. Parmi les personnes d'âge actif, le fait d'avoir un emploi réduit sensiblement le risque de pauvreté, tandis que celui-ci est nettement plus fort pour les inactifs et les chômeurs. La pauvreté touche cependant également des actifs occupés, qui sont généralement des travailleurs occasionnels et à temps partiel. Les personnes ayant un faible niveau d'instruction sont aussi exposées. Les individus vivant seuls et les ménages monoparentaux sont exposés à un risque de pauvreté relativement élevé, même s'ils ont un emploi. Les Australiens autochtones se caractérisent par une probabilité d'être pauvres presque deux fois plus élevée que le reste de la population australienne, et ils semblent nettement plus pauvres, même une fois pris en compte le niveau d'études, l'âge, le secteur d'activité, le niveau de compétences et l'éloignement géographique, ce qui laisse entrevoir divers handicaps socioéconomiques, notamment des problèmes de santé et des phénomènes de discrimination.

Codes JEL : D31, I3

Mots clés : Australie ; HILDA ; Panel de ménages ; pauvreté

Ce document de travail est lié à l'*Étude économique de l'OCDE* de 2018 consacrée à l'Australie http://www.oecd.org/fr/eco/etudes/etude-economique-australie.htm.

Table of contents

Tables

Figures

Boxes

Income poverty in Australia: evidence from the HILDA survey

By Urban Sila & Valéry Dugain[1]

Introduction

1. Australia is a successful developed economy with high living standards. It has had an impressive track record of economic growth in recent decades, and, the 2008-9 global financial crisis affected it less adversely than most other OECD economies. Yet, not everyone has shared equally in this success. Quite a significant share of people live in poverty. This is detrimental from a social perspective and can have negative consequences for social cohesion. Furthermore, it detracts from the economy's productive potential and economic growth (OECD, 2015).

2. In this paper, and in line with income-poverty statistics commonly used in OECD work (OECD, 2008), we focus on relative poverty – specifically individuals who live in households whose income is less than half (or less than 60%) of median income. The analysis is based on data from the HILDA Survey.

3. The paper is structured as follows. We first explain methodology and then look at how Australia compares to other countries in terms of poverty and how poverty has evolved over time. The following section compares income sources of poor households to all households. Next, we analyse the risk of poverty across characteristics such as gender, age, household type, labour force status, country of birth, indigenous status and regions. Finally, we present results from a multivariate probit regression, where we control for all these characteristics simultaneously.

Notes on methodology

4. HILDA Survey is a household-based panel study that collects information about economic and personal well-being, labour market dynamics and family life across Australia. It has been conducted annually since 2001 (see Box 1). The data can be used to compute directly the measures of income poverty across characteristics at the individual and household level.

[1] Urban Sila is an economist in the Country Studies Branch of the OECD Economics Department. Valéry Dugain served as a consultant in the OECD Economics Department when research for the paper was done. For valuable comments and suggestions the authors would like to thank Philip Hemmings and Patrick Lenain (both from OECD Economics Department), Michael Förster and Herwig Immervoll (both from OECD Employment, Labour and Social Affairs Directorate), Jonathan Coppel and Josh Craig (both Productivity Commission). Editorial assistance from Stephanie Henry was also greatly appreciated.

5. As commonly done in related OECD work (for example, OECD, 2008), we focus on relative poverty. It captures the notion that preferences and norms in society on what is an acceptable standard of living - and the costs associated with it - change over time as incomes rise. Given that Australia has recorded an impressive growth in real incomes over the recent decades, absolute poverty has surely been greatly reduced, however the relative poverty threshold will have increased significantly.

6. We focus on poverty measures based on equivalised household disposable income. For the issues at hand, the household perspective is the most appropriate as this is the key economic and social unit where resources are pooled and where decisions are made. Following the methodology in the OECD Income Distribution Database (OECD, 2016) we keep the individual as a unit of observation, but we assign each individual an income that is equal to the total household income divided by the square root of the number of individuals (of all ages) in the household.

7. The poverty rate is calculated as the share of people who live below the poverty line, where poverty line is defined as 50% or 60% of the median equivalised household disposable income, all based on the HILDA data. It is important to mention that our approach - which is the same as in the OECD Income Distribution Database - uses disposable income as a base for computing poverty lines, without correction for housing costs. This can introduce bias if there are groups that are more likely to own their homes outright, such as the elderly, as they face lower housing costs. For these groups a given level of income allows a higher standard of living compared to others and therefore poverty rates can exaggerate their true economic disadvantage. ACOSS (2016) reports poverty rates before and after taking housing cost into account. Their conclusions from comparing risk of poverty across different groups are nevertheless similar to ours.

Box 1. HILDA Survey

The Household, Income and Labour Dynamics in Australia (HILDA) Survey is a household-based panel study, that started in 2001 and collects data on about 17 000 Australians each year. The data cover many aspects of life, including household and family relationships, child care, income and employment, education, expenditure, health and wellbeing, and other life events. At less frequent intervals the survey collects additional information on various topics, as for example on household wealth, which has been conducted every four years since the second wave in 2002.

As this is a panel data set, participants are surveyed every year and population weights are provided so that statistics computed from the data can represent estimates for the Australian population. For wave 1 of the survey, households were selected such that representativeness of the reference population was ensured. Children born or adopted in these households also become members of the sample. All members of the selected households count as members of the sample, although individual interviews are only conducted with those aged 15 years and over.

Shifts in population composition (for instance due to immigration) and sample attrition (e.g. participants dropping out due to refusal to participate or problems in locating them) make a sample less representative of the whole population over time. To correct for immigration, in wave 11, a general sample top-up was conducted which allowed immigrants who had arrived between 2001 and 2011 to enter the HILDA Survey sample. To correct for attrition, sample weights are changed each year to adjust for differences between the characteristics of the panel sample and the characteristics of the Australian population.

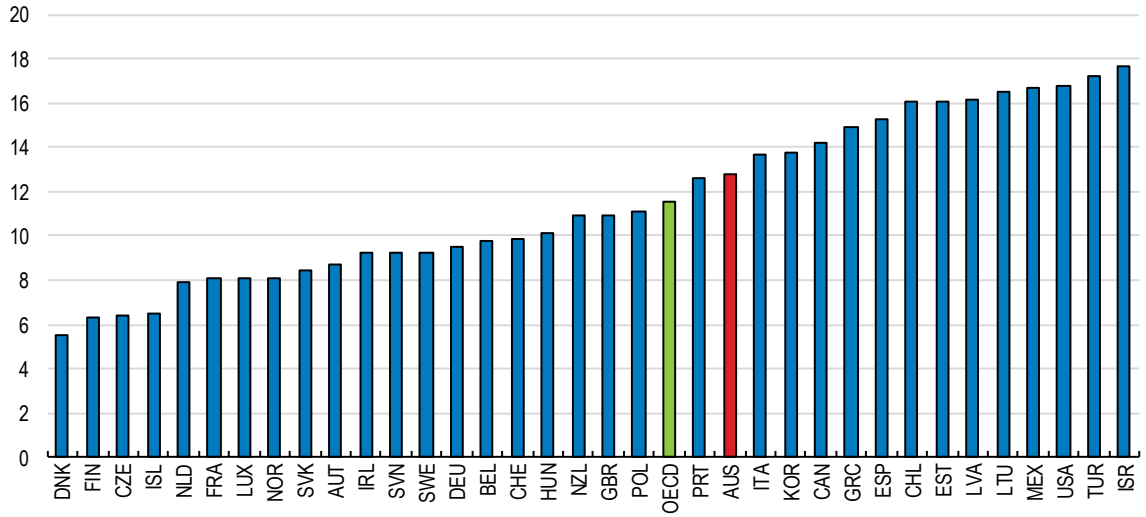
The HILDA Survey is funded by the Australian Government through the Department of Social Services. The Melbourne Institute is responsible for the design and management of the Survey. For more information visit http://melbourneinstitute.unimelb.edu.au/hilda.

Relative poverty in Australia is above average in OECD comparisons but has declined over time

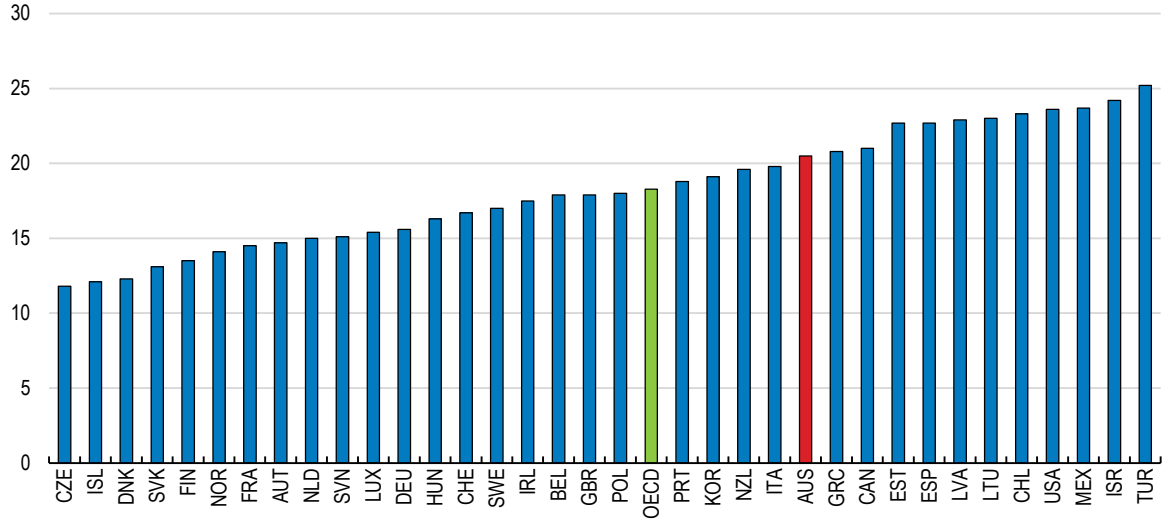
8. The share of people who live in relative income poverty is higher in Australia than on average in OECD countries, according to the OECD Income distribution and Poverty Database (Figure 1). About 13% percent of people are in poverty based on the 50% poverty threshold, and 20% based on the 60% threshold. In both cases the poverty rates are above the OECD average. Other evidence points in the same direction. Andrews and Thomas (2015) compute poverty and inequality measures for Australia to make them comparable with European statistics, and report that for the 2001-2013 period, Australia had higher poverty rates than the majority of comparison countries.

Figure 1. Poverty in Australia is above the OECD average

A. Poverty rate after taxes and transfers, Poverty line 50% (2015)



B. Poverty rate after taxes and transfers, Poverty line 60% (2015)

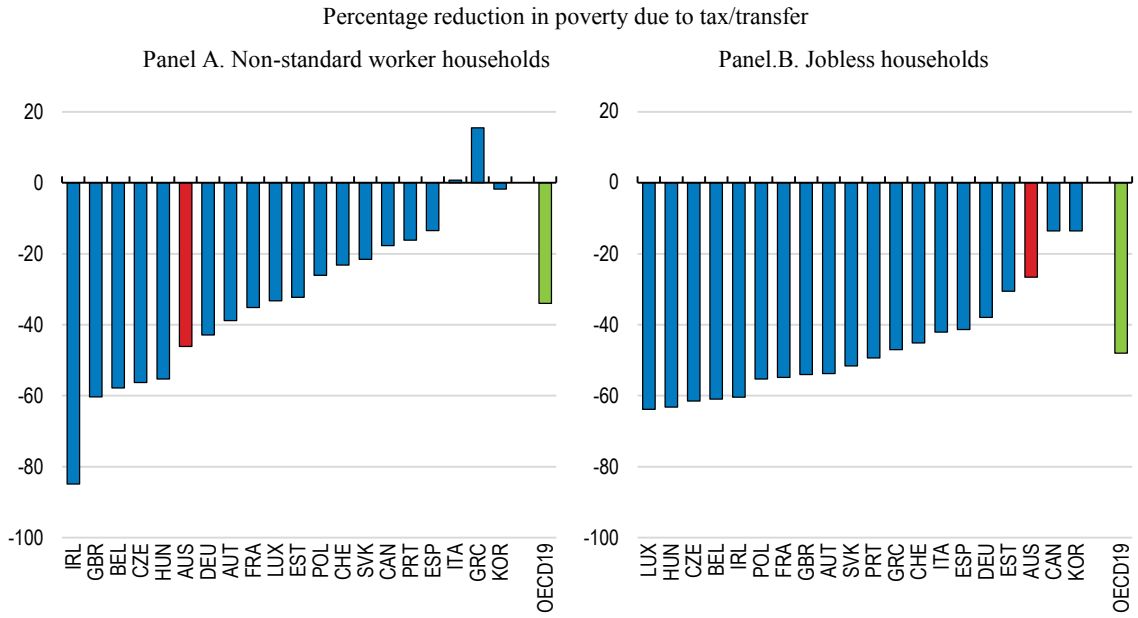


Note: The OECD value is the unweighted average of the displayed countries. 2014 data for Australia, Denmark, Germany, Hungary, Iceland, Ireland, Luxembourg, Mexico, New Zealand and Switzerland. 2016 data for Israel.
Source: OECD, Income Distribution and Poverty database.

9. The OECD's *In It Together, Why Less Inequality Benefits All* (OECD, 2015) computes the extent to which redistribution through taxes and benefits reduces poverty. The results are shown in Figure 2. For jobless households who have comparatively high risk of poverty in Australia, the tax and benefit system contributes relatively little to reducing their poverty (panel B). For non-standard worker households (temporary workers, part-time workers and self-employed) on the other hand, that are at relatively low risk of poverty in Australia (not shown), the tax and benefit system is quite effective in reducing their poverty further (panel A). This pattern is the reverse of what occurs across OECD

countries on average, where households with non-standard workers benefit significantly less from taxes and benefits in reducing their poverty, compared to jobless households.

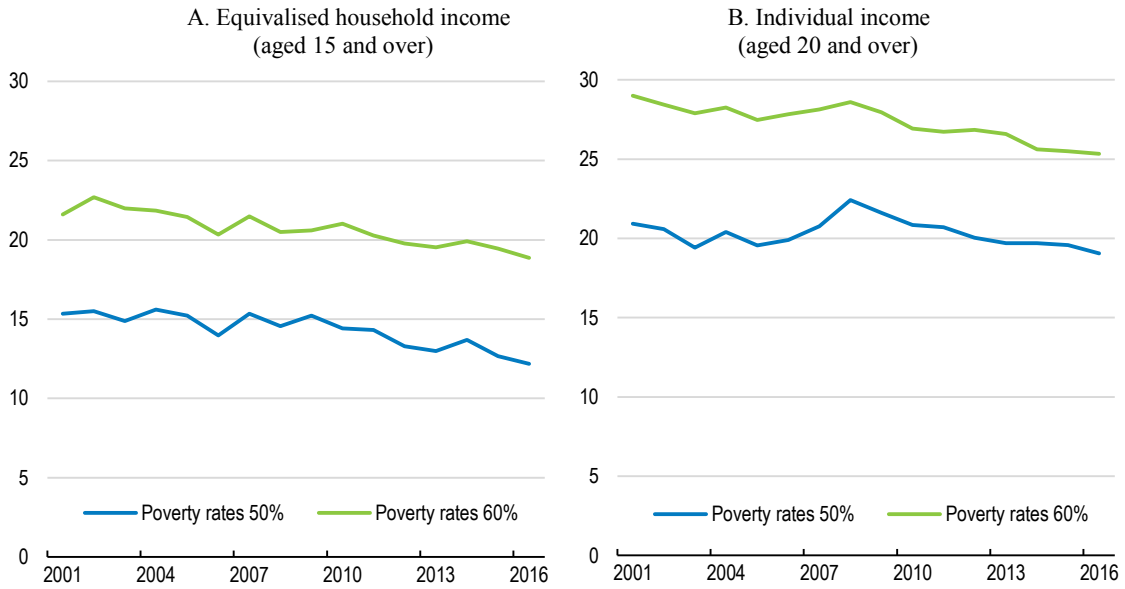
Figure 2. The impact of taxes and transfers on poverty reduction



Note: Non-standard workers include temporary workers, part-time workers and the self-employed. The poverty line is half of the median equivalised household income calculated for the entire population. Figures represent the difference between the poverty rate for disposable income and for market income in percentage points. For Korea market income refers to after tax before public social and government transfers and is not comparable with the other countries.
Source: OECD, In It Together, Why Less Inequality Benefits All (2015). Data obtained from European Union Statistics on Income and Living Conditions (EU-SILC, 2012), Household, Income and Labour Dynamics in Australia (HILDA, 2012), Korean Labor & Income Panel Study (KLIPS, 2009), Survey of Labour and Income Dynamics for Canada (SLID, 2010).

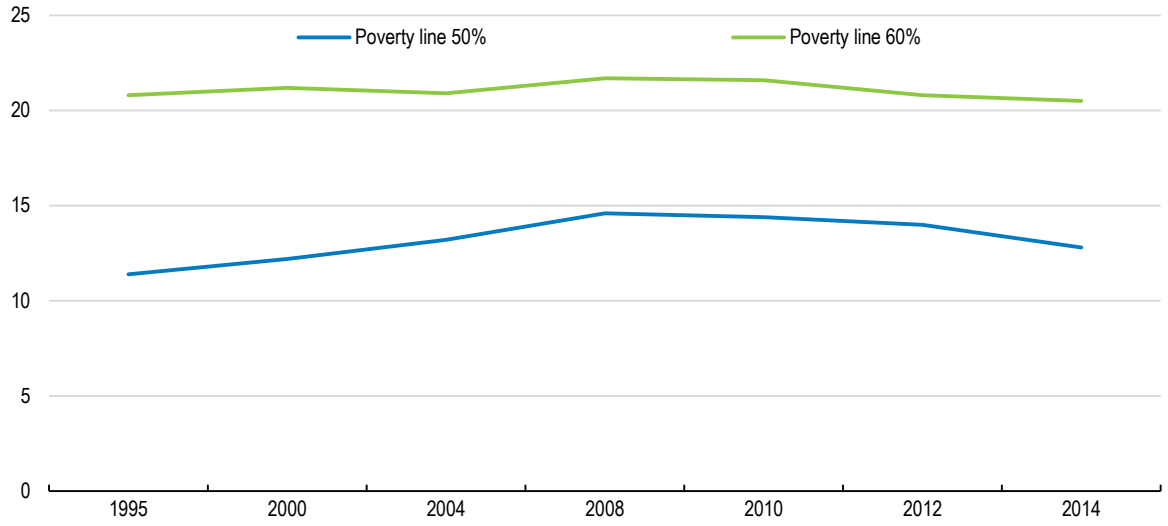
10. The poverty rate in Australia has decreased over the last 15 years, according to the HILDA data (Figure 3). For comparison, we show rates both based on personal income and on (equivalised) household income, and, as expected, poverty based on the household income is significantly lower. Poverty in Australia has been on a declining trend. The share of people living in households with income below 50% of the median household equivalent income went from 15.3% in 2001 to 12.2% in 2016 (Figure 3, panel A). The OECD Income distribution and Poverty database, on the other hand, gives a mixed message (Figure 4). The 60% poverty line shows roughly constant poverty rates, while 50% line shows first a rising trend and then a falling trend. The series however contains a methodological break in 2012 with the introduction of an updated measure of income, and is hence not fully comparable over time.

Figure 3. Poverty in Australia has decreased over time (based on HILDA Survey data)



Source: HILDA survey and OECD calculations.

Figure 4. Poverty rates over time, OECD data (break in the series)



Source: OECD, Income Distribution and Poverty database.

Main sources of income for poor households

11. Households that live in poverty differ in their sources of income from the rest of the population, in particular, deriving a much smaller share of income from wages and salaries, and with greater reliance on income support payments and, among pensioners, state pensions.

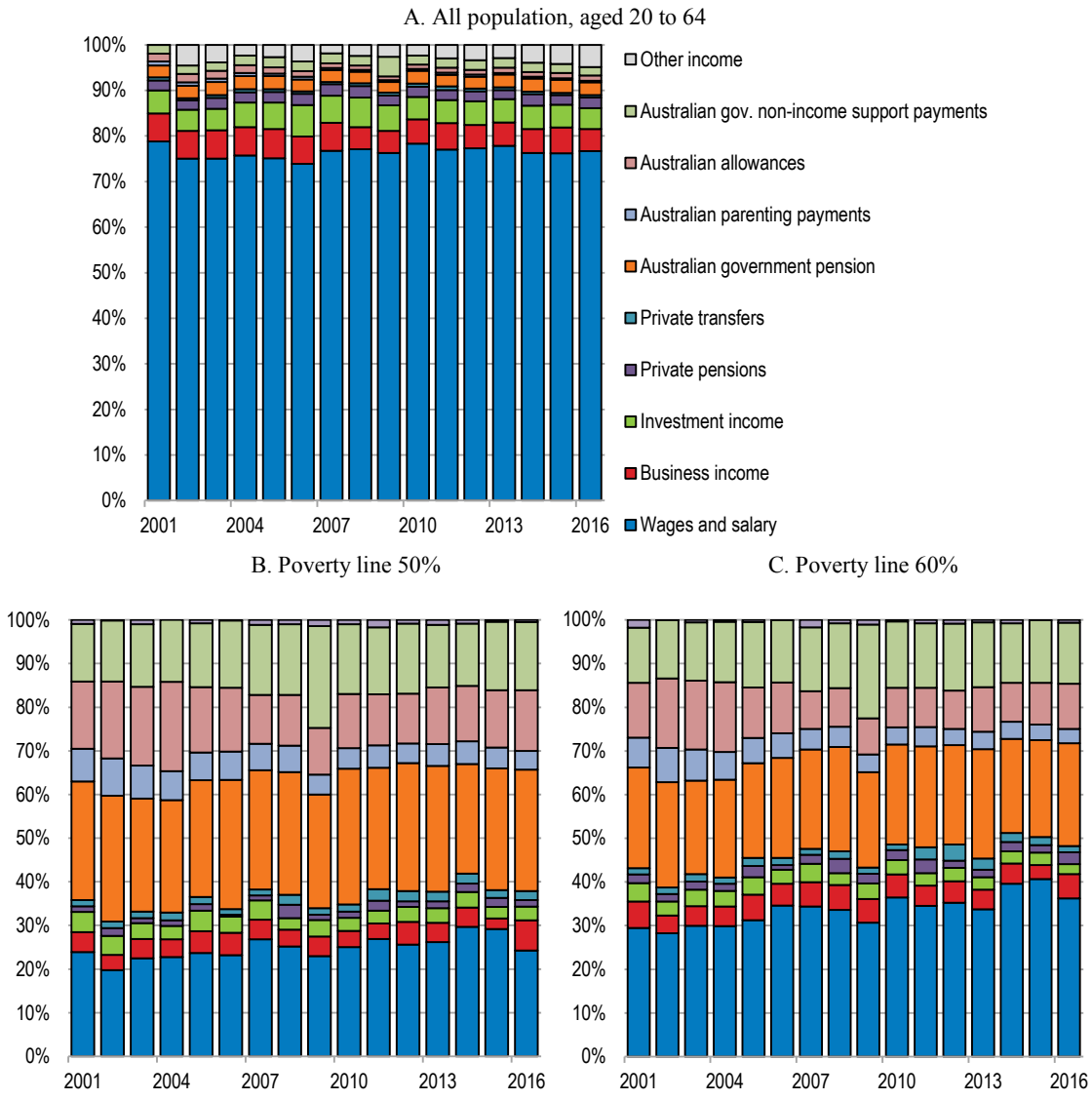
12. We compare the structure of total gross household income of poor households to that of all households, for two groups, working age (20 to 64 years) and the elderly (over 64 years). From Figure 5 we can observe that working age individuals primarily rely on wages and salaries as their main source of income (76% of income on average over the last three years, financial year (FY) 2013/14 to FY 2015/16), followed by business income (unincorporated business income) and investment income (interests, rents and dividends and royalties). These three sources together represent close to 90% of total income.

13. Poor households have quite a different structure of their income. For households below the 50% poverty line, wages and salaries only represented 28% of total income (on average 2013/14-2015/16). This is followed by various government transfers: government pensions (27%) and government non-income support (16%) (family payments, government bonus payment and other non-income support), and allowances (15%). A major difference between households below 50% poverty line and those below the 60% poverty line is that those below the 60% line receive a larger share of wage and salary income (39%), suggesting a substantial increase in labour market attachment between the 50 and 60% thresholds.

14. An interesting feature from the background data used to construct Figure 5 is the evolution of income around the global financial crisis, from FY 2006/7 to 2008/9. While for all working age households, the average real wage and salary income rose in dollar value by about 8%, for households below the poverty line it recorded a significant drop (14% drop for those below the 50% poverty line). This underscores that the labour market attachment of poor households is often marginal, and the group as a whole experienced greater job losses and working-hours reductions compared with non-poor households. This said, there was an offsetting increase in government non-income support during the crisis. While wage and salary income of poor households dropped in dollar value, their total real income was preserved, thanks to the government intervention.

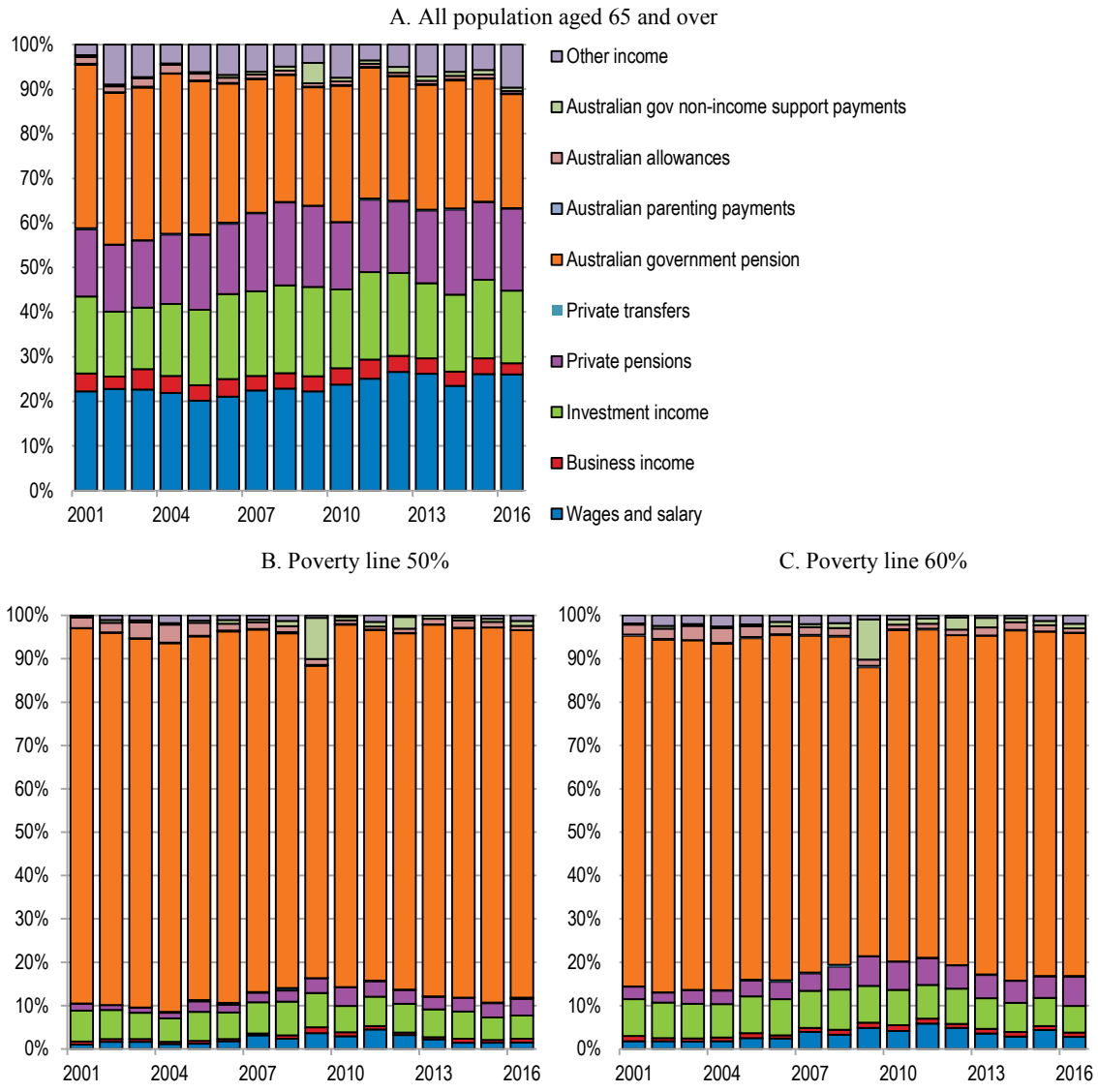
15. Consider now people of age 65 and above, Figure 6. For all elderly households in Australia on average, household income comprises mostly of government pensions (27% on average over the three years between FY 2013/14 and 2015/16), wages and salaries (25%), followed by private pensions (18%) and investment income (17%). Poor households, on the other hand, are much more reliant on government pensions. Over FY 2013/14-2015/16 period they represented 85% of the total household income for elderly households below the 50% poverty line. The second major source of income is investment income, 6% of total gross income. Again, as for the working age group, we can see increasing government support in FY 2008/9.

Figure 5. Sources of income among working-age (20-64 years) cohorts- comparison of poor households with all households



Source: OECD calculations based on HILDA database.

Figure 6. Sources of income among old people (age 65+) - comparison of poor households with all households



Source: OECD calculations based on HILDA database.

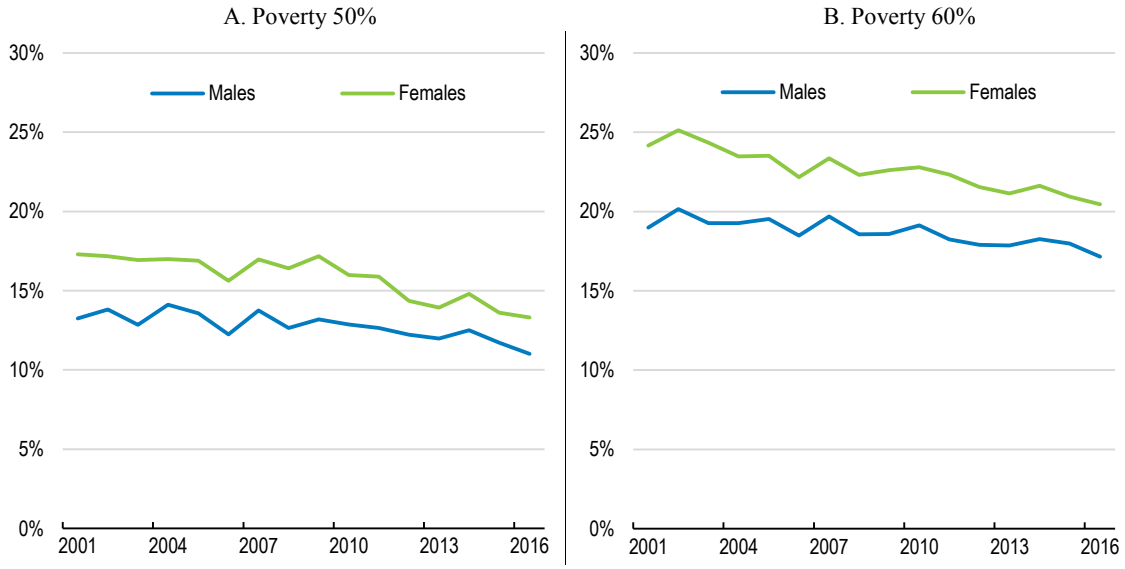
Poverty across gender, age and household type

16. Women are at a higher risk of living in poverty compared to men (Figure 7), although the risk of poverty has been reduced for both groups over the last 15 years and more rapidly for women. In FY 2015/16, 20% of women lived below the 60% poverty line, and 13% below the 50% line. For men, the shares were 17% and 11%, respectively.

17. Consider now the risk of poverty by age, shown in Figure 8. It is striking that the age group with by far the highest risk of poverty are the elderly. Prior to 2010 around 40% of individuals of age 65 and above were living in a household with disposable income below 50% of the median. This has since been reduced to 30%, but it nevertheless remains a high figure. For the 60% poverty line, more than half of the elderly lived in poverty until

around 2010, with a declining trend to 44% in 2016. The poverty among the elderly in Australia is also very high in international comparison (Figure 9), according to the OECD Income distribution and poverty database.

Figure 7. Poverty rates for males and females (age 15 and over)

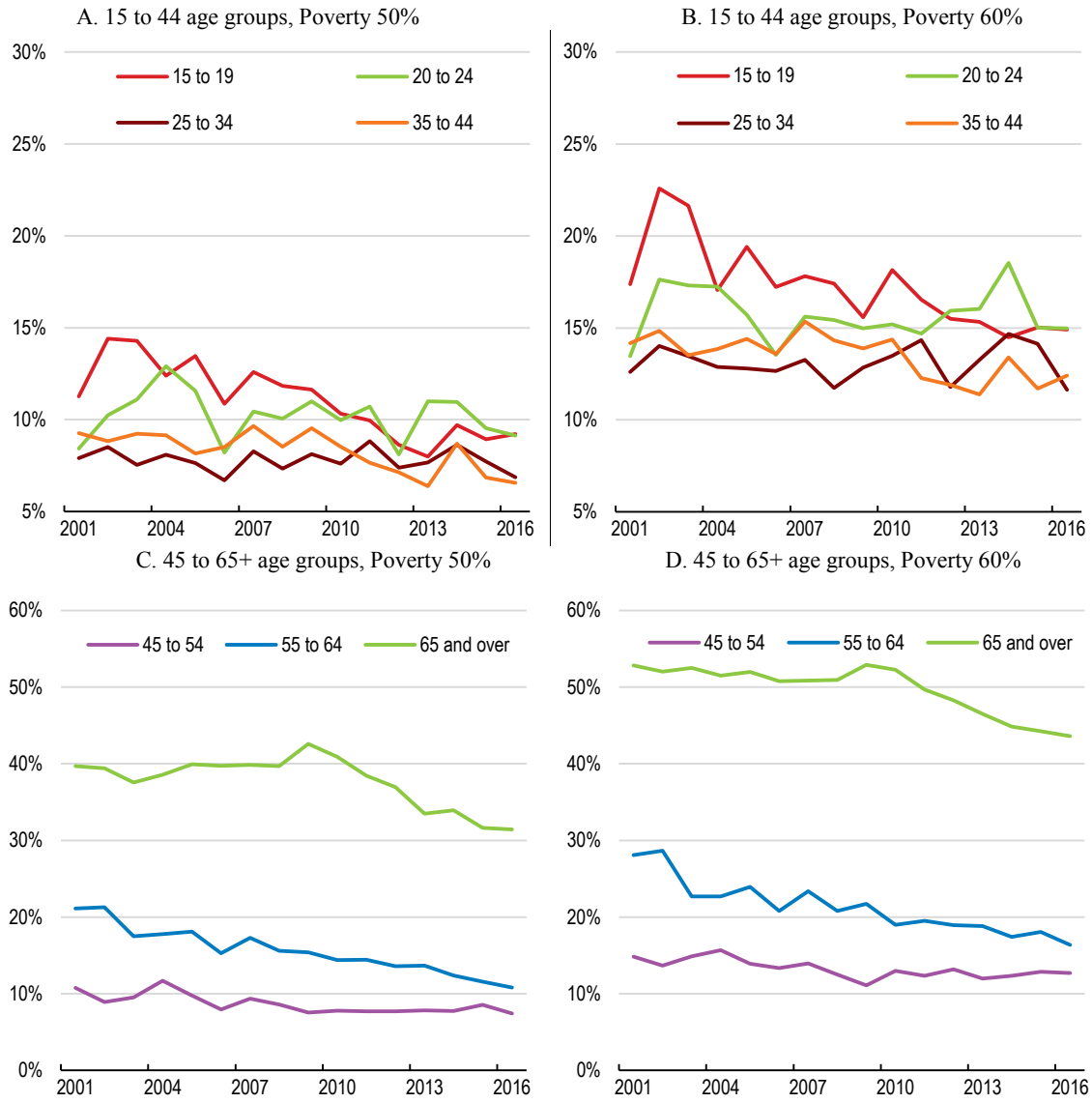


Source: OECD calculations based on HILDA database.

18. Very high poverty and social exclusion of the elderly are also reported for Australia in ACOSS (2014 and 2016) and Azpitarte and Bowman (2015). It is noteworthy that ACOSS (2016 and 2014) report similar overall poverty rates as in our data, however, variation across age according to their analysis is somewhat different, driven by the fact that they take into account housing costs. While for older people they still report the highest rate of poverty (except compared to the poverty rate of children below the age 15, which are excluded from our analysis), the difference with the rest of the population is less pronounced. As many older people own their houses and have repaid their mortgages, this provides significant protection against poverty (ACOSS, 2016). Moreover, many pensioners decide to take a significant amount of their pensions (superannuation) as a lump sum at the onset of their retirement, which thereafter does not count as current income and cannot be factored into HILDA measures of income poverty.

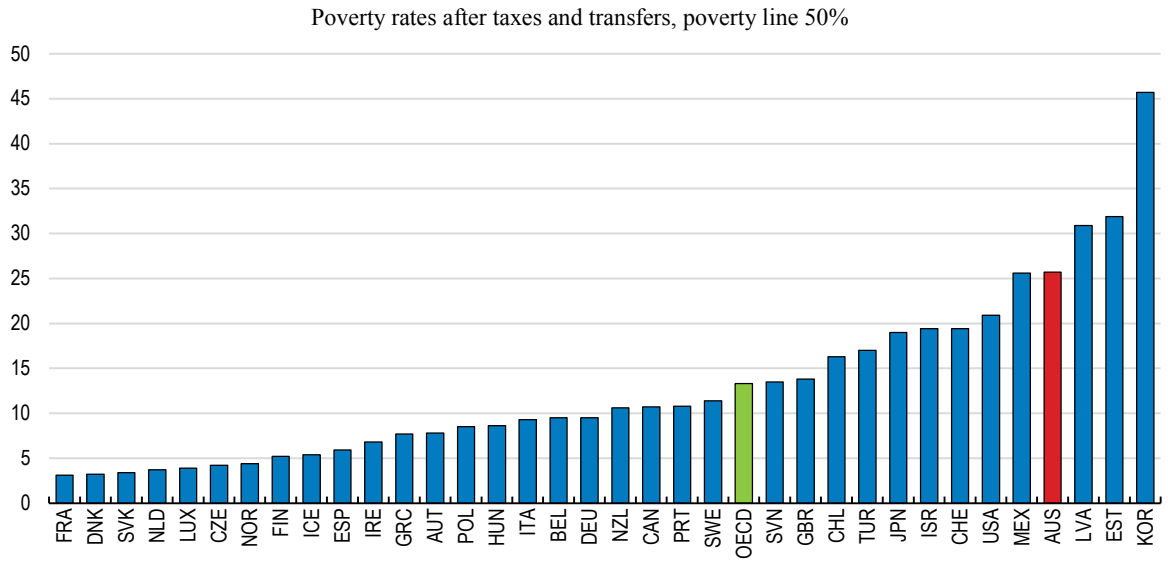
19. Most groups saw a decline in poverty over the 15 year period (Figure 8). The biggest declines have been experienced by older people (55-64, and 65 and above), albeit from a high base. According to ACOSS (2016) the decline in relative poverty of the elderly can be attributed to the 2009 increase of pensions to single people, linkage of pensions to both inflation and wage increases (unlike other government income support payments that are generally only linked to inflation), and that an increasing number of people retire with some superannuation. Another group that saw a significant decline in poverty rates were young adults - 15-19 years old.

Figure 8. Poverty by age groups



Source: OECD calculations based on HILDA database.

Figure 9. Poverty of old people across OECD countries (age 65 and over)



Note: Data for Australia, Denmark and Switzerland refer to 2014 and 2016 for Israel.
Source: OECD, Income distribution and poverty database.

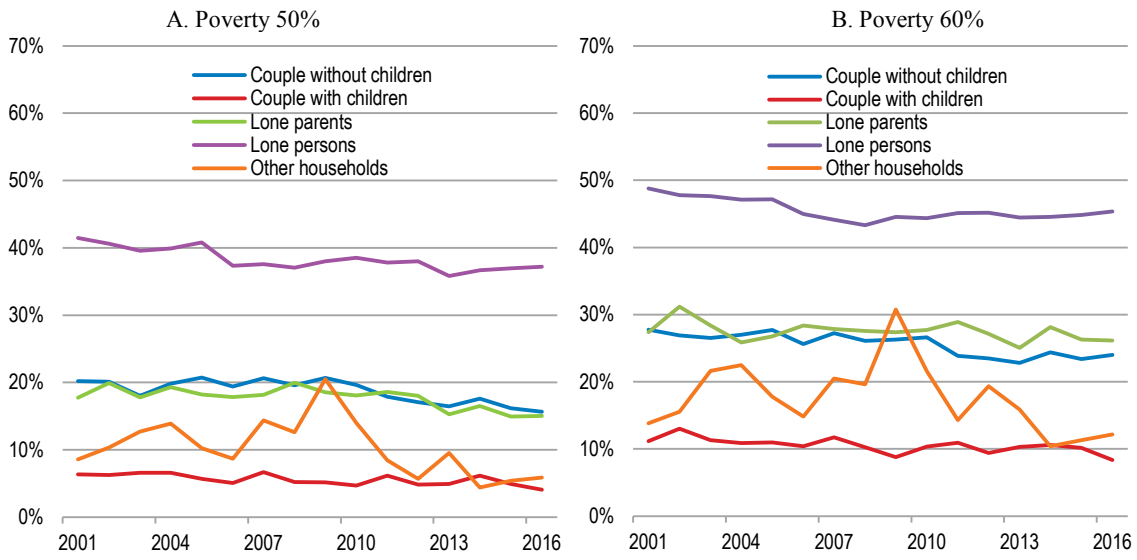
20. The two young cohorts, 20-24 and 25-34 year-olds on the other hand saw, at most, only very small drops in poverty rates, although admittedly they started off with below average rates of poverty. Nevertheless, such dynamics may capture part of what Daley and Wood (2014) call the divergence in the wealth of generations in Australia. They argue that older households have captured most of the recent growth in wealth due to higher growth in their incomes, the boom in house prices, and the fact that public spending is directed more towards the needs of the older households. Young Australians, they argue, may face lower standards of living than their parents at a similar age. This can in turn impact the differing speed of poverty reduction across age groups (Figure 8).

21. Next consider poverty across different household types, shown in Figure 10. Lone person households are most likely - close to 40% chance - to live in poverty. This is partly explained by the fact that many are elderly. When focusing on the working age group (20-64), shown in Figure 11, the poverty risk for lone person households is still high, but reduced in comparison to Figure 10. Another household type at high risk of poverty are lone parents. ACOSS (2016) note that high poverty among lone parent households is a driver of high and growing poverty among children in Australia. They report that children in lone families are more than three times more likely to be living in poverty than their counterparts in families headed by couples. Exploring child poverty is not possible with the HILDA dataset, as full information and sample weights are only provided for individuals of age 15 and above.

22. Among all age groups (Figure 10), couples without children have quite high poverty rates, but this is again most likely explained by many of them being retirees. In the working age population (Figure 11), couples without and with children have the lowest poverty rates. One should nevertheless remember that people that live as couples with children are the biggest group among working age households, thereby, despite facing the lowest risk of poverty, they in fact represent the largest number of poor people. Finally, note that the "other households" group, which comprises of multifamily and other related

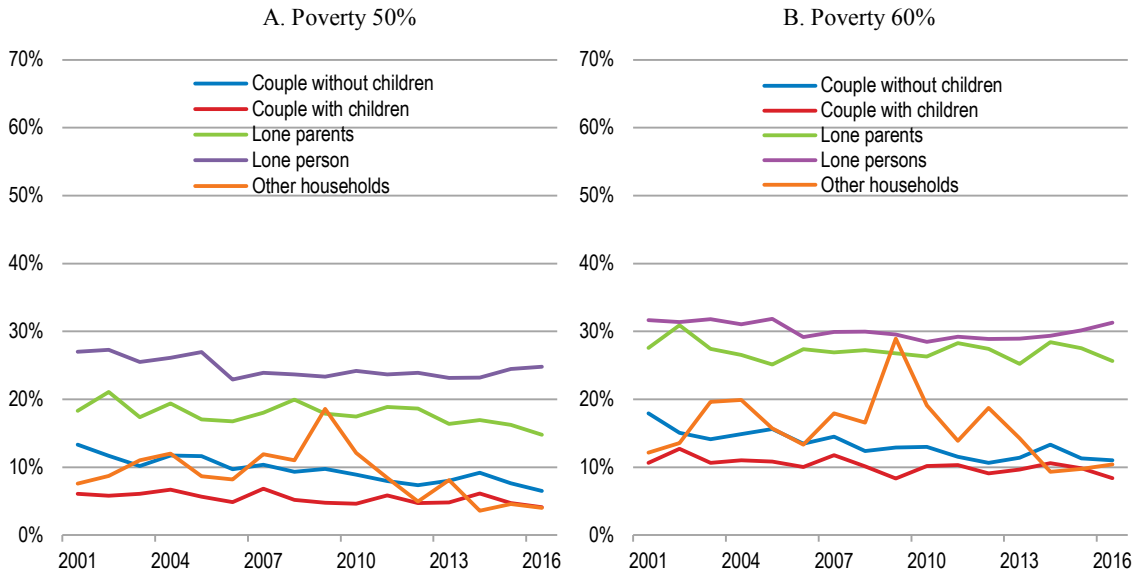
family households, is tricky to analyse because it is a relatively small and diverse group; results are therefore not discussed.

Figure 10. Poverty across household types (all ages, 15+)



Note: Other households comprise group or multi-families and other related family.
Source: OECD calculations based on HILDA database.

Figure 11. Poverty across household types (working age, 20-64)

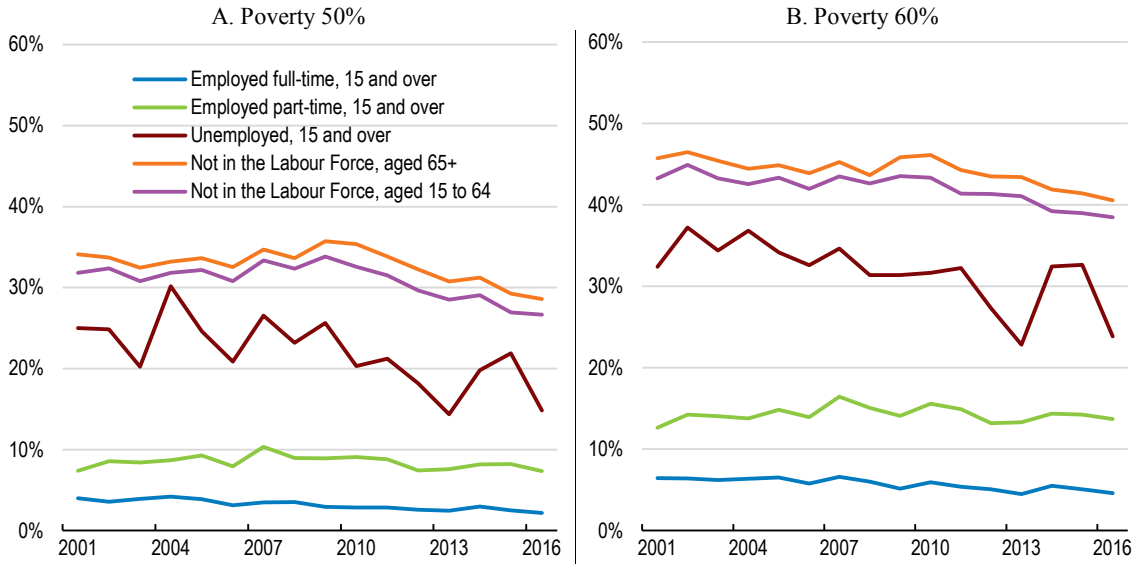


Note: Other households comprise group or multi-families and other related family.
Source: OECD calculations based on HILDA database.

Poverty across labour force status and the working poor

23. We now turn to relative poverty across labour force status. As can be seen from Figure 12, full-time employed individuals have the lowest poverty rates. People employed part-time are about three times as likely to live in poverty as compared to the full-time employed. The unemployed have even higher rates of poverty, about 15% in FY 2015-16, although the rate is quite volatile over time. The highest poverty however is experienced by those not in the labour force, especially the elderly, as we already discussed above. The group "not in labour force of working age" includes students, parents not working, those who otherwise cannot or are unwilling to work. For all groups we can observe a trend reduction in poverty rates over the 15-year period, except for the part-time employed group.

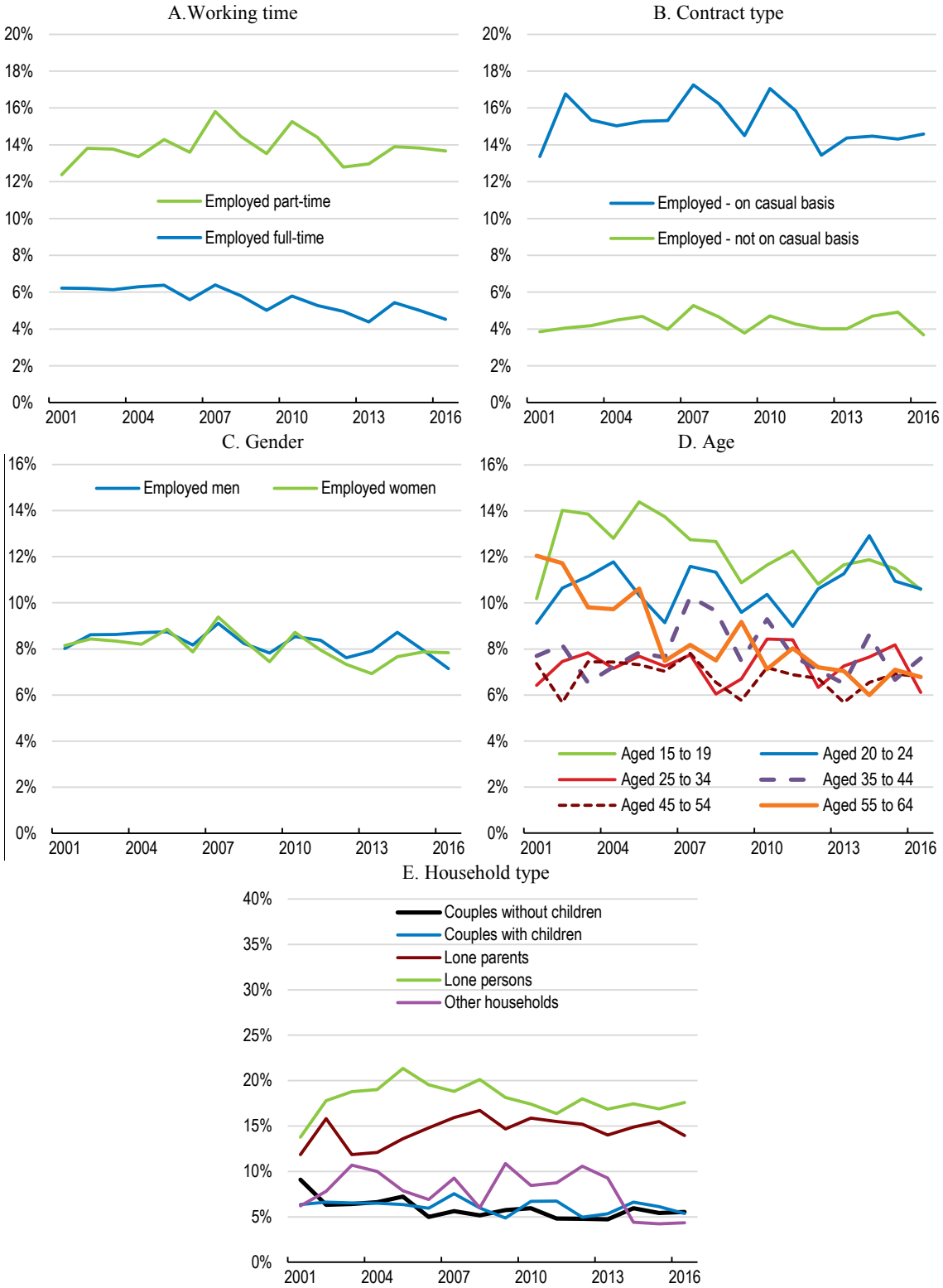
Figure 12. Poverty by labour force status



Source: OECD calculations based on HILDA database.

24. While concern often focuses on groups that exhibit highest incidence of poverty such as the unemployed or those out of the labour force, we should not overlook those who work, even full-time, but still end up being poor. Moreover, it is important to keep in mind that employed individuals represent the biggest group, therefore there is actually a higher number of poor among the full-time employed, compared to the poor employed part-time or the unemployed.

Figure 13. Poverty of employed persons (age 15-64, 60% poverty line)



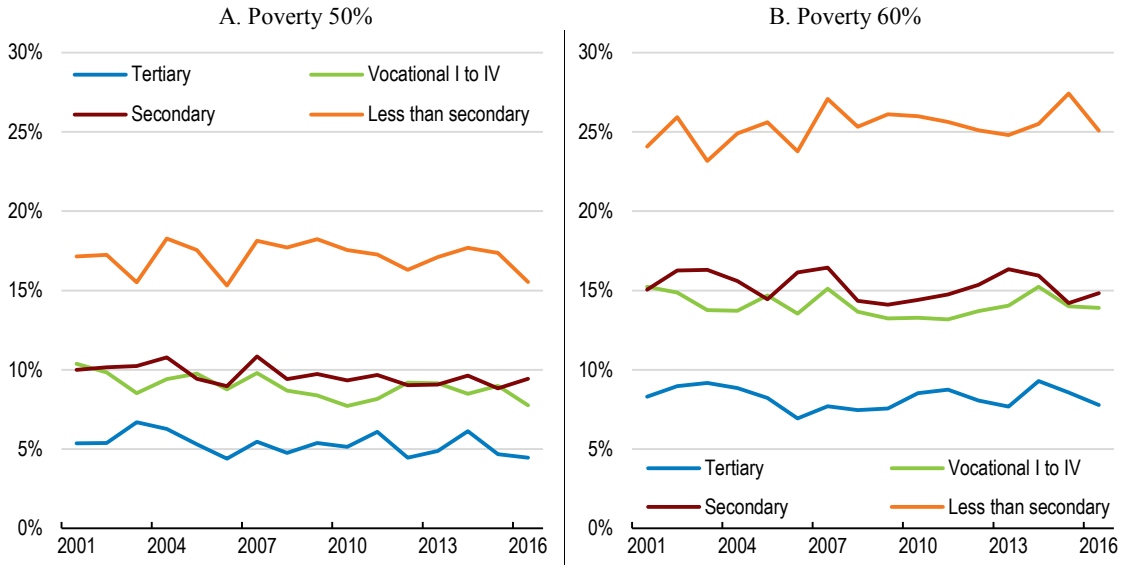
Note: For panel B, casual basis employment refers to employees who receive no leave or sickness entitlement (Australian Bureau of Statistics definition). More broadly, casual employment can be temporary, provide irregular hours and is not guaranteed to be ongoing. For Panel E, Other households comprise group or multi-families and other related family.
Source: OECD calculations based on HILDA database.

25. In order to understand who the "working poor" are, we look at the risk of poverty across various personal and household characteristics of employed persons (full-time and part-time) (Figure 13). To avoid repetition, we show only poverty below the 60% poverty line. From Figure 13 we can see that part-time workers and casual employed are at much higher risk of being poor than other employed, as reported already above. Between employed men and women there is no clear difference in the incidence of poverty. Young workers are more likely to be poor, in part because they tend to be employed part-time in greater numbers. As Borland (2016) observes, young workers have experienced the largest increase in part-time employment since late 1970s, explained by an increasing proportion of them being in full-time education. Finally, the employed living in lone-person households are most at risk of poverty, followed by lone parents.

Poverty across education and skill

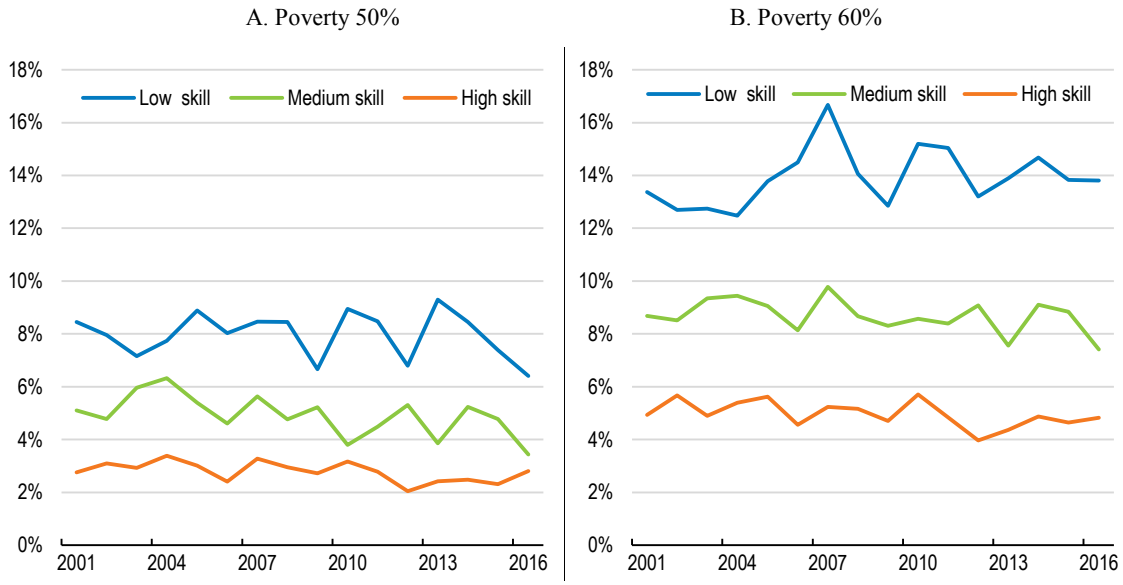
26. The risk of poverty falls as education attainment rises, for the group of age 20-64 (Figure 14). In particular, individuals with less than secondary education are at much higher risk of poverty than others. A similar pattern is apparent across skill groups (Figure 15). The measure of skill is obtained from the broad occupation variable from the HILDA data, whereby occupations are grouped into high-skill, medium skill, and low skill categories based on average salaries within each occupation. It is only available for employed individuals. As apparent from Figure 15, low-skill individuals have 2-3 times greater probability of living in poverty, than do high-skill individuals.

Figure 14. Poverty rates across education levels (age 20-64)



Source: OECD calculations based on HILDA database.

Figure 15. Poverty rates across skill (age 20-64, employed persons)



Note: Occupations are ranked by wage level following Autor and Dorn (2013) and Goos et al. (2014). High-skill occupations include jobs classified under the ISCO-88 major groups 1, 2, and 3. That is, legislators, senior officials, and managers (group 1), professionals (group 2), and technicians and associate professionals (group 3). Middle-skill occupations include jobs classified under the ISCO-88 major groups 4, 7, and 8. That is, clerks (group 4), craft and related trades workers (group 7), and plant and machine operators and assemblers (group 8). Low-skill occupations include jobs classified under the ISCO-88 major groups 5 and 9. That is, service workers and shop and market sales workers (group 5), and elementary occupations (group 9).
Source: OECD calculations based on HILDA database.

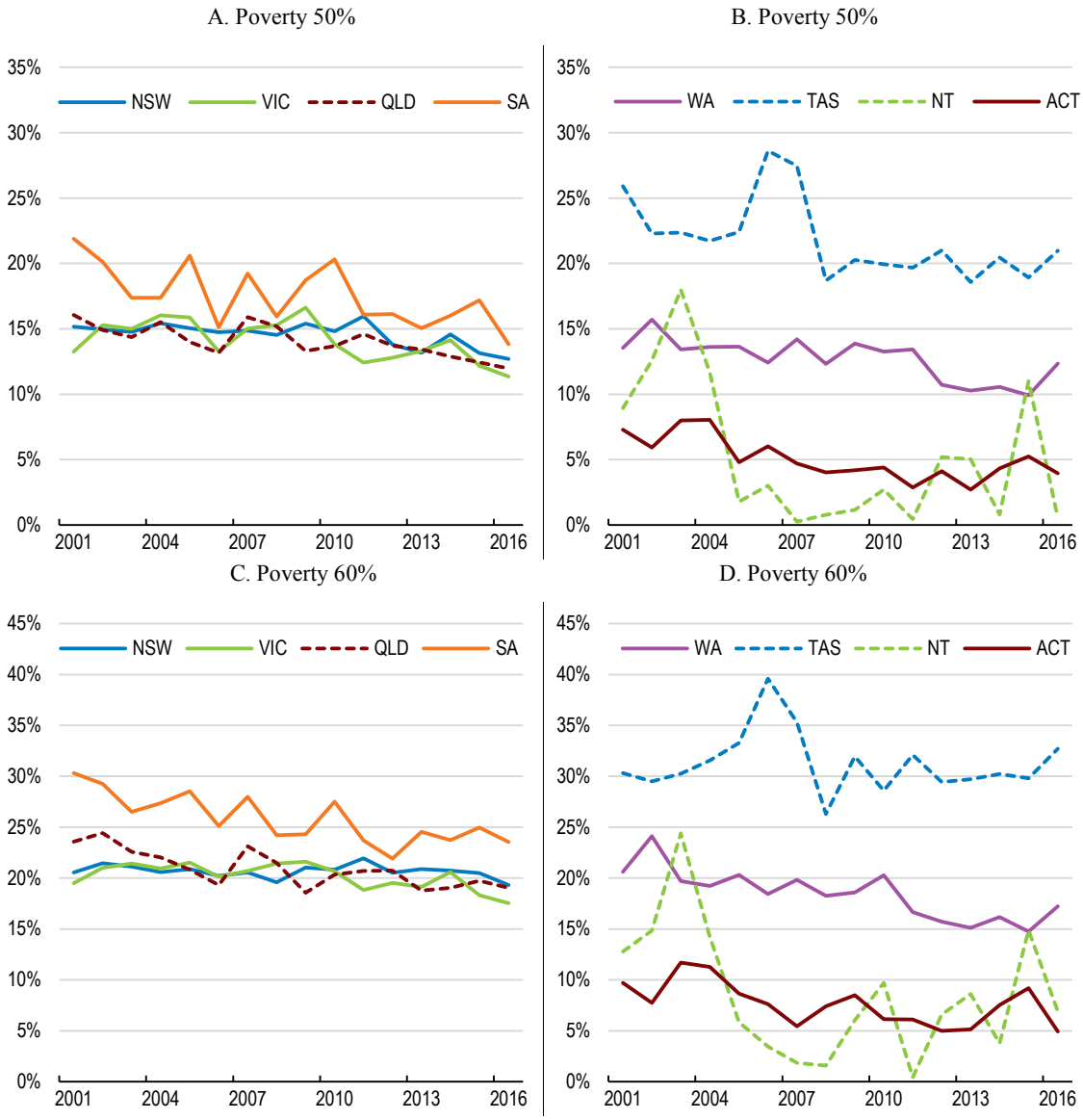
Poverty across regions and ethnic background

27. The highest incidence of poverty is faced by households in Tasmania and South Australia, while the lowest risk is observed in Australian Capital Territory and Northern Territory (Figure 16). Although New South Wales, Victoria and Queensland do not have high rates of poverty, due to their size most poor people live in these three states. Hence, one cannot argue that poverty is a problem of specific regions, at least not at the level of states and territories.

28. With respect to remoteness (Figure 17), "Outer Regional" Australia shows the highest rate of poverty, followed by "Inner Regional Australia" and "Remote Australia". Major cities show the lowest poverty rates, but as Australia is a highly urbanised country with most people living in big cities, a higher number of poor people actually live in major cities compared to all other three areas combined.

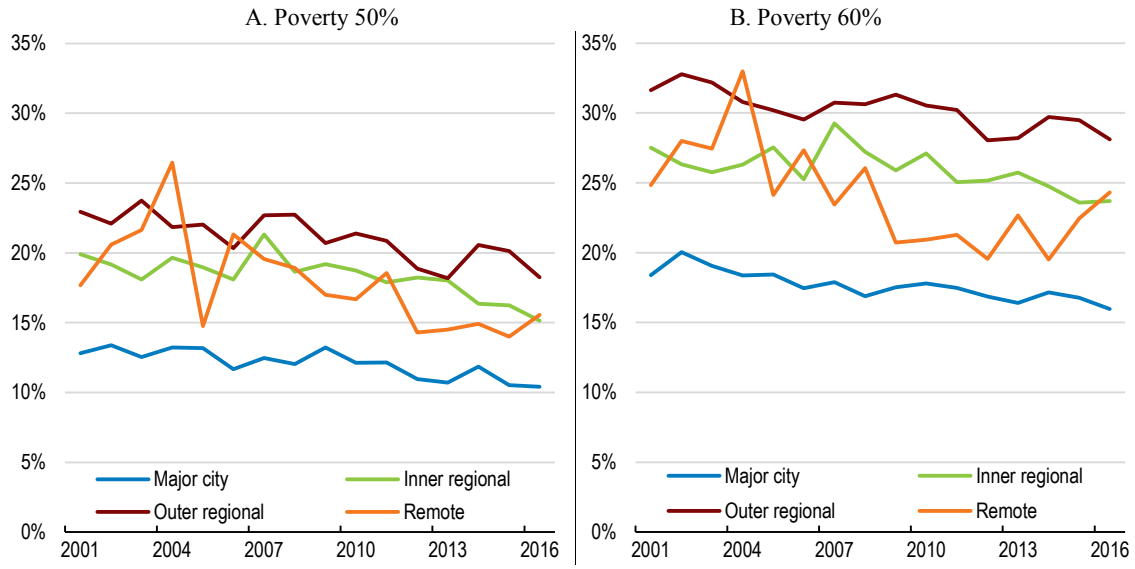
29. People born in Australia have the lowest probability of living in poverty (Figure 18), followed by immigrants with English speaking background and then the rest. The gap has been closing, in particular over the last couple of years. Indigenous Australians, on the other hand, are almost twice as likely to be poor than the rest of Australians (Figure 19), and recently the gap appears to be widening. Due to limited sample size the poverty rate of indigenous people is quite erratic, therefore the data need to be interpreted with caution.

Figure 16. Poverty rates across states and territories



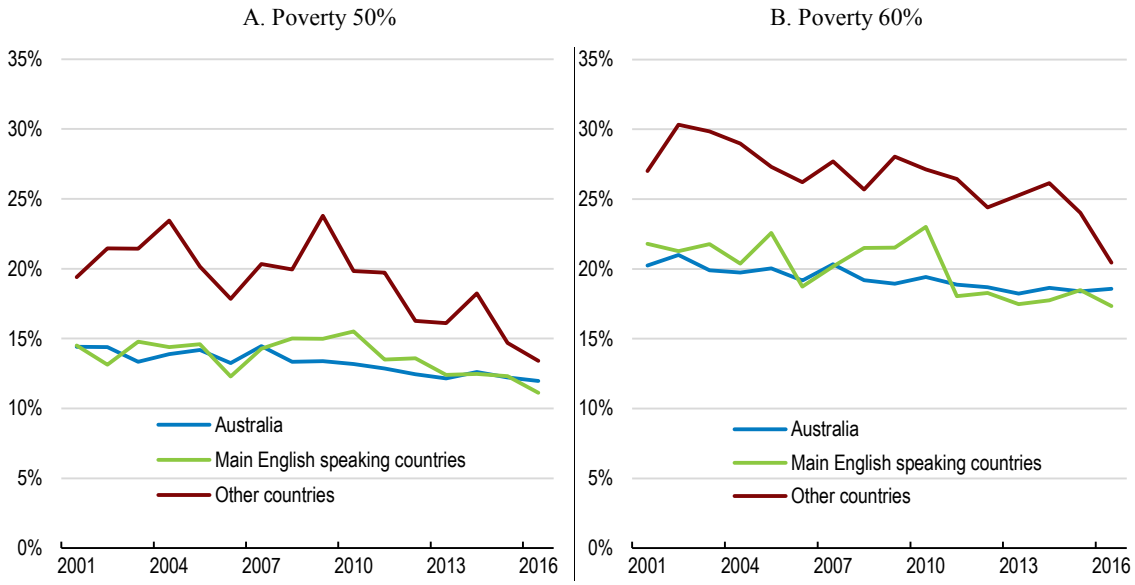
Source: OECD calculations based on HILDA database.

Figure 17. Poverty rates across remoteness levels



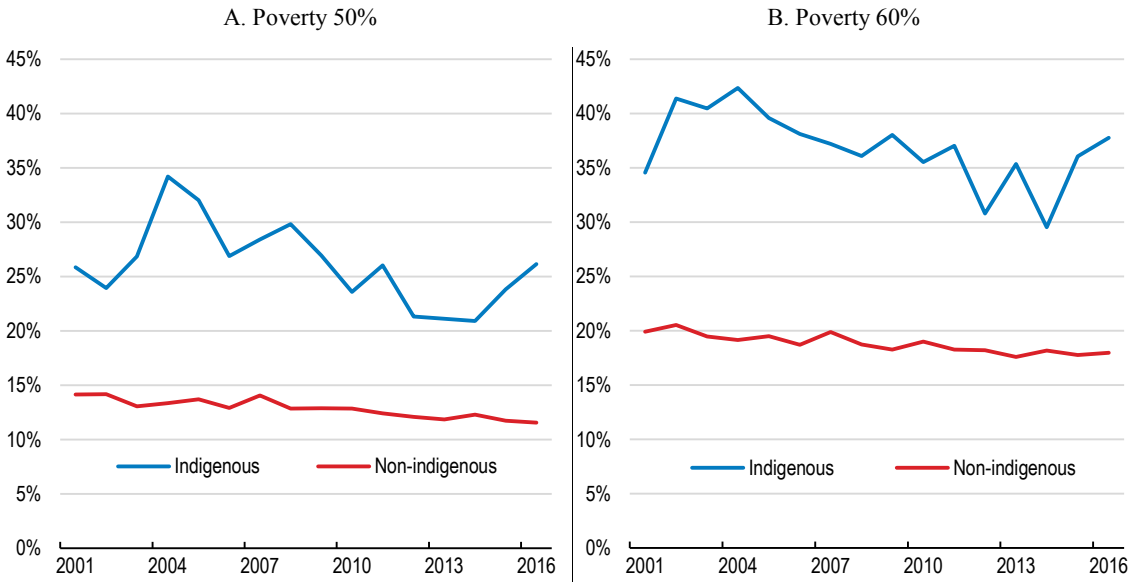
Source: OECD calculations based on HILDA database.

Figure 18. Poverty rates across country of birth



Source: OECD calculations based on HILDA database.

Figure 19. Poverty rates across indigenous status



Source: OECD calculations based on HILDA database.

Probability of living in poverty - results from a multivariate probit

30. Finally, we compute the risk of poverty across various individual and household characteristics using a multivariate probit. The difference with the previous analysis is that in the regression we control for various personal and household characteristics simultaneously, whereby the resulting effect of each characteristic is evaluated in ceteris paribus terms (i.e. while holding other characteristics constant). The dependent variable is a categorical variable equal to one if a person is poor and zero otherwise. As above, individuals are classified as poor if they live in households that earn below 50% (or 60%) of the median equivalised household income in a given year. We run four different specifications, one for all persons in the sample of age 15 and above, and then also for all employed people, where we restrict the sample to age group 15-64. Both models are run for the 50% and 60% poverty line.

31. The results are presented in Table 1 (marginal effects on probability of living in poverty) and also in Figures 20 and 21 (marginal predicted probabilities). The coefficients estimated by probit show the significance and direction of the effect of each variable on the outcome probability, but they do not directly quantify marginal effects. The latter need to be computed from the coefficients, but they differ for different values of the RHS variables. Hence, when computing the marginal effects and predicted probabilities, one needs to pick a point in the sample. We report marginal effects at the mean value of all RHS variables. While the chosen value affects the size of the marginal effect, it does not impact the direction or statistical significance.

32. The results from the probit analysis are generally very similar to the simple sample probabilities shown earlier. For brevity and to avoid repetition, we will discuss the results in broad terms, touching on the most interesting elements.

Table 1. Probability of being in poverty - results from multivariate probit

	(1)	(2)	(3)	(4)
	All (15+)		**Employed persons (15-64)**	
Dependent variable: Living in poverty categorical variable	50% poverty line	60% poverty line	50% poverty line	60% poverty line
Gender				
Men vs. Women	1.360***	2.523***	0.296**	1.262***
	(0.256)	(0.354)	(0.119)	(0.214)
Age				
15 to 19 vs. 45 to 54	-0.523	-2.255***	1.750***	1.602***
	(0.372)	(0.492)	(0.227)	(0.329)
20 to 24 vs. 45 to 54	2.714***	4.622***	1.855***	3.257***
	(0.408)	(0.541)	(0.199)	(0.323)
25 to 34 vs. 45 to 54	0.538	2.155***	0.500***	1.576***
	(0.361)	(0.491)	(0.149)	(0.274)
35 to 44 vs. 45 to 54	1.530***	2.980***	0.757***	1.607***
	(0.358)	(0.463)	(0.156)	(0.261)
55 to 64 vs. 45 to 54	-0.455	-0.729	0.047	-0.041
	(0.329)	(0.447)	(0.164)	(0.277)
65 and over vs. 45 to 54	1.877**	4.569***		
	(0.884)	(1.193)		
Household type				
Couples with children vs. Couples without children	-6.001***	-6.321***	-1.136***	-1.045***
	(0.271)	(0.370)	(0.129)	(0.208)
Lone parents vs. Couples without children	2.594***	8.319***	1.883***	6.331***
	(0.478)	(0.670)	(0.256)	(0.442)
Lone person vs. Couples without children	22.600***	25.853***	10.050***	14.498***
	(0.569)	(0.636)	(0.374)	(0.496)
Other households vs. Couples without children	-4.563***	-3.651***	0.255	0.772**
	(0.379)	(0.556)	(0.225)	(0.350)
Labour force status				
Employed PT vs. Employed FT	6.627***	11.111***	3.012***	5.700***
	(0.227)	(0.319)	(0.188)	(0.293)
Unemployed vs. Employed FT	21.466***	29.246***		
	(0.607)	(0.677)		
NILF 65 and above vs. Employed FT	23.820***	34.168***		
	(1.435)	(1.551)		
NILF 15-64 vs. Employed FT	22.859***	31.426***		
	(0.462)	(0.517)		
Education				
Vocational I to IV vs. Tertiary	4.374***	8.181***	0.199	1.447***
	(0.340)	(0.472)	(0.154)	(0.285)
Secondary vs. Tertiary	4.730***	7.792***	0.599***	1.575***
	(0.359)	(0.494)	(0.158)	(0.276)
Less than Secondary vs. Tertiary	8.092***	13.253***	0.942***	2.525***
	(0.333)	(0.453)	(0.190)	(0.332)
Skill				
Middle vs. Low			-0.778***	-1.177***
			(0.154)	(0.268)
High vs. Low			-1.554***	-3.233***
			(0.160)	(0.271)
Contract type				
Casual vs. non-casual			2.710***	4.593***
			(0.183)	(0.280)

Probability of being in poverty - results from multivariate probit (continued)

	(1)	(2)	(3)	(4)
	All (15+)		Employed persons (15-64)	
Industry				
Agriculture, forestry, fishing, mining vs. Other services			0.215	-0.285
			(0.284)	(0.502)
Manufacturing vs. Other services			-0.079	-0.171
			(0.202)	(0.366)
Construction vs. Other services			0.379	-0.356
			(0.247)	(0.406)
Wholesale/retail trade vs. Other services			-0.282**	-0.579**
			(0.133)	(0.255)
Transport, storage and communication, electricity,			-0.238	-1.353***
gas and water supply vs. Other services			(0.216)	(0.349)
Finance and business services vs. Other services			0.089	-0.462
			(0.171)	(0.290)
Public administration, defence and private households vs. Other services			-0.559***	-2.302***
			(0.201)	(0.324)
Country of birth				
Foreign with English speaking background vs. Australia born	0.081	0.825	0.258	0.351
	(0.403)	(0.584)	(0.206)	(0.364)
Other background vs. Australia born	8.878***	12.008***	2.639***	5.109***
	(0.551)	(0.693)	(0.301)	(0.501)
Indigenous Australian vs. Australia born	8.195***	11.930***	3.496***	5.079***
	(0.826)	(1.107)	(0.539)	(0.806)
States and territories				
VIC vs. NSW	-0.195	-0.182	0.033	0.162
	(0.327)	(0.447)	(0.145)	(0.259)
QLD vs. NSW	0.003	0.470	0.195	0.502*
	(0.345)	(0.480)	(0.152)	(0.276)
SA vs. NSW	1.594***	3.488***	0.580**	1.282***
	(0.488)	(0.678)	(0.229)	(0.408)
WA vs. NSW	-0.540	-0.540	0.021	0.186
	(0.470)	(0.650)	(0.204)	(0.378)
TAS vs. NSW	0.383	1.221	-0.134	0.213
	(0.672)	(0.943)	(0.265)	(0.553)
NT vs. NSW	-6.893***	-10.147***	-1.413***	-2.740***
	(0.588)	(0.946)	(0.284)	(0.527)
ACT vs. NSW	-5.328***	-8.425***	-0.871***	-1.397***
	(0.644)	(0.916)	(0.256)	(0.519)
Remoteness				
Inner Regional Australia vs. Major City	3.253***	5.405***	0.820***	2.112***
	(0.309)	(0.420)	(0.140)	(0.254)
Outer Regional Australia vs. Major City	6.599***	10.891***	1.535***	4.015***
	(0.492)	(0.646)	(0.241)	(0.441)
Remote Australia vs. Major City	6.268***	7.508***	1.288**	1.902**
	(1.193)	(1.461)	(0.503)	(0.771)
Time dummies				
Year dummies	yes	yes	yes	yes
No. of observations	235,216	235,216	120,140	120,140
R-squared	0.282	0.272	0.196	0.171
Probability of poverty (at mean value for all X)	9.298	16.344	2.312	5.339

Note: Robust standard errors in parentheses, clustered by personal identifiers (*** p<0.01, ** p<0.05, * p<0.1). No sample weights are used in the regressions. Marginal effects are computed for the mean values of X. Individuals are classified as poor if they live in households that earn below 50% or 60% of the median equivalised household income in a given year.

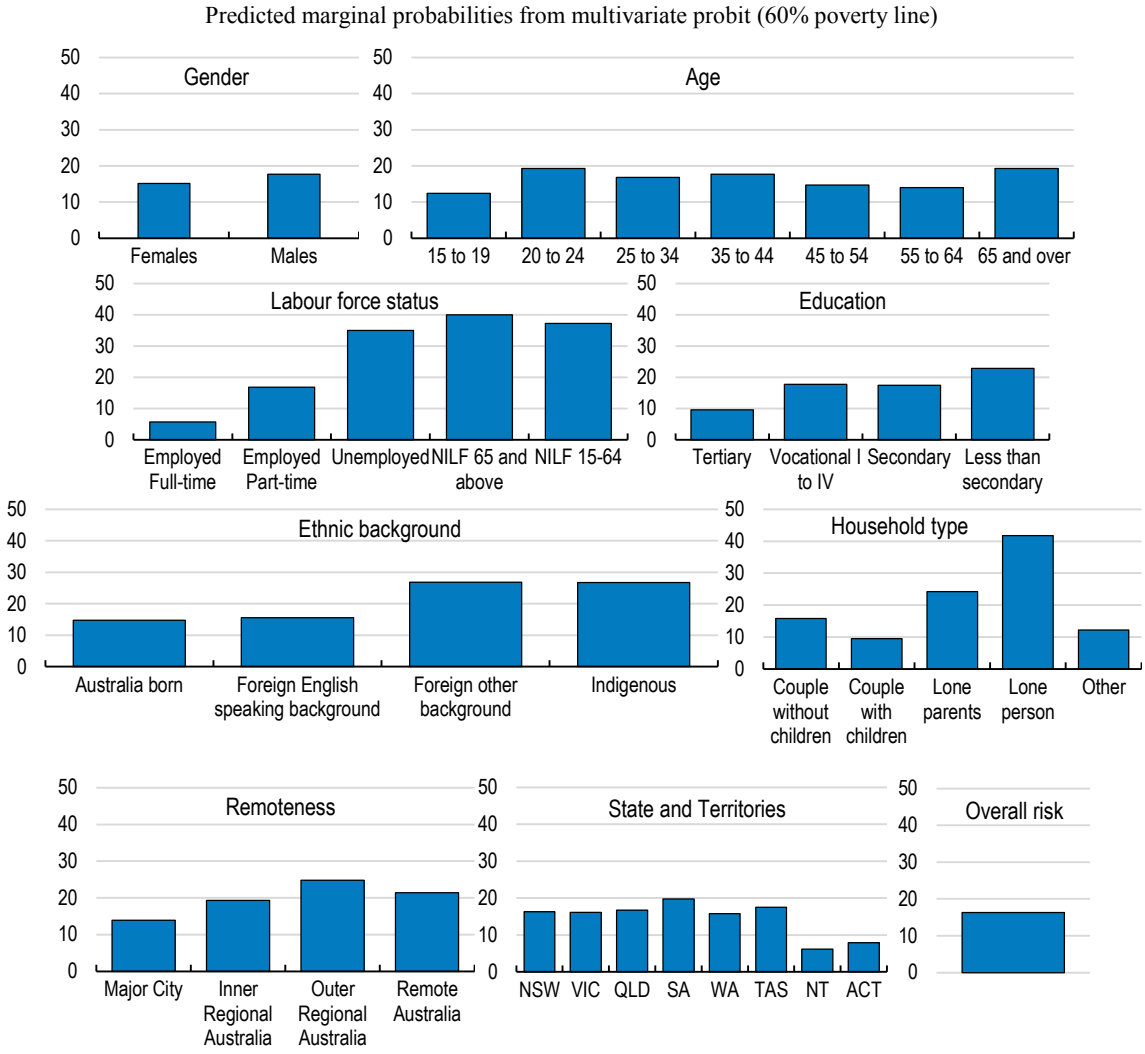
33. Interestingly, after controlling for other characteristics, men are at higher risk of poverty than women, a result seemingly at odds from what is shown in Figure 7. We know of course, that women have a higher overall risk of poverty precisely because their characteristics differ from those of men; they have lower likelihood of being employed, higher likelihood of being lone parents, lower education etc. But how can we explain the marginal coefficient that shows that in a probit regression, keeping all other characteristics unchanged, male risk of poverty is higher? This may arise from unobservable characteristics that affect the risk of poverty and are correlated with gender, such as life-style, prevalence of risky behaviour, and others.

34. The regressions show that while those aged more than 65 are still at a high risk of income poverty, the difference with other groups is much less pronounced than in the analysis of previous sections. In fact, controlling for other variables, old age exhibits the same risk of poverty as the age group 20-24. Less extreme results for old age stem from the fact that old age is highly correlated with living in a lone person household and being out of the labour force, variables that all raise the probability of poverty significantly.

35. The results for household type, education, labour force status, skill, ethnic background and states and remoteness give practically the same conclusions as discussed above. We however add an industry variable in the analysis of employed people (Table 1, columns (3) and (4), and Figure 21). These show that poverty is comparatively high among employees in the hospitality sector, education, health and social activities, manufacturing, agriculture, forestry, fishing and mining, and construction. On the other hand, the industry with lowest risk of poverty is - as expected - the public sector.

36. One nice feature of the visual representation in Figures 20 and 21 is that it shows which variables make the biggest difference to the risk of poverty. Again, the fact that we keep other variables constant is important to remember, as for some variables - such as gender or age - it makes an important difference. For example, in Figure 20 old age does not come out as strongly as it does above in Figure 8, and the reason is, that people are not so poor simply because of their age, but because old age correlates with labour force status (more likely not working), lower education, and higher likelihood of living in a lone-person household.

Figure 20. Risk of poverty across various characteristics – all those aged 15+

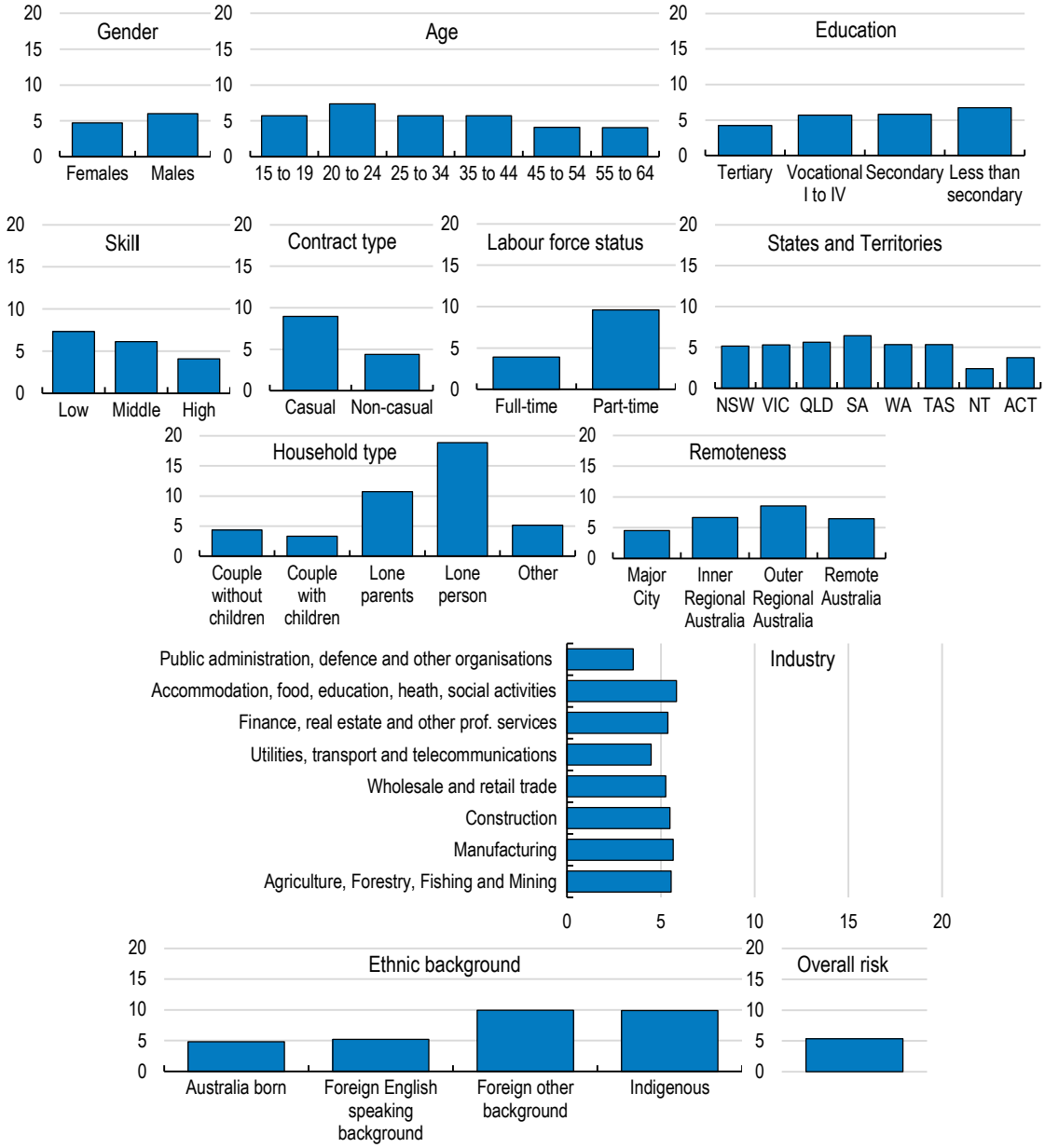


Note: Based on specification (2) from Table 1. Predicted probabilities are evaluated at the mean value of all RHS variables.

37. The variables that seem to be most detrimental in terms of poverty are labour force status variables (unemployed, not in the labour force), ethnic background (other foreign born and indigenous), household type (lone person and lone parent), and living in outer regional Australia. For employed persons, the characteristics that increase the risk of poverty the most are the contract type (casual workers are at significantly higher risk), ethnic background and the household type. It is interesting that ethnic background, indigenous status and remoteness have such significant effects even after controlling for education, age, industry and occupation. This means that such high poverty stems from additional unobserved characteristics, as for example health, local economy and discrimination.

Figure 21. Risk of poverty across various characteristics - employed

Predicted marginal probabilities from multivariate probit (60% poverty line)



Note: Based on specification (4) from Table 1. Predicted probabilities are evaluated at the mean value of all RHS variables.

Conclusion

38. Australia is a successful economy with high living standards. Yet, not everyone shares equally in this success. There is quite a large share of adults that live in poverty, more so than on average across the OECD economies. In this paper we use OECD data and HILDA Survey data to analyse poverty rates in Australia over time and across various personal and household characteristics. Individuals are classified as poor if they live in

households with incomes below 50% or 60% of the median equivalised household income in a given year.

39. While Australia has above average poverty rates, poverty has decreased in the last 15 years. Certain groups are more at risk than others. People living alone and lone parents are at higher risk of poverty. Old people in Australia have more than 30% chance of living in poverty, which is one of the highest in the OECD. Poverty among older cohorts has been reduced in the last 15 years, but nevertheless remains very high. It is important to mention that using measures of poverty that correct for housing costs, poverty in old age would be somewhat reduced, as many older people own their houses. Furthermore, controlling for the type of household (living alone) and the labour force status (out of the labour force) reduces the impact of old age on poverty. Yet, even after controlling for these factors, old people in Australia still have a very high incidence of poverty among adult population.

40. Being employed protects from poverty, as individuals out of the labour force and the unemployed are at much higher risk of poverty. Nevertheless, even some people who work are poor. Typically, casual workers and part-time workers face a higher risk of poverty. People with low education are also at risk. People who live alone or are lone parents face quite a high risk of poverty, even if they are employed.

41. Indigenous Australians are almost twice as likely to be poor than the rest of Australians. With respect to country of birth, foreign born Australians who are from non-English-speaking backgrounds are at significantly higher risk, too. While for immigrants the poverty gap has declined, for indigenous the gap has recently started rising. Results from a multivariate probit for the probability of poverty suggest that 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 reflects a range of socio-economic issues, including poor health and discrimination.

42. Researchers measuring social inequalities are moving away from using solely income-based measures of poverty, towards multidimensional indicators to better capture social deprivation and exclusion (Azpitarte and Bowman, 2015; Martinez and Perales, 2015; Productivity Commission, 2018). For instance, the Melbourne Institute of Applied Economic and Social Research and the Brotherhood of St Laurence have developed the Social Exclusion Monitor that measures social exclusion across seven life domains (material resources, employment, education and skills, health and disability, social connection, community and personal safety). Multidimensional measures of poverty are however beyond the scope of this paper. We leave this for future research.

References

ACOSS (2016), Poverty in Australia 2016. The fifth edition of 'Poverty in Australia', part of the 'Poverty and Inequality in Australia' series from the Australian Council of Social Service and the Social Policy Research Centre.

ACOSS (2014), Poverty in Australia 2014, series from the Australian Council of Social Service and the Social Policy Research Centre.

Andrews, B., and Thomas, J. (2015), "Estimation of EU-Comparable poverty-related variables in Australia, 2001–2013", Centre for the Study of Living Standards (CSLS), Research Report, No. 2015–13.

Atkinson, A.B., Cantillon, B., Marlier, E. and Nolan, B. (2002), *Social Indicators, The EU and Social Inclusion*, Oxford University Press.

Azpitarte, F., and Bowman, D. (2015), Social exclusion monitor bulletin, Brotherhood of St Laurence, Research Bulletin, June 2015.

Borland, J. (2016), 'What Has Caused Growth in the Under-employment of Labour in Australia?', Labour Market Snapshot #25. Available from: https://sites.google.com/site/borlandjum/labour-market-snapshots.

Daley, J., and Wood, D. (2014), The wealth of generations, Grattan Institute. December 2014.

Martinez, A. and Perales, F. (2015), The Dynamics of Multidimensional Poverty in Contemporary Australia", *Social Indicators Research*, vol. 130, no. 2, pp. 479-496.

OECD (2016). Income inequality remains high in the face of weak recovery, Income Inequality Update, Centre for Opportunity and Equality (COPE).

OECD (2015), In It Together: Why Less Inequality Benefits All, OECD Publishing, Paris.

OECD (2008), Growing Unequal? Income Distribution and Poverty in OECD Countries, OECD Publishing, Paris.

Productivity commission (2018), Rising inequality? A stocktake of the evidence. Productivity Commission Research Paper, August 2018.