Labour market inequality in Australia*

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Abstract

This article reviews developments in labour market inequality in Australia. First, descriptive information on changes in labour market inequality and on the causes of those changes is integrated with a summary of findings from recent research. Second, the effect of changes in labour market inequality on income inequality is evaluated. Third evidence on differences in earnings and employment outcomes between specific groups – by gender, indigenous status and country of birth – is considered. Finally, some suggestions for future research are presented.

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I. Introduction

Inequality in labour market outcomes has a variety of important consequences. Earnings from labour market activity are the primary determinant of individual and household income, and therefore it is differences in labour market earnings that are the major source of inequality in gross income. As an illustration, Figure 1 shows average annual labour market income and average annual gross income in 2012-13 for each decile in the distribution of household income. The income data are for individuals, and the ranking is done by assigning each individual to a decile based on their households' ranking in the distribution of equivalent household gross income. Labour market earnings are seen to be highly correlated with gross income across the whole distribution. Labour market outcomes can also have a direct effect on the distribution of individual well-being; such as the variation in life satisfaction between employed and unemployed labour market participants (for Australian evidence, see Carroll, 2007).

The past decade has brought a renewed interest in labour market inequality in Australia. This has happened partly as researchers have sought to replicate international studies which, for example, have found evidence of substantial growth in inequality at the very top of the earnings distribution (Atkinson and Piketty, 2010), a decreasing number of middle-skill jobs (Goos and Manning, 2007; Acemoglu and Autor, 2011, Goos *et al.*, 2009), and general stagnation in the demand for labour (for example, Glaeser, 2014). Developments in Australia including industrial relations reform and the mining boom, and the scope to apply new data sources such as the HILDA survey, have provided a further motivation to study recent changes in labour market inequality.

The objective of our article is to review the new evidence on labour market inequality in Australia. We do this by integrating descriptive information with a review of the findings from recent research (primarily published since the early 2000s; see Table A1 for a list of the main studies). The main tasks we undertake are to: (i) summarise changes over time in labour market inequality; (ii) evaluate evidence on the causes of changes to inequality; and (iii) examine the main consequences of labour market inequality.

The significance of labour market outcomes for income inequality means that it is at the level of the labour market that many policy responses to inequality, such as incentives to participate in the paid workforce and to work extra hours, seek to operate. Therefore this review should be valuable background for public policy, as well as providing a window onto

the main drivers of labour market outcomes in Australia. A further contribution of the article is to identify key gaps in current knowledge in order to provide a launching place for future research.

Several recent reviews of the evolution of earnings inequality are available for the US and Europe (for example, Acemoglu and Autor, 2011; OECD, 2011; Eurofund, 2015). But there has been no major review of Australian evidence for some time.¹

Inequality in labour market earnings can derive from differences in the amount of work that individuals do and from differences in the rate of pay they receive. Hence this review addresses inequality both in employment and in earnings. One approach we take is to examine trends in the overall distributions of employment and earnings. This is followed by a review of evidence on differences in earnings and employment outcomes between specific groups – by gender, indigenous status and country of birth.

The outline for the article is as follows. Section II introduces the alternative data sources used to study labour market inequality in Australia. Section III examines employment inequality – differences in the probability of employment and hours of work - in the Australian population. Section IV describes earnings inequality between employed persons and evaluates potential causes of recent changes. Section V considers how labour market outcomes have affected income inequality. Section VI presents evidence on inequality between specific groups (gender, Indigenous, immigrant). A summary of the main conclusions is provided in section VII, and in section VIII we make suggestions for future research.

II. Data Sources

A variety of data sources is available to describe labour market earnings inequality in Australia. In this section we provide a brief description of each of the main sources (and we draw on these sources in subsequent sections).

1. Income Distribution Surveys / Surveys of Income and Housing (IDS)

Individual-level information on usual weekly earnings,² demographic characteristics and labour market experience are contained in the Income Distribution Surveys conducted by the

¹ See Borland and Norris (1996) and Borland (1999a) for earlier reviews of earnings inequality. Leigh (2013) provides a general review of income inequality in Australia.

² Actual weekly earnings are provided in the IDS in 1982.

Australian Bureau of Statistics (ABS) in 1982, 1986 and 1990, and from the Surveys of Income and Housing (SIH) from 1994/95 to 2013/14 (every one or two years).³

2. Labour Force Surveys (LFS)

The ABS has provided summary statistics on the distribution of usual weekly earnings for employees in an annual publication from 1975 to 2014. This earnings information was collected in the Employee Earnings, Benefits and Trade Union Membership (EEBTUM) Survey conducted as a supplement to the standard LFS in August each year. The EEBTUM was discontinued in 2013, with earnings information now collected via the Characteristics of Employment (COE) Survey, also an August supplement to the LFS.⁴

3. Employer Surveys (ES)

The ABS has provided summary statistics on the distribution of weekly earnings for employees in annual publications from 1975 to 1996 and biennial publications from 1998 to 2014.⁵ This information is collected from employers, using the Survey of Employee Earnings and Hours (EEH). Consistent information on the distribution of earnings among full-time employees has only been provided for non-managerial workers on adult rates of pay.

4. The Household, Income and Labour Dynamics in Australia (HILDA) Survey

This Survey collects a substantial amount of information (including on earnings) on the same sample of individuals annually from 2001 to 2014 (that is, HILDA is a longitudinal or panel survey). Individual-level information is provided to researchers which allow the construction of earnings inequality measures directly.

5. Australian Tax Office (ATO)

The ATO has provided tables on the distribution of reported taxable income and/or total income classified into intervals from 1921 onwards. This allows the construction of

³ The Household Expenditure Survey (HES) has been collected with the SIH in recent years (2003-04 and 2009-10). The HES was also collected in 1975-76, 1984, 1988-89, 1993-94 and 1998-99, and provides individual information on income and expenditure.

⁴ Information from 1975 to 2013 is provided in ABS catalogue no.6310.0; and from 2014 onwards in catalogue no. 6333.0.

⁵ These are provided in ABS catalogue number 6306.0.

inequality measures from that time (see Leigh, 2005). The ATO has also provided an annual cross-section sample of individual tax return data since 2004.

Apart from these five data sources, we also use information provided by the ABS for a sub-sample of individuals taken from the 5-yearly Censuses. While this data source is not ideal for constructing estimates of overall earnings inequality,⁶ we use it to calculate income and employment differences between various sub-groups of individuals: education level, age, gender, immigrant status and indigenous status.

III. Employment and Hours

Hours of work and income

A worker's labour market income depends on the amount of work they do, as well as on the rate of pay. Differences in the amount of work therefore are potentially a source of inequality in labour market income. Figure 2 makes this point by displaying the average weekly hours of work for households (head and spouse) classified by their decile in the distribution of total household current weekly income. Hours of work by households are clearly ordered by their position in the income distribution – and most especially households in the bottom 20 per cent of the income distribution work much shorter hours.⁷ This matches the finding from previous research that the unemployed and long-term unemployed are concentrated in the bottom quintile of the income distribution (Harding and Richardson, 1998).

Long-run changes

Over the last 50 years Australia's 'male breadwinner' labour market - with most jobs being full-time and filled by males or single females - has been gradually disappearing, with the rise of female and part-time employment. Table 1 shows the shares of total hours accounted for by male and female full-time and part-time employment between 1975 and 2015. The overall distribution of hours of work has been affected by two main forces that have worked in opposite directions: first, a rise in the employment/population rate means that employment is more evenly distributed amongst the population; but second, amongst those employed there is

⁶ Labour market earnings information is not provided separately from other sources of income, and income is provided in broad categories only.

⁷ While single adult households are more prevalent in the bottom household income deciles, and adults in such households work fewer hours on average, a strong relation exists even among two-adult households.

greater inequality in hours worked due to the growth of part-time employment. Obviously, the other major distributional change that has occurred is a less uneven distribution of hours of work by gender.

Consequences of part-time work

The welfare consequences of changes to the distribution of work, such as the growth of part-time employment, will depend partly on whether actual hours of work reflect the preferences of workers or to some degree are constrained by the extent of labour demand. Figure 3a shows the rate of under-utilisation of labour and the rate of unemployment in Australia from 1978 onwards. A major trend that is evident is the growth in under-utilisation relative to unemployment; that is, a rise in the proportion of workers who are under-employed (employed but wanting to work more hours). Figure 3b shows the rate of under-employment by age over the same time period. The largest rise has been for workers aged 15 to 24 years. Most of that rise for the young (and hence most of the rise in under-employment at the aggregate level) is explained by the concentration of growth in part-time employment among younger workers (Borland, 2016).

The incidence of part-time employment has grown particularly among workers with low education attainment; and for males this has also been against a background of a declining rate of employment for that group. Figure 4 documents these changes in the employment/population and part-time employment rates by level of education attainment in Australia between 1981 and 2011.

Part-time employment may not be a long-lasting source of labour market inequality if it provides a “stepping stone” to full-time employment. Cai *et al.* (2014) search for evidence of a “stepping stone” effect for Australia using the HILDA Survey, but their findings were mixed. While part-time employment yielded higher transition rates to full-time employment relative to individuals who were not in the labour force, it did not yield higher transition rates relative to those who were unemployed but actively seeking work.⁸

The quality of jobs

Another dimension of inequality in the distribution of work is differences in the quality of jobs between workers. Much attention has been devoted to the question of whether

⁸ Fok *et al.* (2013) find evidence of a “stepping stone” effect for part-time work among single mothers.

‘precarious’ employment has risen. Figure 5 shows the well-known rise in the proportion of workers (especially females) in casual employment from the mid-1980s. Less well-known, perhaps, is that the incidence of casual employment peaked in the mid-2000s and thereafter has shown little change. While growth in casual employment might suggest that jobs have indeed become more precarious, this is not the reality. Figure 6 shows the proportions of male and female workers with short and long job tenures in Australia since the early 1980s. The proportion of female workers in long duration jobs has actually increased and the proportion in short duration jobs has fallen. For male workers the proportions in long and short duration jobs have remained relatively constant. There is also some evidence that workers understand that job security has not declined. Workers’ perceptions of the chance of losing their job appear to be mainly responsive to business cycle conditions, and so for example, decreased during the 2000s (Borland, 2014).

As with part-time employment, casual employment may act as a “stepping stone” to permanent positions. Buddelmeyer and Wooden (2008) indeed find such “stepping stone” effects for males but not females in Australia. Even among females, however, casual employment was positively related to being employed in the future relative to non-employment. In a similar vein, Buddelmeyer *et al.* (2010), Cai (2014) and Fok *et al.* (2015) investigate whether low-pay jobs act as a “stepping stone” to higher pay jobs or lock individuals into a cycle of low-pay jobs and unemployment. While Cai (2014) found evidence of both stepping stone effects and state dependence, Fok *et al.* (2015) found no stepping stone effect among males with low levels of education. Buddelmeyer *et al.* (2010) found that low-pay jobs only had a modest effect on future unemployment probabilities relative to high-pay jobs.

IV. Earnings

This section reviews evidence on inequality in earnings among employed persons in Australia. First, descriptive information on trends in earnings inequality is presented. Second, the sources of changes in inequality are examined. Decomposition analysis is used to identify the role of education attainment, work experience and occupational status in explaining rising inequality. That analysis is linked to studies on the effects of technological change and changes to labour market institutions. Third, evidence on earnings mobility and on earnings of the very rich in Australia is reviewed.

In this section the objective is to abstract from inequality in labour market earnings that is due to differences in the amount of work done, and instead to focus on differences in the amount workers are paid for their labour. The most natural way to do this would be to examine the distribution of the hourly wage. However, in most of the available Australian data sources it is the distribution of weekly earnings rather than the hourly wage that is reported. Hence the usual approach, which we follow, is to restrict attention to full-time workers. Making this restriction is intended to ensure that, to the greatest degree possible, changes in inequality in the distribution of weekly earnings represent shifts in the relative hourly wage received by workers rather than in their hours worked.⁹ We also focus on employees and exclude the self-employed in order to obtain the most precise measure of the market return to workers' skills.

Earnings inequality among full-time employees

This sub-section presents descriptive statistics on trends in inequality in weekly earnings among full-time employees in Australia between 1975 and 2014. Figure 7 presents summary information from the LFS on changes in real weekly earnings by initial earnings decile for 1975-1993 and 1993-2014. Figure 8 provides a more detailed time-series picture of changes in the 90/50 and 50/10 percentile earnings ratios¹⁰ using the first three main data sources on earnings. Figure 9 uses OECD data to compare trends in the 90/50 and 50/10 earnings ratios in Australia with the US, UK and Canada.

Several main findings can be drawn from these trends in earnings inequality in Australia:

1. There has been steady growth in inequality in weekly earnings since the mid-1970s. For example, Figure 7 shows that the rate of increase in weekly earnings was positively correlated with a worker's position in the distribution of earnings both between 1975 and 1993, and from 1993 onwards.¹¹ The main difference between those periods is that workers at all points in the distribution of earnings obtained higher rates of increase in their earnings after 1993 than prior to that time.

⁹ Borland and Kennedy (1998, Table 5) show that weekly earnings and hourly wages yield similar results on changes in inequality for full time workers.

¹⁰ These refer to the ratio of log earnings of individuals at the 90th percentile of the earnings distribution to those at the 50th percentile (top of distribution) and the ratio of the 50th percentile to the 10th percentile (bottom of distribution).

¹¹ Leigh (2005, 2013) examines tax data on male incomes and also finds evidence of consistent growth in inequality from the mid-1970s.

2. The largest increases in earnings inequality have occurred in the top half of the earnings distribution. Growth in inequality has been particularly pronounced for male workers at the top of the earnings distribution since the mid-1990s. Between 1993 and 2014 the 90/50 earnings ratio for males using the LFS increased by .35 whereas the 50/10 earnings ratio rose by only .1.
3. Trends in inequality are highly consistent across the three data sources. The main exception is the 50/10 earnings ratio for females. The LFS and IDS show little change in inequality, whereas the ES shows a large rise. This appears to be explained by a composition effect that reflects the different age ranges of workers included in each survey.¹²
4. Increases in earnings inequality in Australia since the early 1990s appear to be comparable to those in other Anglo-American countries. Large increases in the 90/50 earnings ratio were common to the four countries. Increases in the 50/10 ratio occurred in Australia and the US, but not in the UK or Canada.

Sources of changes in earnings inequality

What have been the causes of increases in earnings inequality in Australia? To answer this question, a common approach is to begin with a model of the determinants of workers' earnings at a point in time, and to examine whether changes over time in those determinants can explain changes in earnings inequality. The model includes a worker's observable characteristics and the monetary return to those characteristics (for example, years of schooling and the return to an extra year of schooling).

Using this approach, it is possible to decompose changes in inequality between the effects of:

- (i) changes in the distribution of observable characteristics in the workforce;
- (ii) changes in the monetary return to observable characteristics; and

¹² The LFS and IDS include all workers aged 15 years and above, but the ES data only includes adult workers aged 21 and over. Between 1982 and 2013 there was a large fall in the proportion of the female full-time workforce aged 15 to 20 years, and these young workers were typically low paid. Because those workers are excluded from the ES, the change in the age composition did not affect the ES measure of inequality. However, average wages of low paid workers in the LFS and IDS will have increased over time due to the age composition effect, which will have narrowed those 50/10 measures of inequality. The same age composition effect is somewhat evident for males, but not to the same extent.

- (iii) changes in earnings inequality within groups of workers with the same observable characteristics.

The ‘standard’ human capital approach to undertaking this decomposition uses education attainment and age (or work experience) as the main observable characteristics of workers. In Table 2 we report the findings from the human capital decomposition of changes in earnings inequality in Australia between 1982 and 2013 using IDS data. The main finding is that increases in earnings inequality are primarily explained by increases in inequality within groups of workers in the same age range and with the same level of education attainment; that is, component (iii).¹³ Over the whole period this component of within-group inequality accounts for respectively 96 per cent and 81 per cent of the increase in earnings inequality for males and females. For females, changes in the observable characteristics of the workforce have added to earnings inequality, due to increases in the proportion of females with higher levels of education and to increases in the participation of older females in the workforce. This effect, however, is partly offset by a decrease in the monetary return to higher levels of education.

A perspective on why changes in the monetary return to workers’ characteristics do not explain much of the increase in earnings inequality can be gained by examining relative earnings between workers with different levels of education attainment. Figures 10a and 10b show relative earnings for different levels of education attainment respectively for male and female employees between 1981 and 2011. The main feature is a tendency towards a slight narrowing of earnings differentials – in the 2000s for males and since the 1980s for females.

This stability in earnings differentials by education group in Australia contrasts starkly with the sharp increase in the college / high school wage gap in the US (Acemoglu and Autor, 2011) and rising differentials by education in the UK (Blundell *et al.*, 2007), Canada (Boudarbat *et al.*, 2010) and Germany (Dustmann *et al.*, 2009). The most plausible explanation for the Australian experience - as argued by Borland (1996a, 1999a) and Coelli (2015) - is that the increased demand for high skill workers was offset by large increases in

¹³ Chatterjee *et al.* (2016) obtain a similar finding from analysis of changes in earnings inequality in 2000s using HILDA data.

the supply of university educated workers. The university sector expanded in Australia somewhat later than the US expansion.¹⁴

An alternative decomposition approach treats a worker's occupation as the factor that determines their earnings. Findings from a decomposition using occupations are presented in Table 3, for two separate periods: 1986 to 1995 and 1996 to 2006 (with the separation being due to a change in the ABS occupation classification system). For each time period, observed changes in the 90-10 log earnings differential (using the IDS measure), and the changes predicted by the joint effect of shifts in the distribution of employment between detailed occupations and changes in average weekly earnings between those occupations, are presented. For further description of the methodology, see Coelli and Borland (2016, pp. 20-23). Changes in the occupational composition of employment and in average earnings between occupations were both highly important in explaining increased earnings inequality in Australia between the mid-1980s and mid-2000s; that is, components (i) and (ii). For males the occupational factors explain one-half of the growth in inequality between 1986 and 1995 and three-quarters of the growth from 1996 to 2006. For females the occupational factors explain essentially all of the growth in inequality over both periods. This analysis is consistent with previous research by Keating (2003) which found that changes in the occupational composition of employment explained between one-quarter and one-third of growth in the 90/10 earnings ratio in Australia between 1989 and 2000.

Some sense of why occupational factors have been an important influence on earnings inequality can be obtained from data on changes in the occupational composition of employment. Figure 11 shows changes in the share of employment in occupations where occupations are ordered by their relative average weekly earnings in 1986. Both over the period for which we are able to perform the decomposition, 1986 to 2006 (panel a), and over a longer period from 1966 to 2011 (panel b), a distinct pattern is evident. There is strong growth in the share of employment at the top end of the distribution and a decrease in employment shares spread through the middle of the distribution. That shift in the occupational composition of employment by itself would be expected to have increased inequality in earnings.

¹⁴ Coelli and Wilkins (2009) show that changes in the qualifications conferred for specific studies (teaching and nursing in particular) have put downward pressure on earnings differentials in Australia, particularly for females. Coelli (2015) suggests that labour market institutions (e.g. minimum wages) and trade patterns (e.g. mining) may have also played a role.

The difference in findings between the alternative decomposition approaches, however, is somewhat puzzling. Of course occupation status and age/educational attainment are not perfectly correlated, so it would not be surprising to find some difference in findings. But what is unexpected is to find that changes in the distribution of employment by occupation and in average earnings by occupation appears to explain so much of the rise in earnings inequality, whereas changes by age/education attainment explain so little.

Other influences on earnings inequality

The findings from the decomposition analyses suggest that shifts in the relative demand for workers by skill level are likely to have been an important determinant of increases in earnings inequality. Stable earnings differentials by level of education attainment in the face of a large increase in the supply of workers with Bachelor degree or above has been taken to imply an increase in the relative demand for high skill workers. As well, changes in the occupation composition of employment are generally interpreted as reflecting changes in the demand for workers by the types of tasks they are able to perform.

International studies of changes in the demand for labour by skill level have examined the roles of technological change and international trade (and off-shoring). In Australia there has been relatively little analysis of this topic, and the studies that have been undertaken have focused on the effects of technological change.

In the past decade the representation of how technological change impacts the labour market has been refined. During the 1980s and 1990s, the prevailing view, known as Skill-Biased Technical Change (SBTC), was that new information technology would have a monotonic effect on the demand for labour by skill level. By substituting for tasks undertaken by low-skill workers and raising the productivity of high-skill workers, it was suggested that increased use of computers would lower the relative demand for low-skill workers and raise the relative demand for high-skill workers. In the 2000s, an alternative approach, known as the 'routinisation' hypothesis, was proposed (see Autor *et al.*, 2003). This hypothesis identifies the key characteristic of a computer as its capacity to implement commands that can be coded into routines and thus replace labour in performing routine tasks. More specifically, computer-based technologies are regarded as substitutable for workers performing tasks that are cognitive and routine (such as basic clerical jobs) or non-cognitive and routine (such as operation of basic machinery); but not for tasks that are cognitive and non-routine (such as management and medicine), or non-cognitive and non-routine (such as

aged care). Since the routine clerical and manual jobs that are being replaced by computers are generally found in the middle of the skill distribution, it is predicted that job polarisation - an increase in the share of employment in high-skill jobs, a decrease in the share in middle-skill jobs, and an increase in the share in low-skill jobs - will occur.

Coelli and Borland (2016) examine changes in the occupational composition of employment by skill level in Australia using Census data from 1966 to 2011, and find evidence of job polarisation - albeit concentrated more in the 1980s and 1990s than after that time. Using the same approaches to define skill as in studies for the US and Europe, they also show that the extent of job polarisation has been similar in Australia. Supporting evidence on job polarisation in Australia was found in an earlier study by Esposto (2011); although Wooden and Wilkins (2014) argue that there is stronger evidence of a monotonic change in the demand for labour by skill level than for job polarisation.¹⁵ Coelli and Borland (2016) go on to demonstrate that the changes in the occupational composition of employment between 1966 and 2011 are strongly correlated with a decline in the demand for workers able to complete routine tasks; for example, occupations where there has been the largest decline in employment are those where the completion of routine tasks accounts for the biggest fraction of job time. An earlier study by Pappas (2001) obtained the same result for the mid-1980s to mid-1990s.

Institutional influences are another factor that has been considered potentially important for explaining changes in earnings inequality. One example is the role of trade unions in wage-setting. Since the mid-1970s trade union density has declined by over 30 percentage points, and since union membership is known to have an equalising effect on the earnings distribution, this may have contributed to rising earnings inequality. In a study for a limited period from 1986 to 1994 Borland (1996b) indeed found that about one-fifth of the increase in inequality in weekly earnings could be explained by the decline in union density. Another example is minimum wage regulation. The extent of adjustment in the real minimum wage may be a major determinant of changes to dispersion at the bottom of the earnings distribution. Figure 12 shows the ratio of minimum weekly earnings for a full-time adult worker to the earnings of full-time adult workers at the 10th and 50th percentiles of the distribution of weekly earnings between 1978 and 2014. It is important to note that it is only

¹⁵ Coelli and Borland (2016, footnote 5) argue that the difference is explained by Wooden and Wilkins using LFS data on employment and the time period covered by their analysis.

for the latter time period, from 1997 onwards, that Australia has had a formal ‘National Minimum Wage’ (NMW); so instead for the earlier period from 1978 to 1995 the Award weekly earnings rate of a base grade metal worker is used to proxy for the minimum. The ratio of the minimum wage to earnings of workers at the 10th and 50th percentiles fell during both time periods. This may have happened partly due to a decrease in the proportion of young and low-pay full-time workers which will have raised the wage for full-time workers at the bottom of the earnings distribution. However, it may also suggest that the minimum wage did not constitute a substantial bulwark against increasing earnings dispersion. This could be explained by the fact that the proportion of workers directly affected by the minimum wage in Australia is relatively small. A notable feature of the earnings distribution in Australia is the absence of a spike at the NMW. Adopting a relatively broad definition of coverage, several studies find that the percentage of workers earning at or around the NMW is 5 to 10 per cent (for example, Healy and Richardson, 2006; and Dockery *et al.*, 2008).¹⁶

Inter-generational earnings mobility

The attitude of policy-makers to ameliorating earnings inequality is likely to depend in part on their beliefs about the origins of that inequality. Where all workforce participants begin their lives with the same opportunity to undertake education and obtain work, so that labour market outcomes mainly reflect differences in effort, there may be less concern for policy to redress inequality. However, where the opportunities for workforce participants depend significantly on factors outside their control, there will be a stronger motivation for policy intervention. One main way in which workers’ labour market opportunities may be pre-determined is by their family circumstances.

Several Australian studies have followed an international literature to examine the association between an individual’s earnings and the earnings of their father (the “intergenerational earnings elasticity”) using data from the HILDA Survey: Leigh, (2007b); Huang *et al.* (2015) and Mendolia and Siminski (2015). The most recent (and hence comprehensive) study by Mendolia and Siminski (2015) estimates that 10 percent higher father’s earnings are associated with 3.5 percent higher earnings for the son. This places Australia in the middle or lower end of developed countries in the intergenerational earnings elasticity; lower than the

¹⁶ As well, workers earning the minimum wage are spread through the income distribution and hence studies which simulate the effect of changes to the minimum wage find little impact on the distribution of income (Leigh, 2007a, p.443; and Buddelmeyer and Kalb, 2008, p.223).

Scandinavian countries, Canada, Germany and New Zealand, but higher than in France, Italy, the US and the UK. Some studies have found a positive correlation between the extent of income inequality in a country and the inter-generational earnings elasticity; known as the ‘Great Gatsby curve’ (see for example Corak, 2013). Australia’s international ranking is consistent with its level of income inequality, and quite a close fit for the Great Gatsby curve.¹⁷

A large part of intergenerational persistence in earnings is likely to be attributable to the relation between parental outcomes (education, earnings and occupation) and the education attainment of their children. Many studies have documented a strong positive relation in Australia between parental background and whether a young person is enrolled in university education. Most recently, these include Birrell *et al.* (2000), Cardak and Ryan (2009), Chapman and Ryan (2002, 2005), Coelli (2009), Le and Miller (2005), and Marks and McMillan (2003).¹⁸ There is little consistent evidence from these studies regarding whether the strength of the relation has increased over time, but it remains strong.¹⁹ In addition, Cardak and Ryan (2014) show that the relation is essentially explained by differences in high school achievement. Coming from a disadvantaged background has been found to adversely affect education attainment by reducing young people’s sense of control over their lives (Barón, 2008) and by increasing their probability of engaging in risky behaviours (Cobb-Clark *et al.*, 2012).

The very rich in Australia

A recent innovation in studying inequality has been the application of tax and other data sources to examine changes in the income share of the very rich (Piketty and Saez, 2003, is the seminal international study; for Australia see Atkinson and Leigh, 2007). As an example of this approach, Figure 13 shows the share of income received by the top one per cent of income earners in selected Anglo-American countries from 1970 onwards. In common with the other countries displayed, the share of income received by the very rich in Australia has increased, commencing from around the early 1980s. Between 1981-82 and 2013-14 the

¹⁷ There is also a small literature in Australia on earnings mobility for individuals throughout their working lives – see Gregg *et al.*, (2015), and Chatterjee *et al.*, (2016).

¹⁸ Cardak and Vecchi (forthcoming) also find that less-advantaged university students in Australia are less likely to graduate and more likely to delay completion.

¹⁹ Redmond *et al.* (2015) find little evidence of increasing intergenerational mobility since the 1970s in school completion and high school achievement.

share of income received grew from 4.4 to 8.3 per cent. While Australia has shared the same trend as the US, UK and Canada, the extent of growth in the share of income going to the top one per cent in Australia has been much less.

Figure 14 displays the average real annual incomes of several high earning occupations in Australia: CEOs, Group of Eight (G8)²⁰ Vice-Chancellors and top Commonwealth public servants; and compares their annual incomes with the cutoff to be in the top 0.1 percent of taxable annual income. For all occupations there was substantial growth in earnings between 1995 and the early 2010s – by between 80 to 150 percent. Income growth for CEOs and Vice-Chancellors was much faster prior to the GFC than after; but for top Commonwealth public servants growth has been relatively steady over time. Focusing on BHP Billiton, Pottenger and Leigh (2016) take a longer-term perspective, examining the pay of the CEO and directors from the late nineteenth century onwards. They find that their remuneration decreased relative to average earnings in Australia up until the mid-1980s, but since that time has risen rapidly.

Atkinson and Leigh (2007, p.260) speculate that the likely causes of the growth in the share of income going to the very rich in Australia are a rise in executive pay since the 1990s and falling marginal tax rates since the 1970s (which in the short-term raise the benefits to work and reduce incentives for tax avoidance; and in the medium-term can increase the share of income available for buying capital assets). Leigh (2013, pp. 66-70) attributes the rise of executive pay to globalisation, and to influences such as decreasing communication and transport costs, which have extended the potential market size and hence earning power of the top performers in many professions (see also Productivity Commission, 2010, chapter 3).

V. The impact of the labour market on the distribution of income

This section describes the consequences of changes in labour market earnings inequality for income inequality between households in Australia. Labour market earnings are a major determinant of disposable income, and therefore changes in the distribution of labour market earnings can potentially have large effects on income inequality.

Per capita labour market earnings in a household equal the sum of the labour market earnings of its members divided by the number of members. The labour market earnings of each

²⁰ This group comprises the Universities of Sydney, NSW, Melbourne, Monash, ANU, Adelaide, Queensland and Western Australia.

member are equal to their hours of work multiplied by the average hourly wage they earn. Per capita disposable income in a household is equal to the sum of its labour market earnings, capital market earnings and net government payments, divided by the number of members.

Hence, changes in the distribution of hours of work between households and/or changes in the relative hourly wage earned by individuals across households, via their effect on the distribution of labour market earnings, can potentially affect the distribution of disposable income between households. Changes in household composition, or in the distributions of capital market earnings and net government payments, are other factors that can affect the distribution of disposable income.

Where the distribution of earnings from labour market and capital market activity is not uniform across households, then changes in the proportions of total earnings accounted for by those categories will also affect the distribution of disposable income between households. Therefore, the share of total earnings allocated to labour (or capital) is often used as a summary distributional measure.

We begin by evaluating evidence on how changes to individual-level earnings inequality have affected the household distribution of disposable income in Australia, and then document the evolution of labour's share of income. Our objective in this section is to describe how developments in the labour market have affected the distribution of income, not to provide a thorough survey of topics relating to the distribution of income.

The effect of inequality in labour market earnings on the distribution of disposable income

The evidence on the relation between changes in labour market income inequality and inequality in disposable income is examined for two time periods: the early 1980s to mid-1990s, and since the mid-1990s.

Representative findings for the early 1980s to mid-1990s are provided by Johnson and Wilkins (2004) and reproduced in Figure 15, and also by Harding (1997), reproduced in Panel A of Table 4. During this period there was an increase in inequality in the distribution of labour market income by household, primarily due to two main influences.²¹ First, economic downturns in the early 1980s and the late 1980s/early 1990s caused the labour

²¹ Similar evidence on changes to inequality in gross income between the mid-1980s and mid-1990s is provided by Valenzuela *et al.* (2014) using the HES and Athanasopoulos and Vahid (2003) using the Census.

market earnings of low income households to decline. Second, there was an increase in earnings inequality among the employed that favoured high income households. Over the same period, however, inequality in disposable income was relatively stable, especially after the mid-1980s. Growth in labour market earnings inequality therefore appears to have been offset by the equalising effects of government tax and transfer policies (see for example, Harding, 1997; Barrett *et al.*, 2000; Johnson and Wilkins, 2004; and Whiteford, 2013).

Next, we consider the mid-1990s to late 2000s. Some findings for this period, from Greenville *et al.* (2013), are reproduced in Panel B of Table 4. There has been a slight decrease in inequality in the distribution of labour market earnings between households over this period. An increasing employment rate favoured low income households, and this more than offset the effect of a continued increase in earnings inequality among the employed (Greenville *et al.*, 2013; Whiteford, 2013). One aspect of the distributional consequences of higher employment rates has been a decline in the incidence of jobless households. Figure 16 shows that the proportion of working age households where no adult occupant had a job grew by about 1.5 percentage points during the downturn of the late 1980s/early 1990s, but by the end of the 2000s this proportion had declined by about 3.5 percentage points.

Since the mid-1990s the distribution of disposable income appears to have remained stable or to have increased by a small amount until the mid-2000s, after which there is mixed evidence on what has happened. Studies using the ABS IDS and Household Expenditure Surveys (HES) have found a relatively large increase in inequality. At the upper end of estimated increases is the study by Greenville *et al.* (2013) using the HES, where the Gini coefficient is reported to have increased by 4 percentage points (see also Valenzuela *et al.*, 2014). Other studies using the IDS have estimated an increase in the Gini coefficient of about 2 percentage points (for example, Doiron, 2012; Whiteford, 2013; Bray, 2014; Dollman *et al.*, 2015). It has been argued, however, that estimates of changes to income inequality from ABS data sources may be biased upwards due to changes to survey methodology (Wilkins, 2014). Furthermore, studies using the HILDA Survey estimate an increase in inequality in disposable income over this period at the lower end of estimates from ABS data sources (Wilkins, 2014, 2015). Part of the explanation for the increase in inequality in disposable income since the mid-1990s appears to be a reduced redistributive effect of government tax and transfer policies over this period (Herault and Azpitarte, 2015, Table 2; Greenville *et al.*, 2013, p.13).

Labour's share of income

The share of income allocated to labour is a measure of how much of the returns from production are being received by workers. Figure 17 shows this measure for Australia between 1959-60 and 2014-15. Labour's share was relatively stable in the 1960s and early 1970s. The share then increased by 11 percentage points between the early 1970s and early 1980s. It decreased by 6 percentage points in the mid-1980s, was then stable until early 2000s, after which it again decreased by 6 percentage points to the early 2010s. Since that time the share has increased by a small amount.

What are the implications for the distribution of income of these changes in the labour share in Australia? A standard interpretation is to regard increases in the labour share as being associated with a lower degree of income inequality. High income households tend to derive a smaller share of their incomes from labour market earnings and a larger share from capital market earnings. Hence it is argued that a larger labour share, by reducing the relative income advantage of high income households, should lower income inequality. However, there is another important consideration. In some time periods (such as the 1970s and early 1980s) a higher labour share in Australia has come about due to a rapid increase in real wages. Those increases in real wages are generally regarded as having caused a higher rate of unemployment. Higher unemployment, by increasing the proportion of households with low levels of income, is likely to have increased income inequality. The implication is that the distributional effects of any change to the labour share of income will depend not just on the overall share, but also on how that labour income is distributed.

There has been some limited analysis of the causes of the decrease in labour's share of income in the 2000s. A decrease in the labour share implies that the rate of growth in labour productivity exceeded the rate of growth in hourly earnings (see Parham *et al.*, 2000, p.40). A major explanation for this situation was a shift in the composition of economic activity in the 2000s towards industries which are capital-intensive, primarily mining. However, there is disagreement about how much of the decrease can be explained by the composition effect, and whether other factors such as a decline in worker bargaining power were also important (see Cowgill, 2013, p.1, and Parham, 2013, p.2).

VI. Specific groups

By gender

There has been considerable growth in the female share of employment in Australia over the past several decades. Figure 18 shows that female shares of employment and of aggregate hours worked both increased by about 15 percentage points between 1966 and 2015. Females account for a smaller share of hours worked than employment due to being disproportionately in part-time jobs.

As has been well documented, the gender earnings differential narrowed considerably in Australia in the 1970s following the 1969 and 1972 Equal Pay Cases; however, since the early 1980s the differential has remained largely stable.²² This evolution can be seen in Figure 19 which shows alternative measures of the gender pay differential in Australia from 1966 to 2015.

A large number of studies have sought to establish the effect of discrimination on the gender pay differential, and how it has been affected by government policy. For example, Kidd and Meng (1997) conclude that legislative changes aimed at reducing gender-based discrimination in the labour market enacted in Australia in the 1980s had little effect on the occupational distribution of employment or the gender wage gap.

Several studies have focused on examining whether earnings of females in Australia are constrained by a ‘glass ceiling’. Miller’s (2005) study, which found that the wage difference between male and female employees was much larger at the top of the earnings distribution than at the bottom, supports the existence of such a ceiling. Kee (2006) further found that the ‘glass ceiling’ was significant in the Australian private sector, but essentially non-existent in the public sector (see also Barón and Cobb-Clark, 2010). Chzhen *et al.* (2013) found that the ‘glass ceiling’ was still evident even if estimates of the gender pay differential were constructed after controlling for self-selection into employment.

The potential contribution of the occupational composition of employment to the gender wage gap in Australia has been another major topic of investigation. The central question posed in these studies is whether females are over-represented in low-pay occupations. Coelli (2014) provides a review of the main studies, in addition to attempting to reconcile their conflicting findings. A majority of these studies have concluded that females are not over-represented in low-pay occupations in Australia. Recent studies in this category include Lee and Miller (2004), Barón and Cobb-Clark (2010) and Cobb-Clark & Tan (2011). Two studies, however, found that wages are lower in female-dominated occupations: Miller (1994)

²² See Borland (1999b).

and Wooden (1999). Coelli (2014) shows that it is differences in the level of occupational disaggregation that explains the difference in findings between these studies – specifically, that the potential contribution of occupation differences to the gender wage gap increases as occupations are classified at more detailed levels.

Some older studies have documented the level of and changes in occupational segregation in employment by gender in Australia. These studies generally used the Duncan index of dissimilarity (Duncan and Duncan, 1955); although some studies also used the more refined measure developed by Karmel and MacLachlan (1988). The Duncan index measures the minimum proportion of females (males) that would have to change jobs in order to be distributed across occupations in the same way as males (females). The Karmel and MacLachlin index measures the minimum proportion of the employed population required to change occupations in order to produce a situation where males and females are employed in the same ratio in each occupation.²³

Table 5 provides consistent and up to date measures of occupational segregation from 1966 to 2011 using both measures. The Duncan Index falls almost monotonically over the whole period, indicating some reduction in occupational segregation. The extent of segregation, however, is still large even in 2011. The Karmel and MacLachlin index rises slightly from 1966 to 1986, and falls thereafter. Measured occupational segregation may have fallen only slightly over this period, but the occupations into which males and females are concentrated have altered substantially. Coelli and Borland (2016) document considerable changes in the occupational composition of employment by gender over this period. The main changes were for females to move from low to high skill (paying) occupations, while males primarily were moving from middle skill (pay) occupations to high skill occupations, but also somewhat to low skill occupations.

By Indigenous status

The primary topic of research on labour market outcomes for the Indigenous population in Australia has been on employment status. Here, we begin by providing descriptive statistics on the evolution of the Indigenous employment rate and the gap in employment rates between Indigenous and non-Indigenous Australians, and then discuss evidence on the main determinants of Indigenous employment outcomes.

²³ The Karmel and MacLachlin index ensures that the occupational structure in the economy is held constant, whereas the more widely used Duncan index does not.

Figure 20 shows the aggregate employment/population rates for Indigenous and non-Indigenous groups, with different measures excluding and including Community Development Employment Programs (CDEP) employment. Table 6 (sections A and B) presents employment/population rates for both groups disaggregated by gender and for part-time as well as total employment. In each section for each gender group the top row shows the employment rate for the non-Indigenous population, and in the bottom row is the amount by which the Indigenous employment rate differs from the non-Indigenous rate after controlling for interactions of 5 year age categories and 5 education attainment levels. Note that these measures must be interpreted with caution, as the proportion of the Australian-born population self-identifying as Indigenous in the Census increased considerably over the period (from 1% to 3% between 1981 and 2011).

Several main features of employment outcomes for Indigenous Australians are evident. First, the Indigenous employment rate is much lower than the non-Indigenous rate. Second, there has been some convergence between Indigenous and non-Indigenous employment rates since the 1970s, although in 2011 the difference is still sizeable at around 20 percentage points. The timing of convergence depends on which Indigenous employment measure is used. Excluding CDEP employment, convergence mainly occurs in the 2000s, but when it is included, then convergence is concentrated in the 1980s. Third, there is a similar gap between Indigenous and non-Indigenous employment rates for both males and females. Fourth, among the employed, Indigenous males are more likely to be employed part-time than non-Indigenous males, with the gap increasing between 1981 and 2001, but declining since. Among females, the part-time gap fell considerably between 1981 and 1991, and then again between 2001 and 2011, such that Indigenous females are actually less likely to be employed part-time in 2011 than their employed non-Indigenous counterparts.

There is a relatively extensive literature investigating causes of Indigenous disadvantage in employment. Excellent recent reviews are provided by Gray *et al.* (2012, 2013), Altman and Biddle (2014) and the Productivity Commission (2014) (and for a major recent study see Kalb *et al.*, 2014). A common finding from this set of studies is that a large proportion (generally at least one-half) of the difference in Indigenous and non-Indigenous employment rates can be explained by differences in their observable characteristics. The main characteristics that explain Indigenous disadvantage in employment are lower education attainment, worse health status, living in areas with fewer employment opportunities, and (for

males) a higher incidence of contact with the criminal justice system. In addition, family size is an important explanation for lower labour force participation by Indigenous females.

It is also possible to provide some perspective on differences in labour market earnings between Indigenous and non-Indigenous Australians. This is done in Table 6 (Section C) which presents the difference in average log income between non-Indigenous and Indigenous full-time male and female workers. Note that this measure of income includes non-labour income. The top row shows the actual difference in log average income, and the bottom row shows the difference controlling for interactions of 5 year age categories and 5 education attainment levels. It can be seen that the average incomes of full-time employed Indigenous Australians are considerably lower than for the non-Indigenous, with this difference partly attributable to their much lower levels of education. The raw difference for males has fallen considerably over the period, but still remains sizeable. The gap among females is a little smaller, and has fallen less over time.²⁴

By country of birth

Differences in labour market outcomes by immigrant background have been well documented for Australia, dating back to the early work of Chiswick and Miller (1985). Most of this literature is focused on males. The labour market success of immigrants is closely related to their language background. Immigrants from the major English-speaking background (ESB) countries of the UK, Ireland, New Zealand, the US and South Africa have success that is comparable to the Australian-born non-Indigenous population. However, immigrants from non-English speaking background (NESB) countries do not perform as well. Chiswick and Miller (1985) report that the return to any education or work experience gained overseas is lower among NESB immigrants than among ESB immigrants or the Australian-

²⁴ Howlett *et al.* (2015) examine the non-Indigenous/Indigenous gap in labour market earnings using HILDA data for 2011. Similar to our results, they find that the gap in average annual earnings for full-time workers is about 20 to 25 per cent. Overall, they find that the non-Indigenous population has an advantage in average annual earnings of about 50 per cent over the Indigenous population, which was driven by a higher hourly wage and working more weeks during the year.

born. Thus transferability of skills has been seen as an important factor explaining labour market outcomes for immigrants.²⁵

We document differences in labour market outcomes by immigrant status in Table 7, again using Census data over the 1981 to 2011 period. Sections A and B show differences in employment outcomes, and section C presents income differences. There are essentially no differences in the employment and part-time employment rates between ESB immigrants and Australian-born, after adjusting for education and age differences.²⁶ Note that on average immigrants tend to have much higher levels of education than Australian-born, due primarily to the skill-based immigration strategy followed by the Australian government since the 1970s. Cobb-Clark (2003) finds that the early labour market outcomes of immigrants improved from cohorts entering in 1993-95 to cohorts entering in 1999-2000, most likely due to higher education levels and better English language skills held by more recent entry cohorts. Among full-time employees, average income is actually higher among ESB immigrants than among the Australian-born. The differences that are adjusted for education and age composition are lower than the raw income differences, but they are still positive, particularly among men. The lower adjusted figures are due to the education advantage held by immigrants.

NESB immigrants, however, have lower employment rates than Australian-born, particularly among females. NESB females who do work have lower part-time probabilities, but NESB men have slightly higher part-time probabilities than Australian-born. NESB immigrants also have lower average incomes among full-time employees than the Australian-born, and this difference is quite large once education and age differences are adjusted for. Given the high education levels among immigrants, their incomes should be considerably higher than Australian-born.

There is some evidence in Table 7 of NESB adjusted labour market outcomes deteriorating over time relative to the Australian-born. The causes of this deterioration are not clear. The source country composition of NESB immigrants has changed over time, from Europe to

²⁵ Linguistic adjustment was the focus of Chiswick and Miller (1995), with an additional focus on the endogeneity of income and language skills. Chiswick and Miller (2010) focus on the lower returns to education attained overseas using an over-education /required education / under-education framework.

²⁶ The raw differences were quite similar to these adjusted differences for both employment rates and part-time probabilities.

Asia in particular (see Wilkins, 2003; Clarke and Skuterud, 2013). Whether this compositional change can explain the observed deterioration is potentially a fruitful area for further research.

Recent studies of whether assimilation occurs for EBS and NESB immigrants (improving outcomes over time living in Australia) include McDonald and Worswick (1999), Preston (2001) and Breunig *et al.* (2013). These studies have focused on different estimation issues. McDonald and Worswick (1999) were mainly concerned with the separate identification of wage assimilation and cohort effects (i.e. immigrants arriving at different points in time may have different labour market outcomes). Breunig *et al.* (2013) have as their objective to control for unobserved heterogeneity using panel data. The evidence on assimilation from these studies is somewhat mixed.

Wilkins (2003) investigates changes over time in the distributions of earnings of immigrants and the native-born, rather than mean differences as in the rest of the literature. He finds that between 1982 and 1996/97 earnings inequality grew more quickly among immigrants than the Australian-born, and that this relative increase cannot be explained by changes in the characteristics (particularly education levels) of the two groups.²⁷

Antecol *et al.* (2003), Antecol *et al.* (2006), Chiswick *et al.* (2008) and Clarke and Skuterud (2013) compare immigrant outcomes in Australia with outcomes in Canada and the US. Generally immigrants to Australia have better labour market outcomes than in these other countries, but this difference is driven by Australia's strategic immigrant intake based on skills and English language proficiency. The role of minimum wages in influencing certain parts of the earnings distribution was also argued to be important in some of these studies.

VII. Summary

Over the past 30 to 40 years in Australia there has been a steady growth in earnings inequality in Australia for both male and female employees. Since the mid-1990s this growth has been most pronounced at the top of the earnings distribution. Increasing earnings inequality in Australia appears to be related to changes in the occupation composition of employment; but earnings differentials between workers with different levels of education attainment have remained stable. Technological change that has allowed workers undertaking

²⁷ Borland and Kennedy (1998) also find that earnings inequality grew more among immigrants than among the Australian-born between 1982 and 1994.

routine tasks to be replaced by machines, and institutional shifts such as the decline of trade unions, are underlying factors that seem important causes of increases in earnings inequality. Innovations in recent research on labour market inequality have been analysis of earnings of the very rich and of inter-generational mobility.

The distribution of work has gradually evolved since the mid-1960s with growth in the shares of female employment and part-time jobs, at the same time as there was a small increase in the aggregate employment/population rate. These changes have meant a more even allocation of work amongst the population, but a less even allocation amongst the employed. Growth in part-time employment is more likely to have affected workers with lower levels of education attainment, and has been associated with a rise in the incidence of under-employment.

Concerns about declining job quality are shown, at least since the mid-1990s, to be difficult to justify; for example, average job tenure has increased over this period.

Labour market inequality has mattered for income inequality. From the early 1980s to mid-1990s increased inequality in labour market income (due to higher earnings inequality and a decrease in the employment rate) caused higher inequality in gross income. From the mid-1990s to the end of the 2000s, there was little change in inequality in gross income reflecting stability in the distribution of labour market income (with the effect of higher earnings inequality being offset by an increasing employment rate).

Research on recent labour market outcomes for workers separately by gender, Indigenous status and immigrant status has documented persistent differences between these groups – for example, a continuing gender pay gap and despite some convergence a substantial gap in employment rates between Indigenous and non-Indigenous populations. Studies of the differences in outcomes between these groups have been able to consider some new potential causes – for example, the literature on the gender pay gap has moved on from seeking to identify discriminatory and non-discriminatory components of the pay gap to examining issues such as whether a ‘glass ceiling’ in pay exists for female workers and how female pay is affected by occupational segregation.

VIII. Ideas for future work

Recent research has given a relatively thorough understanding of how overall earnings inequality in Australia has changed over time. Much less is known, however, about the causes of changes in inequality. While decomposition-type analyses have provided some insights, by comparison with the international literature, there has been much less analysis of

the factors that may have affected the demand for labour, such as technological change, international trade and off-shoring. Research on these topics would therefore be a most valuable additional contribution to the literature on earnings inequality in Australia. Given the historical importance of trade unions and the regulatory framework for wage-setting in the Australian labour market much more could also be done to investigate their impact on earnings inequality. As well, while studies undertaken in the past decade mean that we now know more about topics such as the very rich and CEO earnings, there is considerable scope to further investigate these issues.

The long-run pattern of changes in the allocation of work and of the causes of those changes is well-established at the aggregate-level (for example, the rising share of part-time work). But there has been much less analysis of the implications of these changes for the overall distribution of work between households, and of how changes in the allocation of work have affected the distribution of income. This appears to be a potentially fruitful area for future research.²⁸

Using existing studies, it is possible, as we have done in this article, to interpret how changes to inequality in labour market income affected income inequality in Australia. However, in those studies that has usually not been a main objective of the analysis. Research that explicitly seeks to provide a more detailed evaluation of how labour market outcomes have affected the distribution of income in Australia would therefore be valuable.

²⁸ See for example Hall (2016) which describes changes in the distribution of work by household income level in the United States.

Figure 1: Average labour market and gross income across the income distribution, Individuals living in households with head aged 25 to 64 years, 2012-13

Source: Authors' calculations from the HILDA Survey, wave 13. Average annual labour market income and gross income for 2012-13 by decile in the distribution of equivalent (individual-weighted) household gross income for households with head aged 25 to 64 years.

Figure 2: Household average hours worked by total household income, 2013-14

Source: Authors' calculations from ABS IDS 2013-14. Working hours are the average of the hours of the household head and the spouse of the household head (if present). Deciles of weekly income distribution constructed using equivalent household income (individual weighted).

Table 1: Share of aggregate hours worked and employment/population ratio by gender, 1975 to 2015

	1975	1985	1995	2005	2015
Males					
Full-time	76.9	66.6	58.5	55.6	52.5
Part-time	1.2	1.7	6.1	6.7	7.9
Employment/Population	77.8	69.3	67.0	68.3	66.1
Females					
Full-time	16.7	25.4	25.4	25.4	26.0
Part-time	5.2	6.3	10.0	12.3	13.6
Employment/Population	39.5	42.0	49.1	53.9	55.2

Source: 1975 and 1985: ABS, Labour Force Australia, catalogue no.6203.0; 1995 to 2015: ABS, Labour Force Australia, catalogue no.6202.0, Tables 1 and 9.

Figure 3a: Rates of unemployment and under-utilisation of labour, 1978 to 2015

Source: ABS catalogue no. 6202.0, Table 22, quarterly seasonally adjusted data.

Figure 3b: **Rates of under-utilisation by age, 1978 to 2015**

Source: Authors' calculations from ABS catalogue no. 6202.0, Table 22, quarterly seasonally adjusted data.

Figure 4: **Employment outcomes by highest level of education, by gender, 1981 to 2011****A. Employment probabilities** **B. Part-time probabilities**

Source: Individuals aged 15 to 64 not in full-time study. Measures constructed using ABS CURF Microdata from the Australian Censuses.

Figure 5: Share of all workers in casual jobs, by gender, 1984 to 2014

Sources: Authors' calculations from ABS 6310.0 (1984-2013) and 6333.0 (2014). A break occurs between 2006 and 2007 as the sampling frame for questions on paid leave entitlements was changed between these years.

Figure 6: Duration of current jobs, by gender, 1982 to 2013

Source: Authors' calculations from ABS catalogue no. 6209.0.

Figure 7: Average annual percent change in real weekly earnings, full-time employees

Source: Authors' calculations from ABS LFS, catalogue no. 6310.0 (1975 and 1993) and no. 6333.0 (2014) for both genders combined. Earnings adjusted for inflation using headline CPI, from ABS catalogue no. 6401.0.

Figure 8: 90/50 and 50/10 percentile earnings ratios, full-time employees, by gender

Source: Authors' calculations: (a) IDS - calculated from ABS CURF Microdata; (b) ES nm – non-managerial employees only data from Employer Survey, ABS catalogue no. 6306.0; (c) LFS data from ABS catalogue no. 6310.0 (1975 to 1993) and 6333.0 (2014).

Figure 9: Earnings ratios, Selected Anglo-American countries

Source: OECD online statistics. http://stats.oecd.org/viewhtml.aspx?datasetcode=DEC_I&lang=en#

Table 2: Age and education decompositions of the distribution of weekly earnings

	Proportions				
	1982-1990	1990-2000	2000-2013	1982-2013	1982-2013
Males					
Actual change	0.0036	0.0825	0.0447	0.1308	
Composition	0.0004	0.0038	0.0032	0.0074	5.7%
Observed prices	-0.0041	0.0107	0.0122	0.0189	14.4%
Composition & prices	-0.0023	0.0057	0.0014	0.0048	3.7%
Within group	0.0059	0.0768	0.0433	0.1260	96.3%
Females					
Actual change	-0.0034	0.0628	0.0347	0.0941	
Composition	0.0083	0.0141	0.0198	0.0423	44.9%
Observed prices	-0.0153	0.0051	0.0044	-0.0058	-6.2%
Composition & prices	-0.0101	0.0086	0.0193	0.0178	19.0%
Within group	0.0067	0.0542	0.0154	0.0763	81.0%

Notes: These numbers are changes in the standard deviation of log weekly wages over the periods specified for full-time employees aged 15 to 64. All measures were constructed by the authors using data from the IDS. Decompositions were constructed using 3 education levels and 5-year age groups, except the 15-24 age group was combined. See Appendix 1 for further details of the decomposition.

Figure 10: **Income gaps by education attainment level, 1981 to 2011**

Source: Coelli and Wilkins (2009); with updated estimates by the authors. Ratios constructed from Census Microdata for full-time employees. PSE refers to no post-secondary education.

Table 3: **Effect of occupation composition and average earnings on the distribution of weekly earnings, 1986 to 2006**

Log earnings differential		1986-1995	1996-2006
Males 90-10	Observed change	+0.130	+0.103
	Predicted change	+0.077	+0.140
Females 90-10	Observed change	+0.037	+0.059
	Predicted change	+0.052	+0.149

Sources: (a) Observed changes from IDS data in Figure 3; (b) Predicted changes from Table 7 in Coelli and Borland (2016), full-time employees.

Figure 11: **Changes in the share of employment by occupation skill (earnings) category, 1966 to 2011**

Source: Coelli and Borland (2016, Figure 4) and authors' calculations.

Figure 12: **Minimum weekly wages relative to median and bottom decile weekly earnings, 1978 to 2014**

Sources: Minimum wage data are from Bray (2013): (a) 1978-1995 employs the metal industry award wage for grade 1 workers, (b) 1997-2014 employs the National Minimum Wage. Ratios are to full-time adult weekly earnings 10th and 50th percentiles constructed from the LFS, ABS catalogue no. 6310.0 and 6333.0 (2014).

Figure 13: Shares of income of top 1 per cent, selected countries, 1970 to 2014

Source: The World Wealth and Income Database; accessed at: <http://www.wid.world/>.

Figure 14: Real incomes of top earners in Australia, 1995 to 2014

Sources: VC series 1: Author's calculations from University Annual Reports; VC series 2: Soh (2007), Table 2 (G8 – Universities of Sydney, NSW, Melbourne, Monash, ANU, Adelaide, Queensland and Western Australia); 99.9 percent threshold data from Roger Wilkins (Melbourne Institute); Top public servant (Highest pay band in Senior Executive Service): 1995-2000: Atkinson and Leigh, 2006, Appendix Table 5); 2003-2014: Australian Public Service, *Remuneration Report 2014*, Table 6.1: CEOs: Pottenger and Leigh (2016), Figure 8. Income measured in 2013/14 prices.

Figure 15: **Inequality in household private and disposable incomes, 1981-82 to 1996-97**

Source: Johnson and Wilkins (2004), Table 2.

Table 4: **Inequality in labour market and disposable income, Gini coefficients, 1981-82 to 2009-10**

	Labour market income	Market income	Disposable income
Panel A			
1981-82	0.500	0.417	0.326
1993-94	0.537	0.476	0.320
Panel B			
1988-89	0.517	0.485	0.350
1993-94	0.569	0.530	0.360
1998-99	0.572	0.520	0.360
2003-04	0.556	0.505	0.350
2009-10	0.553	0.515	0.395

Sources: (a) Harding (1997); (b) Greenville *et al.* (2013), Figure 5 and Table 3.3.

Figure 16: **Percentage of households where no adult occupant has a job, 1988-89 to 2009-**

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Source: Greenville *et al.* (2013, Table 3.6).

Figure 17: **Labour's share of total income, 1959-60 to 2014-15**

Sources: Labour and total compensation: ABS, 5204.0, Table 46; Employees and self-employed workers: RBA; 1991 onwards: ABS, 6291.0.55.001, Table 8.

Figure 18: **Female share of employment and total hours worked, 1966 to 2015 (August)**

Source: Authors' calculations from: (a) 1964-65: Commonwealth Bureau of Census and Statistics, The Labour Force 1964 to 1968; (b) 1966-77: ABS, Labour Force Australia Historical Summary 1966 to 1984; (c) 1978-2015: ABS, Labour Force Australia, 6202.0.

Figure 19: **Ratio of female to male average earnings, full-time adults, 1964 to 2015**

Sources: Average adult minimum award rates: Gregory (1998, Table 2). Average adult hourly ordinary time earnings, full-time non-managerial employees: (a) ABS, Average Earnings and Hours of Employees, catalogue no.6304.0; (b) ABS, Employee Earnings and Hours Australia, catalogue no.6306.0. Average ordinary time weekly earnings, full-time employees: ABS, Average Weekly Earnings Australia, catalogue no.6302.0.

Table 5: **Indices of Occupational Dissimilarity across Genders**

Index	1966	1971	1976	1981	1986	1991	1996	2001	2006	2011
Duncan	0.664	0.654	0.641	0.626	0.619	0.590	0.559	0.535	0.525	0.518
K & M	0.281	0.288	0.293	0.292	0.297	0.290	0.277	0.266	0.262	0.258

Notes: These measures were constructed using occupations defined at the four digit level (ASCO1 definitions, excluding agriculture and military occupations), using the linked occupation data employed in Coelli and Borland (2016). “Duncan” refers to the Duncan and Duncan (1955) index. “K & M” refers to the Karmel and MacLachlin (1988) index.

Figure 20: **Employment/Population rate of Indigenous Australians aged 15 years and above, 1971 to 2011**

Sources: Census data are from Altman and Biddle (2014), Tables 24.2 and 24.3; and data on CDEP participants were kindly supplied by Boyd Hunter.

Table 6: Indigenous labour market differences relative to other Australian born, 1981 to 2011

	1981	1991	2001	2011
A. Employment rates				
Males				
Non-Indigenous rate	0.868	0.806	0.814	0.840
Indigenous gap (adjusted)	-0.337	-0.216	-0.211	-0.232
Females				
Non-Indigenous rate	0.533	0.612	0.670	0.733
Indigenous gap (adjusted)	-0.282	-0.250	-0.228	-0.230
B. Part-time probabilities				
Males				
Non-Indigenous rate	0.076	0.099	0.128	0.158
Indigenous gap (adjusted)	0.131	0.149	0.202	0.066
Females				
Non-Indigenous rate	0.336	0.390	0.425	0.476
Indigenous gap (adjusted)	0.239	0.085	0.065	-0.031
C. Log income of Full-time employees				
Males				
Non-Indigenous/Indigenous difference	-0.363	-0.357	-0.312	-0.253
Adjusted non-Indigenous/Indigenous difference	-0.289	-0.248	-0.179	-0.111
Females				
Non-Indigenous/Indigenous difference	-0.200	-0.279	-0.198	-0.160
Adjusted non-Indigenous/Indigenous difference	-0.093	-0.177	-0.081	-0.076

Notes: Australian-born individuals aged 15 to 64 not in full-time study. Adjusted differences constructed after controlling for interactions of 5-year age groups and 5 education levels. For employment probabilities and part-time employment rates, estimates are constructed using linear probability regressions. For income among full-time employees, interval regressions were employed as income is reported in categories in the Australian Censuses.

Table 7: Immigrant labour market differences relative to Australian born, 1981 to 2011

	1981	1991	2001	2011
A. Employment rates				
Males				
ESB adjusted difference	-0.012	-0.015	0.007	0.020
NESB adjusted difference	-0.023	-0.069	-0.067	-0.045
Females				
ESB adjusted difference	0.009	0.001	-0.012	-0.008
NESB adjusted difference	-0.015	-0.090	-0.131	-0.139
B. Part-time probabilities				
Males				
ESB adjusted difference	-0.006	0.010	0.013	-0.007
NESB adjusted difference	0.024	0.016	0.022	0.058
Females				
ESB adjusted difference	-0.010	-0.014	-0.010	-0.030
NESB adjusted difference	-0.089	-0.081	-0.059	-0.038
C. Log income of Full-time employees				
Males				
ESB raw difference	0.084	0.112	0.138	0.172
ESB adjusted difference	0.011	0.028	0.033	0.064
NESB raw difference	-0.031	-0.004	0.012	-0.024
NESB adjusted difference	-0.112	-0.103	-0.120	-0.192
Females				
ESB raw difference	0.042	0.081	0.074	0.091
ESB adjusted difference	0.009	0.025	0.016	0.027
NESB raw difference	-0.054	-0.026	-0.022	-0.013
NESB adjusted difference	-0.109	-0.098	-0.098	-0.138

Notes: Non-Indigenous individuals aged 15 to 64 not in full-time study. Adjusted differences constructed after controlling for interactions of 5-year age groups and 5 education levels. For employment probabilities and part-time employment rates, estimates constructed using linear probability regressions. For income among full-time employees, interval regressions were employed as income is reported in broad categories in the Australian Censuses.

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Table A1: **Key literature on earnings / income inequality trends for Australia**

Authors	Time-frame	Outcome measure(s)	Data source(s)
Athanasopoulos and Vahid (2003)	1986-1998	Gross income	Census, IDS
Atkinson and Leigh (2007)	1921-2003	Share of total income received by top 1%, 0.5% and 0.1% of earners	Tax records
Barrett <i>et al.</i> (2000)	1975-1994	Income, non-durable expenditure	HES
Borland (1996b)	1986-1994	Earnings, FT employees	Surveys of Trade Union Members
Borland (1999a)	1975-1997	Earnings, FT employees	IDS, LFS, ES
Coelli and Borland (2016)	1975-2014	Earnings, FT employees	IDS, LFS, ES
Harding (1997)	1982-1994	Earnings, private income, disposable income	IDS
Johnson and Wilkins (2004)	1982-1998	Earnings, private income, disposable income	IDS
Keating (2003)	1975-2000	Earnings, FT employees	ES
Leigh (2005)	1942-2001	Adult male earnings	Tax records
Valenzuela <i>et al.</i> (2014)	1983-2010	Gross income, disposable income, non-durable expenditure	HES
Wilkins (2003)	1982-1997	Earnings, FT employees	IDS
Wilkins (2014)	1993-2011	Disposable income	IDS, HILDA
Wilkins (2015)	1991-2012	Household disposable income	Census, HES, IDS, HILDA, Tax records
Wilkins and Wooden (2014)	1994-2012	Earnings, FT employees	IDS

Appendix 1: Details of the decomposition of changes in earnings inequality (Table 1)

Composition effect

To construct this effect, we use the (logged) weekly wages of individual employees in 1982, then “re-weight” the data according to changes in the age by education group distribution over time. For example, we now have more people aged 25-29 years with a bachelor degree or higher in 2013 than we did in 1982. So the weight on individuals in this group is changed between 1982 and 2013 to reflect their increased share of employment. We then construct measures of dispersion based on this re-weighted data, and calculate the changes in earnings dispersion for the re-weighted data.

Observed price effect

To construct this effect, we also begin with the distribution of log weekly wages among employees in 1982. We then adjust the log wage levels of individuals within each age by education group using the observed over time changes in real **mean** log wages within each age by education group. For example, if real log wages of employees aged 25-29 years with a bachelor degree or higher have risen on average by 0.2 log points (about 20%) between 1982 and 2013, in order to calculate a hypothetical distribution for 2013 we add 0.2 to the log wages of all employees in that particular group in the 1982. We then construct measures of dispersion based on this adjusted earnings data, and calculate the changes in earnings dispersion for the adjusted data.

Remaining “within group” effect

To obtain this effect, the first step is to adjust the 1982 log real wage distribution using **both** the re-weighting of the composition effect **and** the adjustment of the observed price effect **simultaneously**. This is the “Comp. & prices” effect in Table 1. The second step is to construct measures of dispersion based on this re-weighted and adjusted data, and to calculate the **difference** between the changes in earnings dispersion between the re-weighted and adjusted data and the measures of earnings dispersion constructed using the actual distributions of earnings observed at different points in time.

Note that the three effects do not always “add up” (that is, ‘composition’ plus ‘observed prices’ does not always equal ‘comp & prices’). This is because the effect of simultaneously re-weighting for compositional changes and adjusting wages for observed price changes can lead to changes in measured dispersion that are not the simple addition of changes in dispersion when each effect is constructed separately.

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