

# Labour Market Dynamics: Cross-country Insights from Panel Data

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This article uses household-level survey data on income and employment to compare labour market dynamics across a range of advanced economies, including Australia.<sup>1</sup> The analysis focuses on how changes in employment status are distributed within countries and how those distributional patterns vary internationally. There are many similarities across the countries studied. In particular, lower-income households are more likely to have moved into or out of employment but less likely to move region. But there are also differences across countries. For example, adults in the United States are more likely to change their employment status than in other countries examined. Furthermore, the probability of men entering and leaving employment is closer to that for women in Australia than it is in the other countries examined.

## Labour Market Performance and Characteristics

This article provides a comparison of labour market dynamics in the 2000s in Australia, Germany, the United Kingdom and the United States, prior to the global downturn in 2008–2009. It examines the distribution of changes in employment across income, age and gender. Understanding the distribution of these changes across different types of individuals and households provides insights into the reasons why changes in aggregate employment differ across countries. The distribution of changes can also have important implications for aggregate activity that may be missed by looking at the aggregate data alone; for example, aggregate consumption could decline by more if job losses are concentrated among workers from low-income households with a high marginal propensity to consume.

There were notable differences in the aggregate labour market performance of the countries

examined over the period from 2000 to 2007. For most of this time, unemployment rates in Australia and the United States were trending down, while the unemployment rate in the United Kingdom was broadly flat. In contrast, the unemployment rate in Germany increased in the early 2000s, then fell noticeably from the beginning of 2005. There were also some differences in labour market characteristics. The United States had the smallest share of part-time workers of all the countries examined over this period, at 13 per cent, whereas the share was at or above 20 per cent in Australia, Germany and the United Kingdom (Graph 1). Partly reflecting this, average annual hours worked per worker were highest in the United States, equating to around 35 hours per week, but were lowest in Germany at 28 hours per week.<sup>2</sup>

Aggregate data also contain some information about the distribution of employment. As would be expected, employment rates are highest in the prime working years (ages 25–54) across all countries in our sample, with many individuals in full-time

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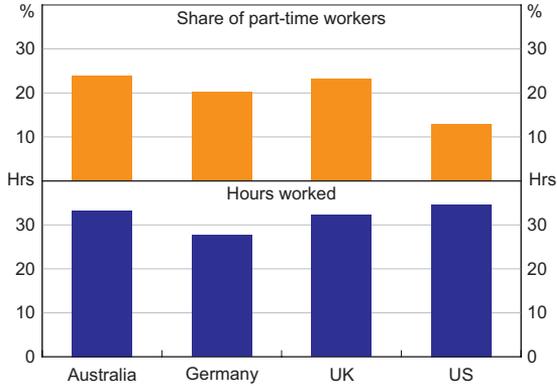
1 The data used in this article were made available to the authors by the cross-national equivalent file (CNEF) project at the College of Human Ecology at Cornell University, Ithaca, NY.

2 This will partly reflect differences in the number of public holidays and weeks of annual leave, which are generally around two weeks in the United States and four weeks in the other countries over the period of interest.

**Graph 1**

**Part-time Employment and Hours Worked\***

2001–2007 average

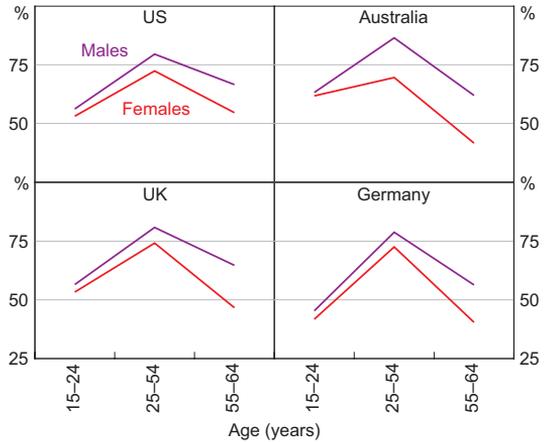


\* Hours worked in a year; average per week  
Source: OECD

**Graph 2**

**Employment Rates by Age and Gender**

2001–2007 average\*



\* 2005–2007 for Germany  
Source: OECD

study when younger than 25 years and retired when older than 54 years (Graph 2). Employment rates of women are lower than for men for almost all age groups, with the difference most pronounced in the oldest age group. The difference between employment rates of men and women is greatest in Australia for individuals over 24 years relative to the other countries examined, particularly for those of prime working age.

The cross-country differences in these aggregate employment outcomes not only reflect the state of the economy over the period of interest, but labour market institutions and policies relating to education, family support and retirement, as well as cultural norms. These factors also influence the distribution of changes in employment examined in the remainder of this article. Relative to the other countries, the United States has low unemployment benefits relative to average wages, low minimum wages and employment protection legislation that is less strict (Table 1). Government family support payments, which include maternity pay and childcare support, are also the lowest of the countries examined, which is likely to be an important cause of high rates of sole parent employment and high rates of child care usage (Table 2). Further, workers in the United States tend to retire later than in other countries, which is likely to partly reflect the low levels of retirement income relative to average

wages (Table 3). All of these factors contribute to the United States’ relatively high labour force participation, particularly of women. The exception is in the younger age group, where employment rates are partly held down by the high share of individuals in full-time education. Students in the United States are generally less likely to work than students in other countries, which in part reflects the ability of students to access loans for living expenses as well as for tuition (although this is also possible in Germany) and cultural factors.

In contrast, Germany has stricter employment protection legislation and relatively generous benefits, particularly retirement benefits which accords with its citizens tending to retire relatively early. Family benefits are relatively generous and childcare usage for children under three years old is low. Australia and the United Kingdom generally sit somewhere in between the United States and Germany on these characteristics.

**Insights from Panel Data**

Aggregate data, however, can provide only limited information about changes in the employment experience of individuals. To assess these, we use data from the cross-national equivalent file (CNEF) of panel datasets for the four countries. Since the data

**Table 1: Labour Market Institutions**  
2004

	Short-term unemployment benefit replacement rate <sup>(a)</sup>	Minimum wages share of average full-time wages	Trade Union membership	Strictness of employment protection legislation <sup>(b)</sup>
	Per cent	Per cent	Per cent of workforce	
Australia	64	50	22	1.47
Germany	74	na	22	2.39
United Kingdom	67	36	29	1.10
United States	57	25	12	0.65

(a) For a single-earner family with two children on average wage; family qualifies for cash housing assistance or social assistance top-ups if available

(b) Version 2 of this indicator; synthetic indicator of the strictness of regulation on dismissals and the use of temporary contracts, where 0 is the least restrictive and 6 is the most restrictive

Source: OECD

**Table 2: Work and Family**  
2004

	Sole parent employment rate <sup>(a)</sup>	Government family support <sup>(b)</sup>	Childcare participation under 3 years <sup>(c)</sup>	Gender pay gap <sup>(d)</sup>
	Per cent	Per cent of GDP	Per cent	Per cent
Australia	62	2.9	29	14
Germany	66	2.1	9	25
United Kingdom	53	3.2	26	23
United States	75	0.7	36	20

(a) For parents 15–64; 2006 for Australia, 2007 for other countries

(b) Government spending on child care, parental leave and other maternity payments, day care/home help services and family allowances

(c) 2005

(d) Difference between median earnings of men and women, relative to median earnings of men

Source: OECD

**Table 3: Education, Employment and Retirement**  
2004

	Education rate <sup>(a)</sup> (employment rate in education)		Age of entry to tertiary education <sup>(b)</sup>	Effective retirement age <sup>(c)</sup>	Retirement income replacement rate <sup>(d)</sup>
	Age 15–19	Age 20–24	Years	Years	
Australia	78 (47)	39 (65)	18.6	63.1	53
Germany	93 (24)	44 (45)	20.1	61.3	61
United Kingdom	69 (41)	36 (37)	18.8	63.0	41
United States	84 (26)	35 (59)	19.4	64.2	45

(a) Share of individuals in education

(b) 20th percentile of the distribution

(c) For men

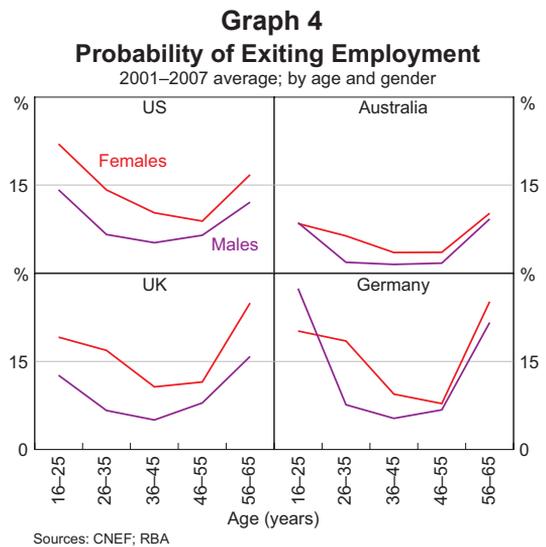
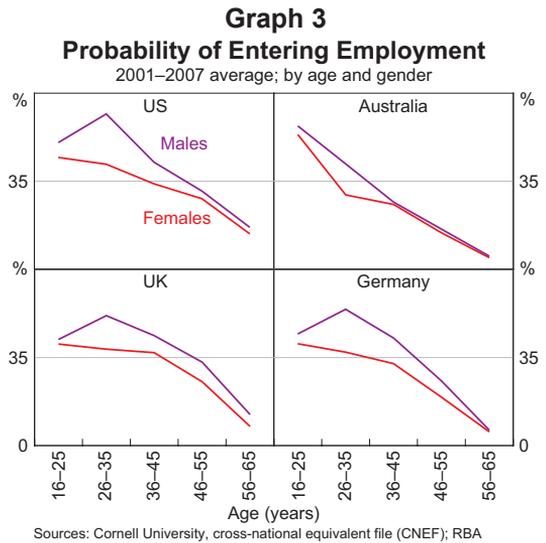
(d) For men on average wage at national retirement age; 2006

Source: OECD

are derived from a range of surveys, the availability of survey waves and some aspects of the data differ across countries (see Appendix A for more information). Nonetheless, the dataset provides key labour market variables standardised across countries along with demographic information. Since the US data are only biennial (for the sample examined), all of the labour market movement statistics cited in this article reference two-year periods; within period changes are not measured. It is also important to note that the dataset used in this analysis does not enable identification of the reasons why a particular individual's employment has changed; only the outcome is observed.

Many things about an individual's employment can change, but arguably the biggest change is entry into or exit from employment itself. On average over the early to mid 2000s, around a quarter to a third of individuals had moved from not being employed to being employed two years later. The probability of entering employment generally declines with age, reflecting the fact that young adults are more likely to be in education and then enter the workforce, and the fact that older people are more likely to have retired from the workforce (Graph 3). Entry into employment generally peaks in the 26–35 year age group for men, and in the younger age group for women, presumably reflecting the fact that the 26–35 year age group covers the key childbearing years for women, and that women are more likely than men to take time out of the workforce to look after children. The probability of 16–25 year olds entering employment is highest in Australia. This is consistent with the high rates of student employment described in Table 3, which may reflect cultural norms and the high rates of university participation in Australia (which suggests that students come from a broader cross-section of the population).

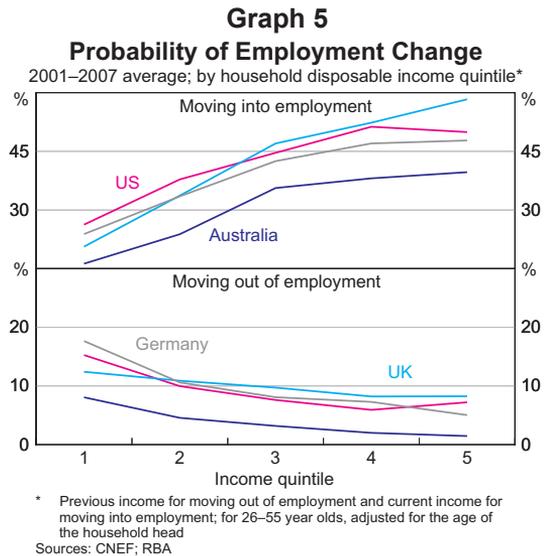
It is clear that life-cycle factors also play an important role in determining exit from employment by age and gender, with those nearing retirement age much more likely to exit employment than almost all other age groups (Graph 4). The other age group



with a high probability of exiting employment is the youngest age group; young people may leave employment to pursue study and are also the age group most likely to be made redundant (since they have a higher share of casual employment and lower levels of human capital, for example). The U-shaped relationship between the share leaving employment and age is most pronounced in Germany and least pronounced in Australia. The U-shaped distribution also tends to be less pronounced for women, with women aged 26–35 almost as likely to exit

employment as the younger age group. Overall, women are more likely to exit employment than men, with the difference particularly large in the key childbearing years of 26–35 years. The difference between the probability of exiting for men and women is, on average, greatest in the United States and the United Kingdom, with the result for the United States somewhat surprising given the high rates of female employment and child care usage. Factors other than child rearing decisions may be driving the difference, since these countries have very different levels of government support for families and the gaps also exist in the youngest and oldest age groups. Interestingly, rates of entry and exit into employment for men and women are closest in Australia, which is somewhat at odds with the aggregate data that suggest that employment rates of women are noticeably below those of men of prime working age.<sup>3</sup>

The income profiles of those entering into, and exiting from, employment also show similar patterns across countries. Focusing on employment changes by household income for prime-age individuals (aged 26–54), those from lower-income households were more likely to exit employment than those from higher-income households (Graph 5).<sup>4</sup> This relationship is most pronounced in Germany, and least pronounced in the United Kingdom. This may partly reflect the nature of the work done by these lower-income employees, which is generally less



knowledge intensive (and thus experience will not be as highly valued), as well as the greater cyclicality of the industries in which they work.<sup>5</sup> Government policies are also likely to have been influential. Excluding Germany, where the labour market performance was noticeably different to the other countries over this period, the percentage point difference between the probability of lower-income workers losing employment and higher-income workers losing employment is greatest in the United States, which has the lowest score for strictness of employment protection legislation, and lowest in the United Kingdom. Individuals from higher-income households are more likely to enter employment than those from low-income households.<sup>6</sup>

It is particularly interesting that the ranking of entry and exit rates across countries are the same; Australia has the lowest entry and exit rates, whereas the United Kingdom generally has the highest. This may seem surprising given that Australia had a low unemployment rate and labour market churn –

3 This can be reconciled by the fact that in the CNEF, employment rates of women in Australia are much closer to those of men than in the other countries studied.

4 This is because income is generally shared between household members and employment decisions of the eldest and youngest households are less likely to be influenced by income. The measure of income used is total household income equivalised for the number of people in the household (that is, household income divided by the number of people in the household where the first adult has a weight of 1, additional adults have a weight of 0.7 and children have a weight of 0.5). The income quintiles are also adjusted for the age of the household head; the income quintiles are calculated for each age group separately and then put together. With the age of the household head highly correlated with the age of the partner, using a more comprehensive measure of age makes little difference. For individuals moving out of employment, household income in the previous year is used as a benchmark, to control for the effect on income of exiting employment.

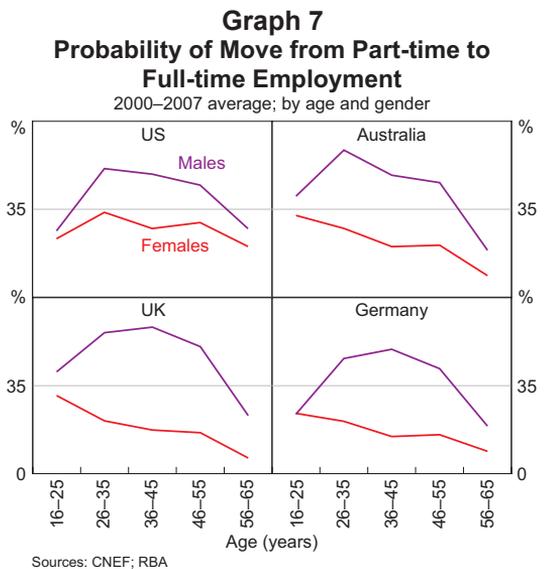
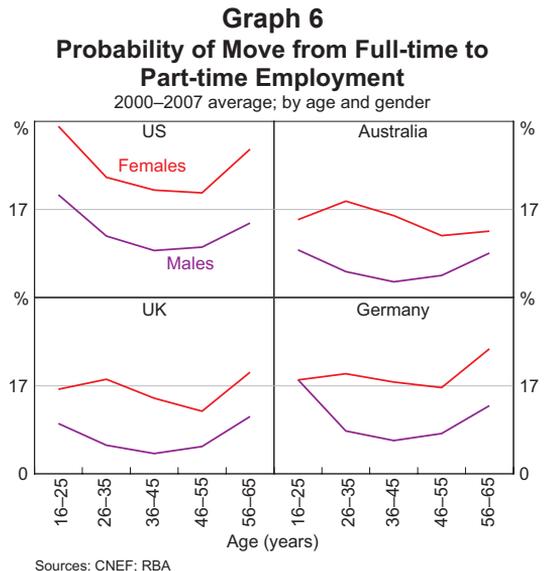
5 Importantly, the income quintiles are age-adjusted, so this controls for experience gained over a long time period.

6 This is true when both previous period and current period income (to account for the income effect of gaining work) are used. The relationship between gaining work and income is strongest when the current period's income is used, consistent with the higher opportunity cost of not working for those able to earn a high salary.

leaving one job for another – might be expected to be greater in a tight labour market. However, as noted earlier, the change in employment status is measured over two-year periods, so it may capture more non-employment for voluntary and structural reasons than for cyclical reasons.

As well as recording whether an individual is employed or not at the time of the survey, the CNEF also contains a variable that indicates whether they were employed in the previous year and, if so, whether that was on a part-time or a full-time basis.<sup>7</sup> Overall, the greatest flows between labour market states are for people moving between full-time and part-time employment, as well as for those moving from non-employment to part-time employment.

By age and gender, the results accord with a life-cycle interpretation of employment decisions. Women, particularly those in the key childbearing years, are more likely to move from full-time to part-time employment, consistent with their higher probabilities of both leaving work and being employed part-time (Graph 6). They are also more likely to move from not working to part-time employment. Men, in contrast, are more likely to move to full-time employment from part-time employment, with the relationship exhibiting an inverse U-shape across age (Graph 7). This is also true of their moves from non-employment to full-time employment. In terms of exiting employment, except in the key childbearing age group, women are as likely as men to move from full-time hours to non-employment, and less likely to move from part-time hours to non-employment than their male counterparts. Since the data examined above suggest that women are more likely to exit employment based on employment status at the time of the survey rather than average hours, this suggests that women in the labour market in the base period may be more likely to experience a short spell of non-employment (lasting for less than a year), but are less likely to experience long-term



non-employment. This is more difficult to link to particular labour market institutions, but is consistent with women taking voluntary spells out of the labour force and with evidence that women tend to be employed in industries that are less sensitive to variations in the economic cycle.<sup>8</sup>

<sup>7</sup> The variable is constructed using total hours worked over the year, so it cannot distinguish between part-time work for a full year and full-time work for part of the year.

<sup>8</sup> For example, women are more likely to be employed in the public sector than are men, whereas cyclical industries such as construction are heavily male dominated.

Workers from lower-income households are more likely to have an extended period of non-employment than individuals from higher-income households, both when preceded by full-time employment or part-time employment (Graph 8). Higher-income households are more likely to leave an extended period of non-employment, and when they do so are more likely to enter full-time employment, whereas individuals from lower-income households are more likely to work fewer hours in a year once they gain employment, consistent with these households being more likely to have spells of non-employment (Graph 9).

## Labour Market Mobility

This section examines two aspects of labour market mobility – geographical mobility and mobility across industries. The CNEF applies a standard definition of industries to each country and this article uses nine industries in total due to sample size limitations.<sup>9</sup> For geographical mobility, the CNEF includes information on where a person lives based on US states, UK regions,<sup>10</sup> the German Länder and the Australian states and territories. For the largest states in Australia, information is also available on capital cities and the rest of the state. The different sizes of the regions across the countries and the average population per region make comparison across countries more difficult to interpret, but the analysis is illustrative nonetheless.<sup>11</sup>

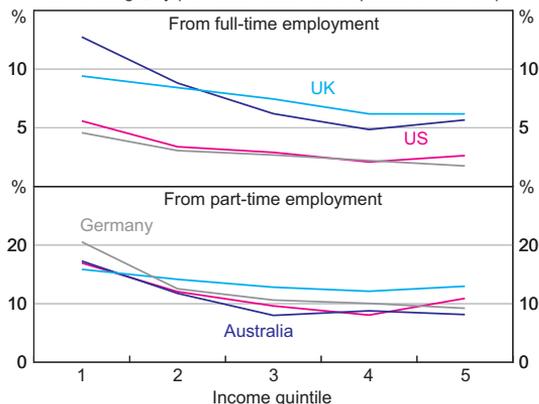
In these data, the United States and the United Kingdom have the largest share of working-age adults moving between regions, while Australia and the United States have the highest share moving between industries (Graphs 10 and 11). The differences across countries imply that the average size of a region, and by implication the distance between residences, does not explain much of the variation in geographic mobility across countries. The average size of the regions in the United Kingdom (which has high mobility) is the smallest, followed by German Länder, states in the United States (which has the highest mobility) and then Australian states are the largest (even accounting for the separation of Sydney from the rest of New South Wales and Melbourne from the rest of Victoria).

Consistent with higher geographical mobility being associated with lower financial and time costs of

**Graph 8**

### Probability of Leaving Employment

2000–2007 average; by previous household disposable income quintile\*

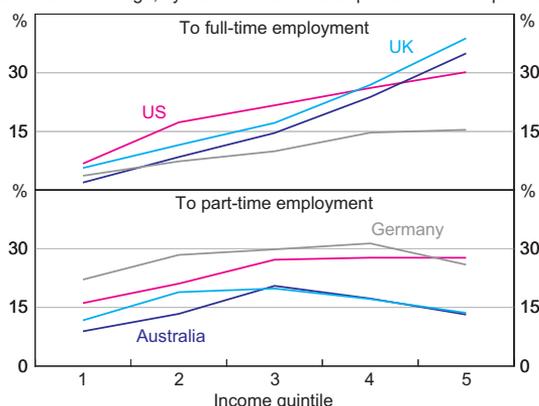


\* For 26–55 year olds, adjusted for the age of the household head  
Sources: CNEF; RBA

**Graph 9**

### Probability of Leaving Non-Employment

2000–2007 average; by current household disposable income quintile\*



\* For 26–55 year olds, adjusted for the age of the household head  
Sources: CNEF; RBA

9 The sectoral mobility figures exclude those individuals that had more than one consecutive survey where they were unemployed.

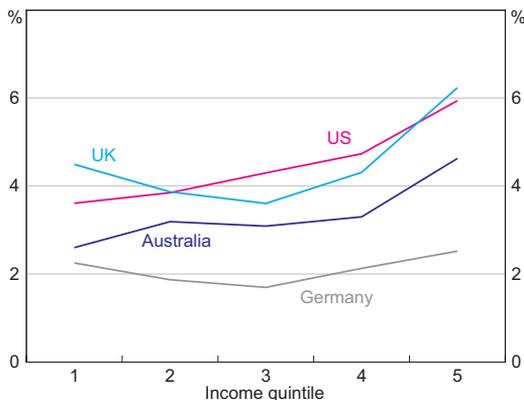
10 Regions in the United Kingdom are divided into Inner London; Outer London; Rest of South East; South West; East Anglia; East Midlands; West Midlands Conurbation; Rest of West Midlands; Greater Manchester; Merseyside; Rest of North West; South Yorkshire; West Yorkshire; Rest of Yorkshire and Humberside; Tyne and Wear; Rest of North England; Wales; and Scotland.

11 Of these, the differences in population are much smaller, with the difference at most a factor of two.

**Graph 10**

**Share of Workers who Moved Region**

2001–2007 average; by previous household disposable income quintile\*

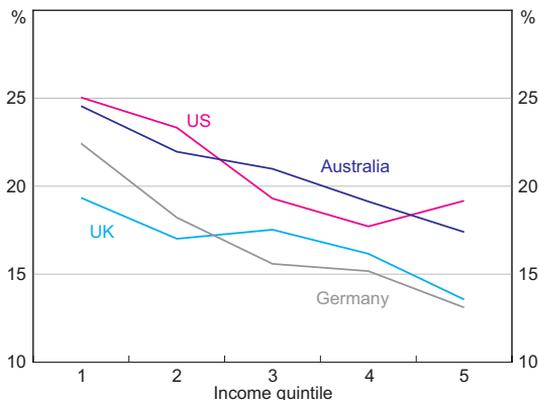


\* Adjusted for the age of the household head  
Sources: CNEF; RBA

**Graph 11**

**Share of Workers who Changed Industries**

2001–2007 average; by previous household disposable income quintile\*



\* Adjusted for the age of the household head  
Sources: CNEF; RBA

moving, such as relocating children to different schools, in all countries around three-quarters of those individuals who moved region did not have children under 16 living at home.<sup>12</sup> Individuals from higher-income households are more likely to move region, consistent with these people being better able to meet the costs of moving and, potentially, there also being higher gains from moving for these people. In Germany, in contrast, the share of households moving was roughly constant across income quintiles. Generally, 26–35 year olds were

12 The dataset only identifies children of household heads.

the most likely to move region, while 46–65 year olds were much less likely to move region. One reason for this could be that the benefits to a geographical move are realised over time and so there is less incentive for older people to move. Older people may also have more established employment and social networks, which impose a higher cost of moving, although, acting against this, they tend to have fewer dependent children living at home.

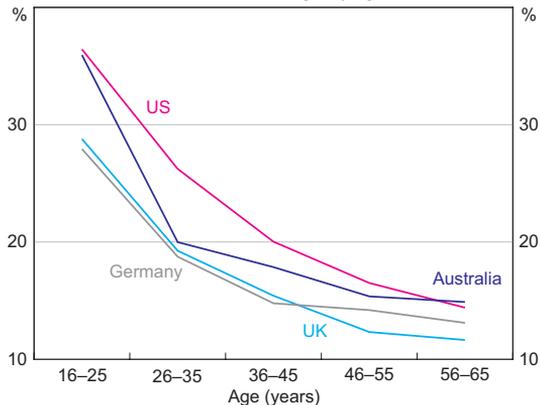
The share of workers moving from one industry to another is much higher than the share moving region, and the relationship with income is reversed, with the probability of changing industries declining with income. Given the correlation between income and education, the same relationship holds for education as well. Since age is controlled for in the income brackets, this relationship is not likely to reflect the experience of workers. Rather, it could reflect the more specialised nature of higher-income professions, which increases the opportunity cost of changing industries.

The probability of changing industries declines with age, with the probability of a 16–25 year old changing industries more than double that of a 56–65 year old in each country studied (Graph 12). As with regional moves, this could reflect the fact that the benefits to changing industries are realised over time and so there is less incentive for older people to move,

**Graph 12**

**Share of Workers who Changed Industries**

2001–2007 average; by age



Sources: CNEF; RBA

and also that the opportunity cost may be greater for older people since they are more experienced.

Surprisingly, individuals that changed industries or moved between regions do not appear to record consistently better pay outcomes than those that do not move. In Germany, the United Kingdom and the United States, individuals that change industries are less likely to record a labour income increase than those that do not change, and this relationship holds across almost all income and age groups in each year. In Australia, however, individuals from households in the lowest income quintiles that changed industries were more likely to have increased their incomes than those that did not change, while those in higher-income households were less likely to see an increase in income from a change. In all countries, individuals from low-income households that moved regions were more likely to have increased their incomes than those that did not change, while individuals from higher-income households were less likely. This suggests that moves by lower-income households tend to be motivated by economic considerations, whereas those by higher-income households may be influenced by other factors, such as the location of extended family or other lifestyle considerations.

## Conclusion

The CNEF dataset allows a comparison of the distribution of employment changes across countries. It shows that the distribution of employment changes across a range of demographic variables is broadly similar in Australia, Germany, the United Kingdom and the United States in the 2000s. Overall, individuals from lower-income households were more likely to have a change in some aspect of their employment, whether that was their overall employment status or hours worked in a year. They were also much more likely to move industry. In contrast, individuals from higher-income households were more likely to move region than those from lower-income households. Younger

individuals were more likely to have a change in some aspect of their employment, consistent with their more marginal attachment to employment and emerging family responsibilities. However, there were significant differences across countries in some areas, particularly for females, implying that government policies and social norms about labour force participation for females in families with young children are likely to be important. Employment protection policies and social benefits appear to be important in explaining the participation of lower-income households. ✎

## Appendix A

The cross-national equivalent file (CNEF) is a collection of panel datasets where the data provided has been standardised across countries. The Australian data in the CNEF are a subset of the information available in the Household, Income and Labour Dynamics in Australia (HILDA) survey, the German dataset comes from the German Socio-Economic Panel (SOEP), the United Kingdom dataset comes from the British Household Panel Survey (BHPS),<sup>13</sup> and the United States dataset comes from the Panel Study of Income Dynamics (PSID).<sup>14</sup>

Since the data are derived from a range of surveys, the availability of survey waves differs considerably across countries. Data for the United States are only available biennially from 1997, with the latest available survey for 2007 (Table A1).<sup>15</sup> Surveys for all other countries are available annually, with the Australian and German survey waves available up to 2009, and the United Kingdom survey available for 2008. Survey reference periods and collection

13 British Household Panel Survey, Data files and associated documentation, ESRC Research Centre on Micro-social Change, The Data Archive (distributor) Colchester, 2012.

14 Panel Study of Income Dynamics, public use dataset. Produced and distributed by the Institute for Social Research, Survey Research Center, University of Michigan, Ann Arbor, 2012.

15 For most surveys, the actual survey waves are available for more years, but the CNEF data are released with a lag. For example, the 2009 PSID survey is available, but not in the CNEF, reflecting the time/effort required to standardise the various country surveys.

**Table A1: Survey Data Collection and Availability**

	Survey collection period	Survey reference period for hours data	Survey begins	Survey ends
Australia	Majority Sep–Oct	Previous financial year	2001	2009
Germany	Majority Jan–Apr	Previous calendar year	1984	2009
United Kingdom	Majority Sep–Dec	Sep–Aug immediately preceding interview	1991	2008
United States	Mar–Nov	Previous calendar year	1970	2007

Sources: BHPS; CNEF; HILDA; PSID; SOEP

periods also differ somewhat, and reference periods within surveys can also differ across variables. When the hours variable is examined, the reference period differs across countries. Thus the German and United States hours data are lagged by one year when used. Data on disposable income for the United Kingdom are imputed for the 2007 survey.

The CNEF is of considerable benefit since it standardises data from the various surveys so they are more easily comparable, and also constructs variables that are not available in some of the individual surveys (of which disposable income is the most important for this article). However, the easy comparability comes at the cost of the limited selection of variables included. For example, the data only identify people as employed or not employed. There are also no data on individual or household assets or liabilities.

## Disclaimers

The data (and tabulations) used in this article were made available through the ESRC Data Archive. The data were originally collected by the ESRC Research Centre on Micro-social Change at the University of Essex (now incorporated within the Institute for Social and Economic Research). Neither the original collectors of the data nor the Archive bear any responsibility for the analyses or interpretations presented here.

The HILDA-CNEF dataset is an equivalised subset of data from the Household, Income and Labour Dynamics in Australia (HILDA) survey provided through the CNEF project at Cornell University. The HILDA Project was initiated and is funded by the Australian Government Department of Families, Housing, Community Services and Indigenous Affairs (FaHCSIA) and is managed by the Melbourne Institute of Applied Economic and Social Research (Melbourne Institute). The findings and views reported in this article, however, are those of the authors and should not be attributed to either FaHCSIA, the Melbourne Institute or Cornell University.