C Supporting data and analysis

This appendix presents a selection of supplementary data and analyses that support the discussion contained in chapters 5 and 6.

## C.1 Use of HILDA Survey data

Much of the labour market analysis presented in chapter 5 (and in parts of chapter 6) uses data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The HILDA Survey tracks the year‑to‑year movements of individuals from a nationally representative sample of households. This supplement uses HILDA Survey data from 2001 to 2010.

In using the HILDA Survey data to describe year‑to‑year changes in individuals’ employment characteristics, some limitations to the analysis are acknowledged:

* Employment data in the HILDA Survey refer to workers’ main job only, at the time of the survey. Hence, the analysis does not capture the effects of workers holding multiple jobs at the same time or changing jobs several times during a given year.
* The HILDA Survey sample could be subject to attrition bias in a way that affects measurements of labour mobility. Individuals who move location might be more difficult for data collectors to track and are, therefore, more likely to drop out of the survey. This could result in an underestimate of the rate of geographic mobility. However, the analysis focuses on transitions between consecutive pairs of years (rather than longer‑term changes from a base year), which limits the potential impact of this attrition bias.
* The HILDA Survey design is not fully representative of new migrants to the country. For most years of the survey, new migrants can only be incorporated into the survey if they join a household which is already part of the sample.
* RBA researchers — after observing that some workers appeared to change industry without having changed employer — have raised the possibility that ‘spurious industry reclassifications’ exist in the HILDA Survey dataset (D’Arcy et al. 2012, p. 11). (Analysis presented in footnote 10 of chapter 5, however, suggests that it possible for a worker to change industry without changing employer. This conclusion is supported by data presented in section C.5 of this appendix.)

The sample of respondents used to compute the estimates presented in the analyses of chapters 5 and 6 was limited to the working‑age population (aged between 15 and 64 years), for the following reasons:

* The upper age bound to 64 years controls for the effect of workers’ retirement on patterns of exit from the workforce. From age 65 onwards, workers are more likely to be exiting the workforce due to their age and eligibility for retirement benefits, rather than due to structural or cyclical changes in the economy.
* The lower age bound to 15 years is based on the legal minimum working age in Australia (depending on the jurisdiction, conditions of employment and industry). Many people who enter the workforce at this age do so while still enrolled in compulsory education. Thus, their motivation for joining the workforce may be due to reasons other than structural changes in the economy. Nonetheless, the fact that the intake of young workers is higher in some industries than in others may partly explain differences in industry expansion and contraction.

## C.2 Detailed analysis: mobility between sectors

Building on chapter 5’s analysis of workers’ mobility between sectors, the following analysis looks in more detail at the individual transitions of workers who changed sectors from one year to the next.

Using HILDA data, figure C.1 illustrates which sectors workers were moving into, and out of. For presentational purposes, transitions between 2001 and 2002 are compared only to the transitions that took place between 2009 and 2010. For each sector, represented by a horizontal bar, positive values (on the right side of the vertical axis) refer to the number of workers moving *into* that sector, while negative values (on the left side of the vertical axis) refer to the number of workers moving *out* of that sector. Within each positive or negative bar, individual segments indicate the industry that workers are arriving from or moving to, respectively. Movements into or out of agriculture and mining are excluded due to low sample counts for these sectors.

For both time periods under consideration, the sectors that workers were most commonly moving *to* were distribution, business and social services. Most of the workers joining these sectors had come out of other service sectors. The most common sectors that workers were moving *from* were distribution, business and personal services. This is indicative of the large amount of employment ‘churn’ that characterises some of the services sectors.

Figure C.1 Number of workers changing sectors between consecutive years, 2001 to 2002 and 2009 to 2010**a, b, c, d, e**

|  |
| --- |
| *Workers moving out of the sector*  *Workers moving into the sector* |
| *Workers moving out of the sector*  *Workers moving into the sector* |

**a** Positive values indicate the number of workers moving into the sector, in which case the legend denotes the *previous* sector that workers worked in. Negative values indicate the number of workers moving out of the sector, in which case, the legend denotes the subsequent sector that workers moved into. Hence, the sum of all the positive and negative values (across sectors) sum to zero. **b** Agriculture and mining sectors are excluded due to the low sample count and high standard errors associated with these estimates. **c** Estimates exclude workers who were not employed before or after their move. **d** Estimates refer to the working‑age population. All estimates are population‑weighted. e Sectors are defined in appendix A.

*Source*: Productivity Commission estimates using HILDA Survey 2001–2010, Unconfidentialised Release 10.1.

Some comparisons in workers’ transitions between the different time periods point towards some key structural shifts in the composition of the economy between the two transition periods. For instance:

* The sector which experienced the largest jump in the number of workers it attracted from other sectors was social services (and, within this sector, especially Health care and social services).
* Between 2001–02 and 2009–10, the number of workers moving *out* of manufacturing and into another sector barely changed. However, the number moving *into* manufacturing from other sectors fell considerably. The lower inflow of workers into manufacturing in the most recent period helps to explain that sector’s contraction.

Given the pronounced relative decline of the manufacturing sector over time, it is of interest to identify the sectors that manufacturing workers were mainly moving to. For both time periods under consideration, distribution services was the most common destination (and, within this sector, particularly Construction and Wholesale trade (data not shown)). Utilities and construction used to be a common destination also, but this was less so during the most recent period.

## C.3 Detailed analysis: workers length of tenure

Figure C.2 compares the composition of workers within each sector in 2002 and 2010, according to their length of tenure with their current employer.

Figure C.2 Tenure with current employer, by sector, 2002 and 2010a, b

|  |
| --- |
|  |

aFor each sector, the first vertical bar refers to 2002 and the second vertical bar refers to 2010. b Sectors are defined in appendix A.

*Source*: ABS (*Labour Mobility, Australia*, Cat. no. 6209).

## C.4 Detailed analysis: workers joining the resources sector

Table C.1 uses HILDA Survey data to look at the previous industry of employment of workers who were joining the resources sector[[1]](#footnote-1) (from another industry) each year from 2002 to 2010. It is emphasised that these estimates should be treated as indicative only, due to the small size (and consequential high standard errors) of the sample under analysis.

Table C.1 Previous industry of workers joining the resources sector, 2002 to 2010, indicative estimates**a, b**

Per cent of joining workers, by previous industry

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Previous industry | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
| Manufacturing | 29.0 | 34.5 | 49.8 | 31.2 | 20.4 | 29.8 | 16.5 | 25.7 | 13.4 |
| Electricity, gas, water  & waste servicesc | 9.8 | – | – | 8.5 | – | – | 10.0 | – | 4.7 |
| Constructionc | 10.4 | 17.0 | 6.5 | 15.5 | 11.0 | 12.6 | 27.1 | 20.8 | 21.7 |
| Wholesale tradec | – | 20.1 | 5.7 | 2.5 | 10.4 | 2.2 | 1.8 | 3.7 | 18.1 |
| Transport, postal & warehousingc | – | 7.8 | – | 8.3 | 7.3 | 2.2 | 6.9 | 8.1 | 3.4 |
| Professional, scientific  & technical servicesc | 25.8 | 3.4 | 11.9 | 16.1 | 16.3 | 9.5 | 17.9 | 23.1 | 13.8 |
| All other industries | 25.0 | 17.2 | 26.1 | 17.9 | 34.6 | 43.7 | 19.8 | 18.6 | 24.9 |
| All industries | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

aYears in column headings refer to the second year of the transition. For example, 2003 refers to the industry of origin of workers having moved to the resources sector between 2002 and 2003. b Sectors are defined in appendix A. cEstimates in these rows should be interpreted as indicative only, due to the high standard errors in some years. – Nil or negligible. All estimates are population‑weighted.

*Source*: Productivity Commission estimates using HILDA Survey 2001–2010 Unconfidentialised Release 10.1.

## C.5 Detailed analysis: inter‑industry movements by firms

Structural adjustment can involve the reallocation of labour, capital and land between firms (chapter 1). As some firms become less profitable and eventually contract or shut down, resources are freed up for use by other, more profitable enterprises.

However, some firms can undergo structural adjustment without physically closing down, moving location or shedding employees. As the Industries Assistance Commission observed:

… not all adjustment to structural change involves movement by workers between firms and industries. An important type of adjustment to change takes place when firms change their activities without changing their employees. In response to pressures for change, firms may be able to specialise or rationalise their production lines entirely (which may involve changing industry classification). In these cases, employees retained by the firm may change their industry or occupation classification, without actually changing firms … [C]onfining the discussion of labour adjustment to movements between firms must significantly understate the adjustment capacity of the labour force … (1977, pp. 55–56)

Thus, the reallocation of labour, capital and land across industries can take place simply through the industry reclassification of some firms that have changed their main activity. Evidence of such reclassification would, therefore, indicate that structural adjustment of this type does occur in the Australian economy.[[2]](#footnote-2)

### Evidence of inter‑industry movements by firms

To investigate whether firms change industry classification over time (that is, are inter‑industry ‘movers’), longitudinal firm‑level data are required. In Australia, the two publicly‑accessible such data sources are the Australian Bureau of Statistics’ Business Longitudinal Survey (BLS), covering the period 1994‑95 to 1997‑98, and the earlier Australian Workplace and Industrial Relations Surveys (AWIRS), commissioned by the then‑Department of Education, Employment and Workplace Relations in 1989‑90 and again in 1995.[[3]](#footnote-3) The AWIRS surveys are primarily cross‑sectional surveys, but they are linked by a panel element. Both the BLS and AWIRS offer only partial coverage of the entire firm population, but their scope is sufficiently broad to shed light on the wider prevalence of inter‑industry movements (table C.2).

Table C.2 Frequency of firm inter‑industry movements over time**a**

Number of businesses that changed ANZSIC divisions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Movers | | Non‑movers | Percentage of movers |
| **Business Longitudinal Survey** | | n | n | % |
| 1995–96 | 33 | | 4 019 | 0.81 |
| 1996–97 | 39 | | 3 976 | 0.97 |
| 1997–98 | 28 | | 3 833 | 0.73 |
| **Australian Workplace and Industrial Relations Surveys** | | | |  |
| 1989‑90 to 1995b | 15 | | 683 | 2.15 |

a Unweighted estimates. b Total firm movements over a five‑year period. **n** Number of firms.

*Source*: Productivity Commission estimates based on BLS data and AWIRS panel survey data.

As is apparent from the table, a very small proportion of firms changes industry each year. Those firms tend to share a number of characteristics (data not shown). In both surveys, movers were much more likely to report a major change in their range of products and services (whether a decrease or an increase) than non‑movers. Also, AWIRS movers reported considerably more changes in their main activity, between 1989‑90 and 1995, compared to non‑movers. In both surveys, manufacturing firms were most prone to moving industries, predominantly towards wholesaling and retailing. This might reflect the decision of some manufacturers to offshore their activities, in order to focus on importing and distribution. Other common firm industry pathways were more conventional, such as from property to finance, and from retail to wholesale.

#### Implications for labour

In both the BLS and AWIRS datasets, movers were invariably smaller, employment‑wise, than non‑movers, by a factor ranging from about one third to one half. This implies that movers tend to ‘carry’ fewer employees with them across industries. Although the imperfect coverage of the data precludes definitive figures for the total number of workers concerned, a rough estimate is that between 0.31 per cent and 0.77 per cent of the whole workforce may undergo this type of transition each year, on average.

1. The terms ‘natural resources sector’, ‘Mining industry’, and ‘mining sector’ are used interchangeably in this supplement. Appendix A provides a definition of the natural resources sector and of the industries and commodities it comprises. [↑](#footnote-ref-1)
2. This form of reclassification excludes the possibility that the same firm became reclassified by the ABS from one industry to another purely as the result of the adoption of a new taxonomy of productive activities. [↑](#footnote-ref-2)
3. Although more recent, the ABS’s Business Longitudinal Database is not useable for the purpose of tracking firm inter-industry movements. [↑](#footnote-ref-3)