OCCASIONAL PAPER

Skill shortages in the trades during economic downturns

Damian Oliver

National Centre for Vocational Education Research

NCVER

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About the research

Skill shortages in the trades during economic downturns

Damian Oliver, NCVER

During the recent economic downturn, media and industry reports of skill shortages in the trades continued to appear. The intent of this paper is to examine the evidence for skill shortages in the trades persisting during the economic downturns over the last 20 years, using various indicators. These include employment growth, vacancy rates, unemployment rates, apprentice completions and occupational mobility.

Key messages

- There is no evidence of persistent skill shortages during downturns in the construction, automotive and engineering trades, and unconvincing evidence of persistent shortages in the electrotechnology and telecommunications trades, the food trades and hairdressing.
- Declining numbers of apprenticeship completions account for much of the persistent shortage in the electrotechnology and telecommunications trades during the 1990s and 2000s, but apprenticeship completions (expressed as a proportion of employment) for this trade have now recovered to pre-1992 levels. If recent completion numbers are maintained, it should be possible to avoid future skill shortages.
- Very high job churn creates the perception of persistent skill shortages in the food trades and in hairdressing. Many food tradespersons and hairdressers swap employers but remain in their occupation.

Tom Karmel
Managing Director, NCVER

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Introduction

In 2008 in the midst of the Global Financial Crisis (GFC), Australia experienced its most severe economic downturn since the 1991 recession. The downturn disrupted a period of nearly 20 years of continuous growth. Accompanying this growth had been strong demand for skilled labour, with skill shortages commonplace for many professional and trades occupations during the 2000s. Resolving skill shortages became a key priority for policy-makers. Once the downturn began, there was a presumption that skill shortages would disappear; yet some reports from industry continued to claim persistent shortages in selected trade occupations.

Skill shortages arise when the supply of workers is not enough to meet the demand in a given occupation or region, at the prevailing wages and conditions (Richardson 2007, p.12). In practice, the term 'skill shortage' is widely used by employers, government and the media to describe a range of difficulties involving the supply of and demand for skilled labour. The Department of Education, Employment and Workplace Relations (2009) distinguishes three categories:

- *Skill shortages* exist when employers are unable to fill or have considerable difficulty in filling vacancies for an occupation—or if there are specialised skill needs in the occupation—at current levels of remuneration and conditions of employment, and a reasonably accessible location.
- *Recruitment difficulties* occur when employers have some difficulty filling vacancies for an occupation. There may be an adequate supply of skilled workers, but employers are still unable to attract and recruit sufficient suitable employees.
- *Skill gaps* exist where existing employees lack the required qualifications, experience and/or specialised skills to meet the firm's skill needs for an occupation. Skill gaps may apply to new employees, or where employers are unable to find suitable applicants for an occupation and recruit workers who need further training and/or experience to meet the firm's skill needs for the occupation.

In the first category, a skill shortage clearly exists as there is an insufficient supply of potential workers with the necessary skills. Under the second set of conditions, employers may perceive that a skill shortage exists, even though there is a sufficient supply of skilled workers, because they experience difficulty attracting and recruiting labour. Perceived skill shortages are most likely to be felt in industries with high turnover, since employers will be constantly engaged in recruiting new workers, even when workers who have left one firm to work in another remain within the same industry. A perceived skill shortage may also arise where the available supply of skilled labour is systematically understated. This distinction between a true skill shortage and a perceived skill shortage is central to this report.

At the height of the downturn, sharp increases in unemployment were recorded. Yet, skill shortages, according to the above characterisations, continued to exist in certain occupations, despite a decline in the overall demand for labour. The KPMG Migration Survey reported in August 2009 that employers in the hospitality, energy, wholesale and manufacturing sectors were continuing to experience skill shortages and expected to maintain the recruitment of foreign workers on 457 visas to meet demand (KPMG 2009). According to the Clarius Skills Index (Clarius Group 2009), chefs remained in shortage throughout the economic downturn. Using data from the Department of Education, Employment and Workplace Relations vacancy survey and the Australian Bureau of Statistics (ABS) Labour Force survey, Clarius calculated that, even when demand for skilled labour was at its lowest in the September 2009 quarter, there was a national shortfall of 1000 chefs.

According to their model, skilled occupations where supply remained close to demand included other food trades, hairdressing, wood trades, automotive and metal. Skill shortages were more widespread during 2008 than they had been during previous downturns.

This report considers those skill shortages that apparently persist during economic downturns. We first use available data to identify whether any trades occupations have consistently experienced shortages during the three most recent economic downturns (1992, 2001 and 2008). The data clearly demonstrate that skill shortages in the construction, engineering and automotive trades are linked to the economic cycle. There is some evidence of persistent skill shortages in the electrotechnology trades, the food trades, and in hairdressing, but it is neither consistent nor overwhelming.

We look more closely at these three trades to assess whether the evidence that does exist points to genuine skill shortages—where there is an inadequate supply of labour—or whether in fact these are perceived skill shortages. In the case of electrotechnology trades, we find it is the former, as it took nearly 20 years after the 1990s recession for apprenticeship completions to return to pre-1992 levels. If recent increases in the number of electrical apprenticeship completions can be sustained, it may be possible to avoid skills shortages in the electrical trades in the future, at least to the same degree.

In contrast, there is no evidence that supply factors have contributed to skills shortages in the food trades and hairdressing. Apprenticeship completions as a proportion of employment in these trades are consistently higher than in other trades. Job churn is particularly high within the food trades, which may generate perceived skill shortages, even though there is an adequate supply of skilled labour available.

We hypothesise that the perceived skill shortages in the food trades arise from the high substitutability of labour, which generates high job churn. Because there is a low demand for firm-specific skills in these trades, workers are able to switch employers easily in pursuit of marginally superior working conditions. We find support for this proposition in the Job Mobility Survey data. Workers leaving jobs in these trades report leaving for better working conditions, but there are no significant changes in terms of working hours or employment status. Workers with more specific skills are more likely to remain with their existing employer, presumably because their current employer places a higher value on their skills than does the open market. This applies more to the food trades, which has a much higher proportion of unqualified workers.

The findings do not suggest an obvious solution for perceived shortages in the food trades and in hairdressing. Industry-wide improvements would not overcome the high labour substitutability. There may, however, be some strategies that firms can pursue to improve retention of their existing employees.

Identifying persistent skills shortages

In the past 20 years, Australia has experienced just three economic downturns amidst what has otherwise been a period of substantial economic growth. The most severe downturn during this period was the recession in the early 1990s, when unemployment peaked at 10.9% in late 1992 (ABS 2010a). At the time of the Asian financial crisis, Australia recorded one quarter of negative economic growth, in December 2000. Unemployment peaked at 7.1% in October 2001 before again trending downward. The Global Financial Crisis commenced in 2008 but Australia did not technically enter recession, experiencing only one quarter of negative growth at the end of 2008. Unemployment increased from 4.1% in August 2008 to 5.8% in mid-2009 before declining again in subsequent months (ABS 2010a).

Using data from each of these downturns, we examine whether any trades occupations experience persistent skill shortages. Richardson (2007, p.27) lists a number of indicators of labour or skill shortages, including rising wages, low unemployment, persistent vacancies, increasing use of temporary workers and increasing use of overtime. We use information from four sources where data are available for the whole period of interest:

- labour force data on people employed and hours worked
- skill shortage research conducted by the Department of Education, Employment and Workplace Relations
- skilled vacancy data
- unemployment data.

Employment and hours

In each of the three downturns, the number of people employed and the number of hours worked in the trades declined. Hairdressing experienced growth during all three downturns and the food trades experienced among the smallest declines in each period. In the two years leading up to August 1992, the size of the trades workforces contracted by 6.1%, whereas the managerial and professional workforces grew. As shown in table 1, the largest declines in the trades workforce were among other metal trades, the printing trades, the electrical and electronics trades, amenity horticultural trades, and metal fitting and machining trades. Employment in the building trades, the food trades and the miscellaneous trades declined to a lesser extent and employment in hairdressing and the vehicle trades actually increased over the period.

Table 1 Change in employment and hours worked by occupation, August 1990 – August 1992 (%)

	% change	
	No. employed	Total hours worked
Managers and administrators	0.3%	1.8%
Professionals	4.3%	4.6%
Para-professionals	-1.8%	-1.0%
Tradespersons	-6.1%	-7.5%
Metal fitting and machining tradespersons	*-7.9*	*-9.9*
Other metal tradespersons	*-16.5*	*-19.2*
Electrical and electronics tradespersons	*-9.4*	*-11.7*
Building tradespersons	*-5.7*	*-4.4*
Printing tradespersons	*-9.3*	*-13.0*
Vehicle tradespersons	*3.3*	*0.9*
Food tradespersons	*-2.7*	*-5.6*
Amenity horticultural tradespersons	*-9.9*	*-7.4*
Miscellaneous tradespersons	*-3.2*	*-4.7*
Hairdressers	*11.9*	*7.0*
Clerks	-4.2%	-7.1%
Salespersons and personal service workers	0.4%	-5.4%
Plant and machine operators, and drivers	-6.4%	-8.3%
Labourers and related workers	-5.6%	-8.1%
Total	**-2.4%**	**-3.9%**

Source: ABS (2010b).

The effects of the two subsequent downturns on the trades workforce were more uneven. During the 2001 downturn, the number of Australians in employment still grew, although the number of hours worked decreased slightly. In the trades, decreases were particularly severe in the electrical and electrotechnology and construction trades, as well as in the other technicians and trades category. By comparison with the 1991 recession, only small decreases in the number of engineering and automotive trades workers were recorded. The number of food trades workers increased over this period, although there was a small reduction in the total number of hours worked. Hairdressing grew in this period, both in terms of the number of workers and the total number of hours worked. During the 2008 downturn, the total number of people in employment decreased only marginally (from 10 914 690 to 10 906 184). Job losses during this time were primarily among technicians and tradespeople and machinery operators and drivers, while the number of community and personal service workers increased by 10.0% (see table 2). Among traditional trades workers, the largest decreases were in automotive and engineering and construction, returning to the pattern of the 1992 recession. Once again, food trades workers were less affected than other trades categories and hairdressing recorded increases in the number employed and the number of hours worked. Technicians and trades workers and machinery operators and drivers also recorded the largest decrease in the number of hours worked. This suggests a reduction in hours for the remaining workers as well as job losses.

Based on the employment data, we cannot conclude that any of the trades experienced skill shortages consistently during the three most recent economic downturns, with the possible exception of hairdressing. Most trades experienced reductions in the number employed and the number of hours worked. It is noted however that by comparison with the other trades, the food trades were less affected across all three downturns, recording among the smallest reductions.

Table 2 Change in employment and hours worked by occupation, August 2000 – August 2001 and August 2008 – August 2009 (%)

Occupational group	2000–01 % change		2008–09 % change	
	No. employed	Total hrs worked	No. employed	Total hrs worked
Managers	6.2	2.4	0.8	0.5
Professionals	2.9	-0.3	1.1	0.6
Technicians and trades workers	-2.0	-4.9	-5.7	-8.5
Engineering, ICT and science technicians	*5.4*	*2.7*	*-11.0*	*-12.9*
Automotive and engineering trades workers	*-0.5*	*-1.6*	*-11.0*	*-16.4*
Construction trades workers	*-2.2*	*-6.1*	*-8.9*	*-10.4*
Electrotechnology and telecommunications trades workers	*-8.6*	*-12.1*	*-3.7*	*-3.3*
Food trades workers	*2.0*	*-3.6*	*-0.5*	*-4.0*
Skilled animal and horticultural workers	*8.1*	*8.4*	*-8.4*	*-8.5*
Other technicians and trades workers	*-10.7*	*-14.2*	*10.4*	*8.1*
Hairdressers	*4.9*	*0.1*	*9.6*	*7.4*
Printing trades workers	*-40.2*	*-41.5*	*-12.0*	*-10.0*
Community and personal service workers	4.2	8.0	7.5	1.3
Clerical and administrative workers	-0.8	-3.8	-0.6	-3.0
Sales workers	-1.5	-3.3	0.3	-1.7
Machinery operators and drivers	2.2	-1.1	-5.0	-8.5
Labourers	-5.0	-8.0	0.4	-3.3
Total	**0.6**	**-1.8**	**-0.3**	**-2.6**

Source: ABS (2010b).

Skill shortage research conducted by the Department of Education, Employment and Workplace Relations

Skill shortage lists compiled by the Department of Education, Employment and Workplace Relations are based mainly on results from the Survey of Employers who have Recently Advertised (SERA). The scope of the survey is limited to those occupations which require specific skills or qualifications and for which national employment exceeds 1500. The survey asks employers if they have been able to fill recent vacancies. Vacancies are assessed as filled or unfilled after four weeks for trades vacancies, and after six weeks for professional vacancies. The skill shortage reports are produced on a state-by state basis, although they do distinguish between statewide, metropolitan and regional shortages. Based on the results of the survey, the department will conclude that an occupation is in shortage, experiencing recruitment difficulties, or is not in shortage. A national shortage is considered to exist where a majority of the states are reporting a shortage, or where shortages exist in the three largest states (Shah & Burke 2002, p.25). While non-statistical in nature, the ABS has reviewed the skill shortage methodology and concluded that it was appropriate for its purpose (Department of Education, Employment and Workplace Relations 2008).

Results from the Department of Education, Employment and Workplace Relations's skill shortage research are available from 1986 onward. However, the occupations included in the survey have changed over time and not all occupations are surveyed in every year. Therefore, an occupation may be experiencing a shortage but not be reported as such because it was not surveyed. The data reported on here only apply to national shortages, so may overlook shortages restricted to certain states or regions.

During the 1991–92 downturn there were no widespread shortages in any of the trades occupational categories. The only occupation that was reported as continuing to be in short supply was refrigeration and air conditioning mechanic (a specialised occupation in the electrical trades category). In contrast, shortages continued to exist throughout the downturn in nearly all of the health professions, namely registered nurses, occupational therapists, physiotherapists and radiation therapists. Shortages were also evident among a range of engineering occupations and among some secondary teaching specialties.

A number of trades categories experienced shortages across a number of occupations during the 2001 downturn. In the food trades, shortages of pastrycooks, and some specialisation of cooks and chefs continued, as did shortages of hairdressers. Shortages in most fabrication and automotive occupations were persistent throughout the decade. Construction was one industry that was particularly affected by the 2001 downturn (ABS 2009). The Department of Education, Employment and Workplace Relations did not consider that the primary occupations in the building and electrical trades were in shortage during the 2001 downturn.

In light of the Global Financial Crisis, the department reviewed a number of occupations in early 2009. As a result, most occupations in the trades were considered to no longer be experiencing a skills shortage. Significantly, it concluded that there was no shortage in the primary occupation in all of the trades categories reviewed: motor mechanics in the automotive trades; fitters and machinists in the engineering trades; carpenters, joiners and plumbers in the construction trades; and chefs and cooks in the food trades. Shortages were still recorded in a number of more specialised trade occupations:

- ✧ baker, pastrycook and butcher in the food trades
- ✧ automotive electrician, panel beater and vehicle trimmer in the automotive trades
- ✧ stonemason, glazier, and wall and floor tiler in the building trades
- ✧ aircraft maintenance engineers (avionics and mechanical) and locksmith in the engineering trades
- ✧ lift mechanic, air-conditioning and refrigeration mechanic, electrical linesworker, and electronic equipment trades worker in the electrical and electronic trades.

This is not surprising, given that the 2008–09 downturn had a much less severe impact on economic growth and employment than the 1992 recession, and the strong demand for skilled labour that existed prior to the downturn.

According to the department's skill shortage research, no trades category has persistently experienced skill shortages across all three recent economic downturns. All trades were severely affected by the 1992 recession. The building and electrical trades were most affected by the 2001 downturn and in 2008 only specialised trade occupations remained in shortage.

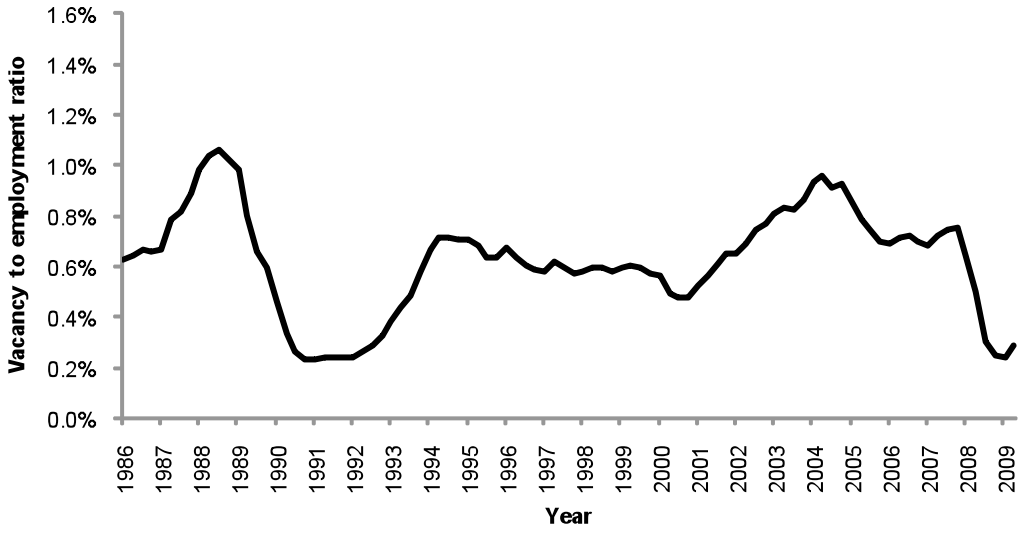
Skilled vacancy data

The skilled vacancy report is released by the Department of Education, Employment and Workplace Relations each month, based on counts of vacancies for professional and trade occupations appearing in major metropolitan newspapers. The data are not ideal as an indicator of skill shortages, since they do not capture how difficult vacancies are to fill. There is therefore no way to distinguish between occupations that experience high turnover and job churn and occupations experiencing a shortage of skilled labour. A further limitation to the index is the growing preference to advertise job vacancies online rather than in newspapers. However, historical data for the internet vacancy index are not available for the full period under examination. Therefore, while noting the limitations, data from the skilled vacancy index were used to examine changes in the number of vacancies recorded over the period 1986–2008. The number of vacancies recorded over a three-month period have been combined to match the quarterly employment

figures collected by the ABS, with the number of vacancies expressed as a proportion of total employment in each occupational category.

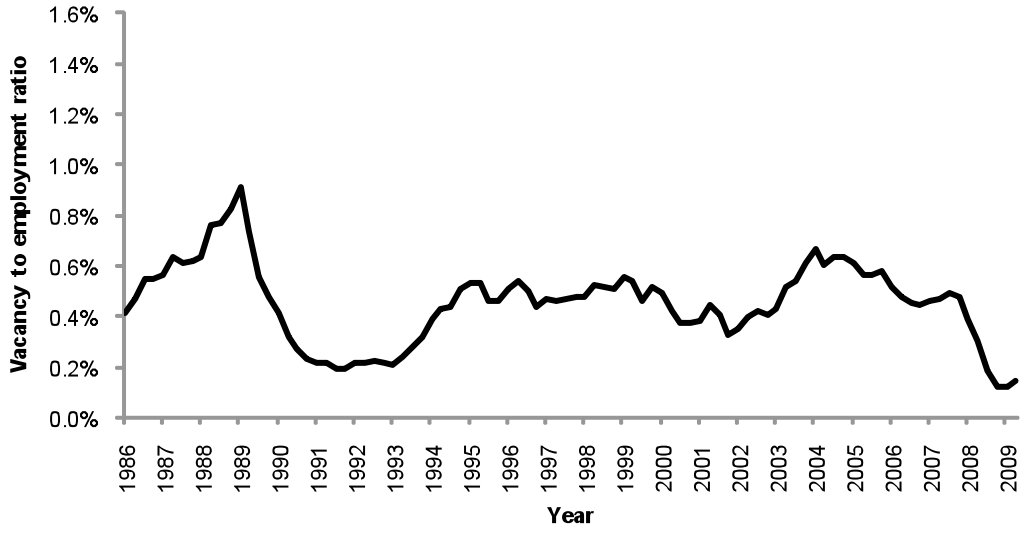
High vacancy-to-employment ratios could indicate skill shortages, but they could just as easily reflect high turnover. The food trades and hairdressing have the highest vacancy-to-employment ratios. The lowest are found in the electrical trades, followed by construction. All trade occupations examined experienced some cyclical variation in vacancy rates. The vacancy ratios from 1986 to 2008 are shown in figures 1–5. The sharp decline in vacancies for all occupations during 1991 and 1992 is evident, as is the subsequent increase in the vacancy ratio, which was more or less sustained until 2007. The principal exception is construction vacancies, which recorded decreases in 1996 and 2000. An increase in vacancies from 2000 was apparent, despite the increasing popularity of advertising vacancies online. Large declines are observable for all trades in 2008.

Figure 1 Ratio of vacancies to total employment, automotive and engineering trades, 1986–2009



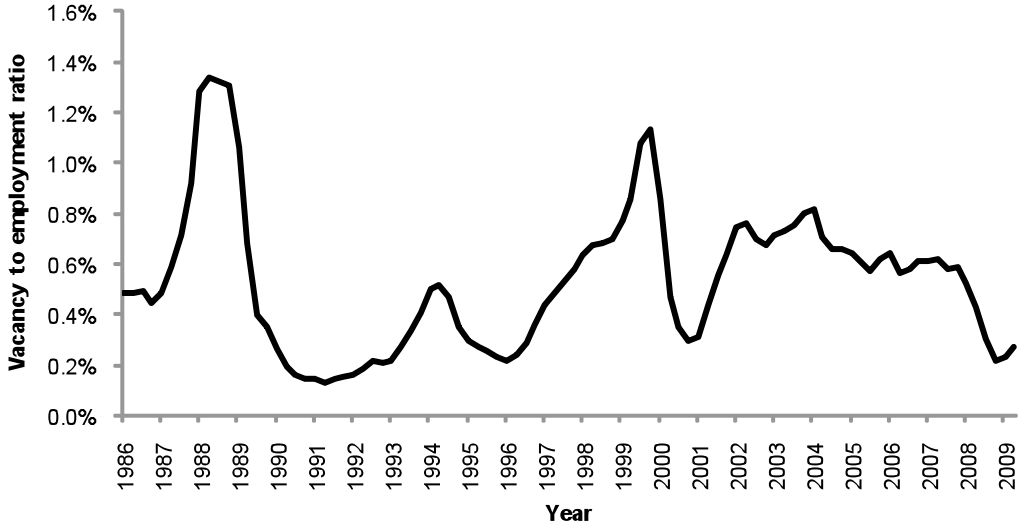
Source: Department of Education, Employment and Workplace Relations Skilled Vacancy Index; ABS Labour Force Quarterly, various dates.

Figure 2 Ratio of vacancies to total employment, electrical trades, 1986–2009



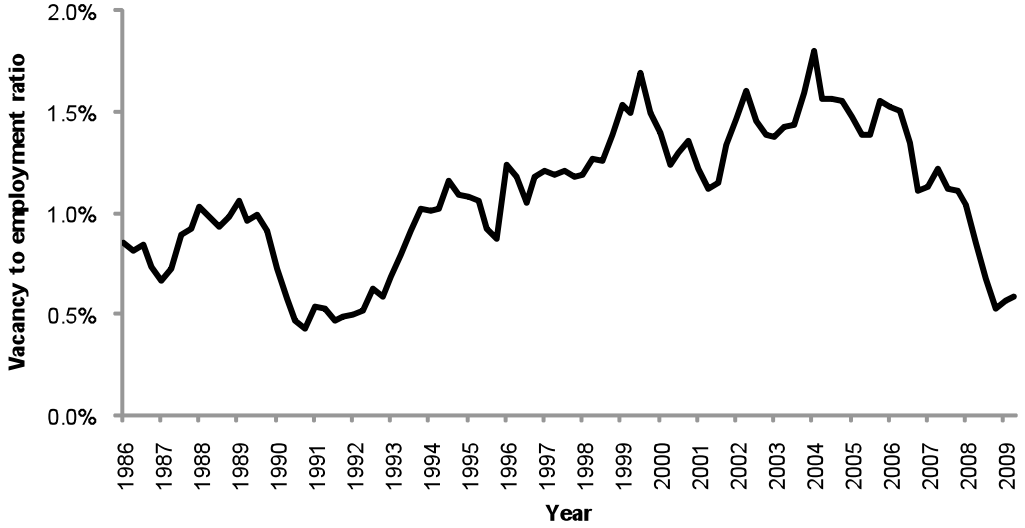
Source: Department of Education, Employment and Workplace Relations Skilled Vacancy Index; ABS Labour Force Quarterly, various dates.

Figure 3 Ratio of vacancies to total employment, construction trades, 1986–2008



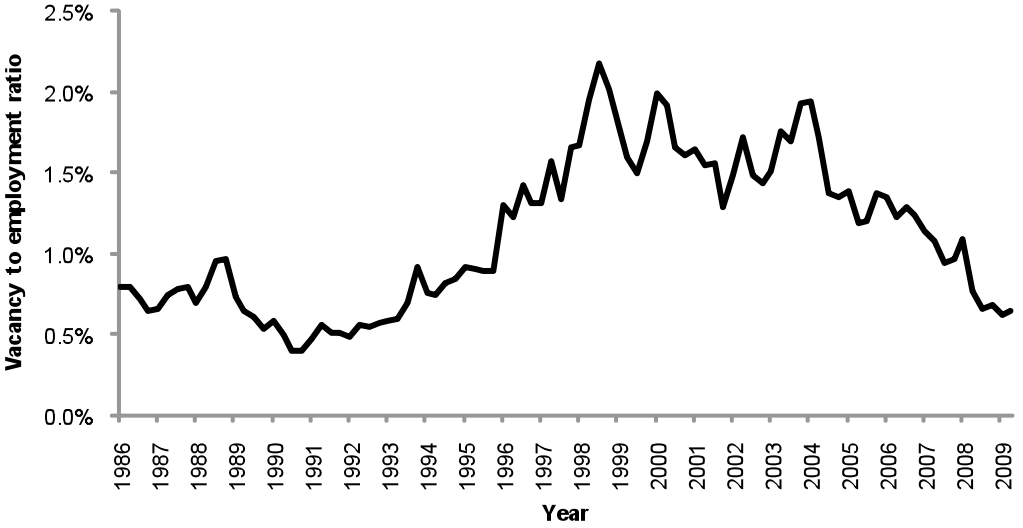
Source: Source: Department of Education, Employment and Workplace Relations Skilled Vacancy Index; ABS Labour Force Quarterly, various dates.

Figure 4 Ratio of vacancies to total employment, food trades, 1986–2008



Source: Department of Education, Employment and Workplace Relations Skilled Vacancy Index; ABS Labour Force Quarterly, various dates.

Figure 5 Ratio of vacancies to total employment, hairdressing, 1986–2008



Source: Department of Education, Employment and Workplace Relations Skilled Vacancy Index; ABS Labour Force Quarterly, various dates.

Unemployment data

Persistently low unemployment rates for a given occupation are another indicator of structural skill shortages. Large numbers of unemployed people trained to work in a certain occupation suggest that there is not a great deal of demand for those skills. The difficulty is determining what is an occupation's normal or equilibrium unemployment rate (Shah & Burke 2002, p.21). Furthermore, since employers typically report shortages for 'specialised and experienced workers', perceived skill shortages can co-exist with relatively high unemployment overall in the occupation if there are large numbers of newly trained people with little experience, or unemployed people with skills that are considered redundant or not in demand. Persistently low unemployment, though, would suggest a shortfall of technical skills.

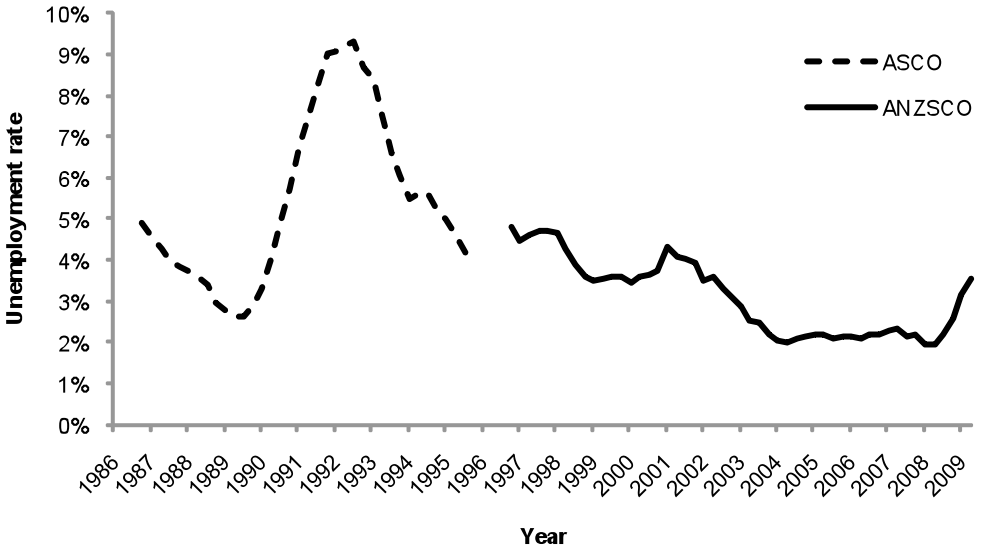
Occupation-level employment data are available from the quarterly Labour Force Survey. The data do have limitations. Unemployment rates for occupations are lower than overall unemployment rates and rates for small occupations in particular may be unreliable. A further limitation is that the jobseeker's occupation is based on the occupation held in their last full-time or part-time job. First-time job seekers and job seekers who have not worked for more than two weeks in the preceding two years are excluded. This particularly affects feminised occupations, such as hairdressing, which have a hidden pool of potential skilled workers among women who are currently out of the labour market but who are looking to return to the workforce. Workers may also be qualified to work in one occupation but be working in another. The unemployment figures therefore do not constitute a complete match of workers capable and available to work in a given occupation.

The data presented here cover the period 1986–2009. A rolling average has been calculated from the quarterly data to improve reliability. The unemployment rates are presented separately for each of the trades in figures 6–10 on the following pages. The results show that:

- ✧ Unemployment in all the trades increased in 2008–09, but in none of the trades did the unemployment rate exceed the highest unemployment rate recorded during the previous downturn in 2001.
- ✧ The trades appear to have different natural rates of unemployment, with the electrotechnology and telecommunications trades and hairdressing having the lowest average over the 23 years and food trades having the highest.
- ✧ Unemployment in the building trades is most sensitive to the economic cycle.

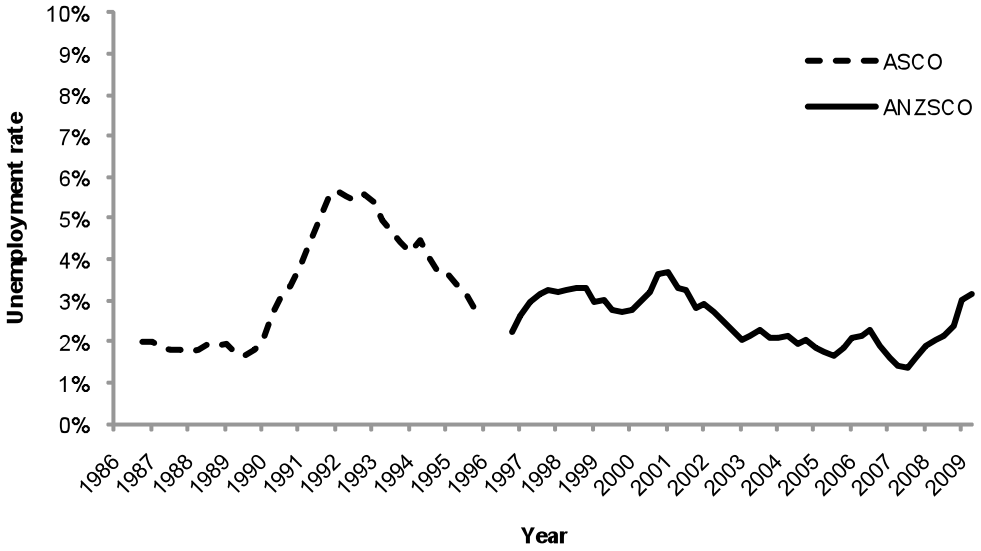
The strong economic and employment growth over the last ten years masks the fact that unemployment in all trades remains sensitive to the economic cycle. Apart from electrotechnology and telecommunications and hairdressing, which recorded the lowest minimum rates of unemployment, the unemployment data do not show that the trades experience skill shortages during economic downturns. The high average unemployment rates for the food trades suggest that the high vacancy-to-employment ratio in the food trades is more likely to be a consequence of high job turnover rather than persistent shortages in these trades.

Figure 6 Unemployment rates, engineering and automotive trades, 1986–2009



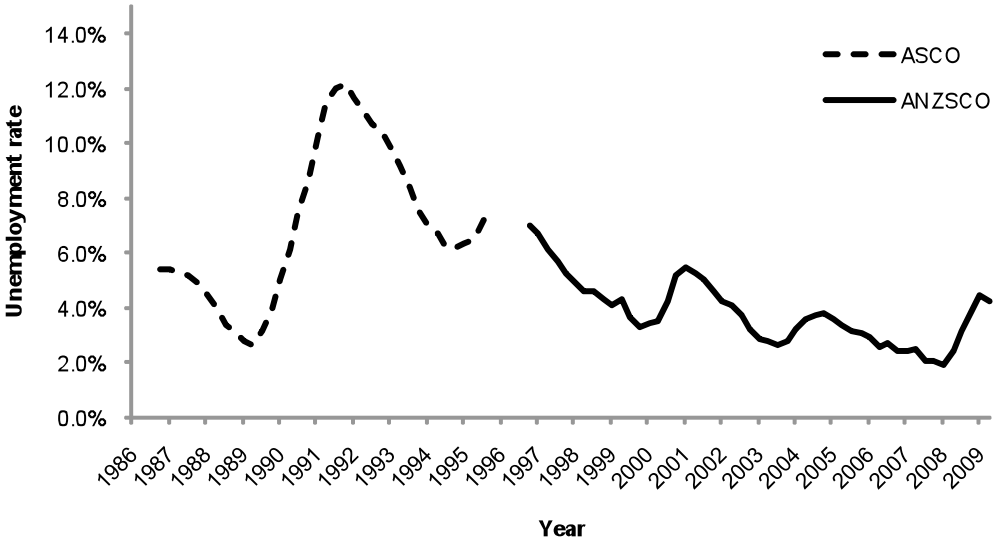
Source: ABS Labour Force Survey (unpublished data).

Figure 7 Unemployment rates, electrical trades, 1986–2009



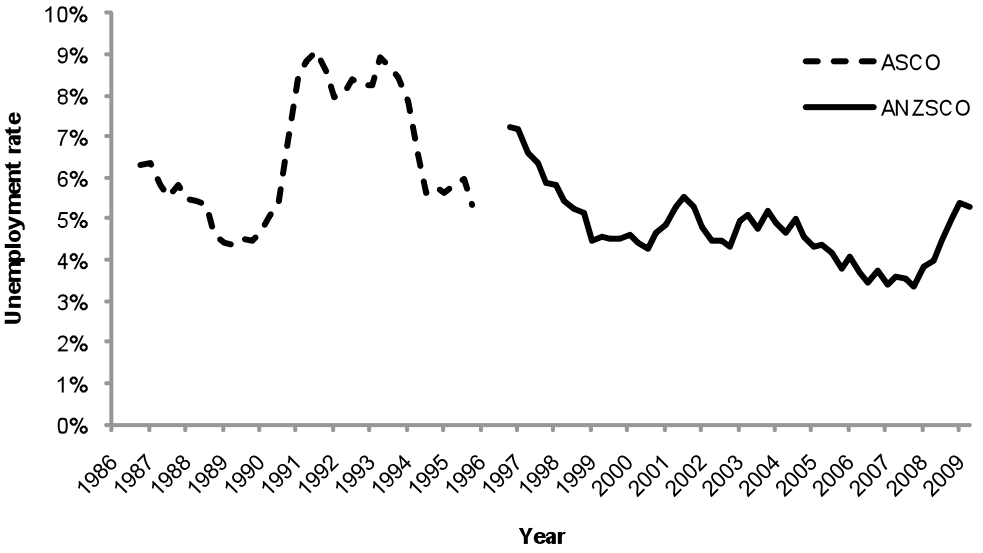
Source: ABS Labour Force Survey (unpublished data).

Figure 8 Unemployment rates, building/construction trades, 1986–2009



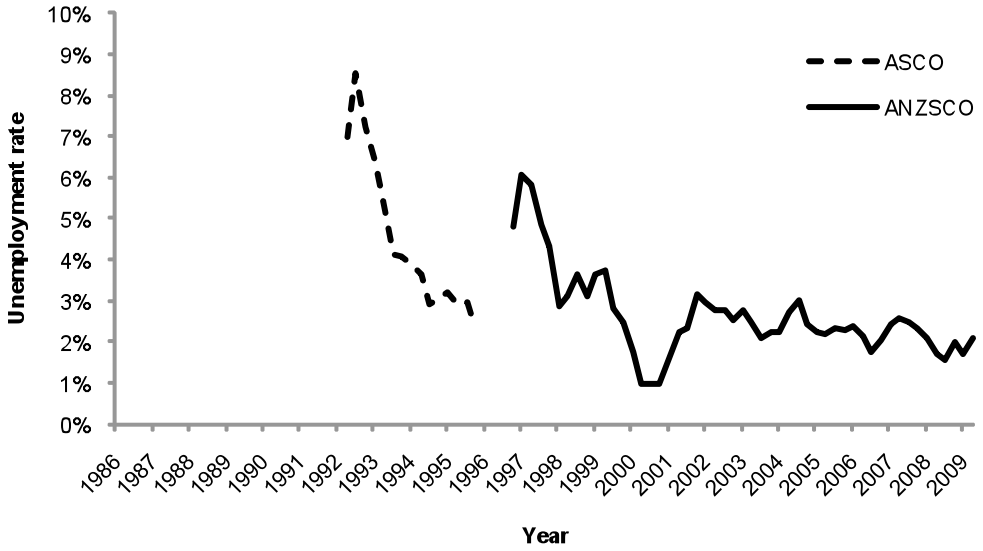
Source: ABS Labour Force Survey (unpublished data).

Figure 9 Unemployment rates, food trades, 1986–2009



Source: ABS Labour Force Survey (unpublished data).

Figure 10 Unemployment rates, hairdressing, 1992–2009



Source: ABS Labour Force Survey (unpublished data).

A ratio of labour supply to labour demand

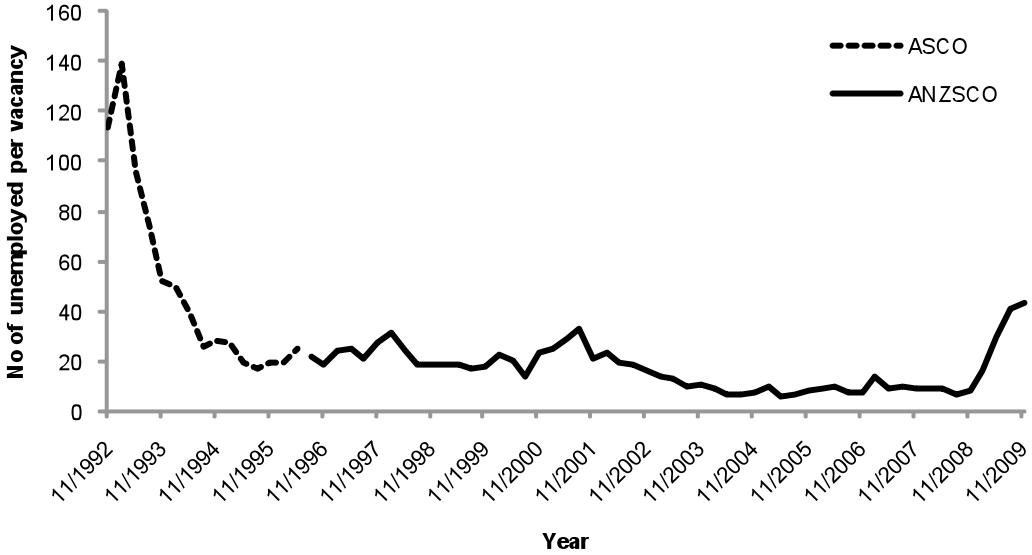
To sort out the different effects of supply and demand across trade groups, we combine the data from the vacancy reports from the Department of Education, Employment and Workplace Relations and the ABS labour force data for unemployment to calculate the number of unemployed people per vacancy for the trades occupations under consideration. This gives us a simple, transparent and readily understood measure of the ratio of excess supply to unmet demand. The raw counts from vacancy reports are used here. This is unlike the Clarius Skills Index referred to in the introduction, which applies a coverage factor to the vacancy numbers. It is therefore likely that our figures understate the demand for skilled labour. However, it should also be noted that, for the various reasons recorded above, ABS figures also understate the true level of occupational unemployment. We have indicated a break in the series where the employment and unemployment figures move from ASCO to the ANZSCO[1] classifications, although we have attempted to keep the occupational categories relatively consistent.[2]

The results, shown in figures 11–15, give a clearer picture of how the ratio of labour supply to labour demand in these trades occupations changes over the economic cycle. For all the trades except the food trades and hairdressing, the number of unemployed workers to vacancies exceeded 100 at the peak of the 1992 recession (noting that the peak occurred later for the food trades, at the end of 1993). For most of the 2000s, there were fewer than 20 unemployed workers for each vacancy in the automotive and engineering trades, electrical trades, the food trades and hairdressing. The numbers of unemployed workers per vacancy in the construction trades were more volatile, exceeding 200 in the 1992 recession and peaking again above 50 in the 2000 downturn. Although the ratio of labour supply to labour demand decreased for all trades from 2000, indicating possible skill shortages, all trades except hairdressing recorded a sharp increase in the ratio following the 2008 downturn. When vacancy and unemployment data are both taken into account, hairdressing is the only trade to have persistently low labour supply to labour demand ratios.

[1] ASCO = Australian Standard Classification of Occupations; ANZSCO = Australian and New Zealand Standard Classification of Occupations.

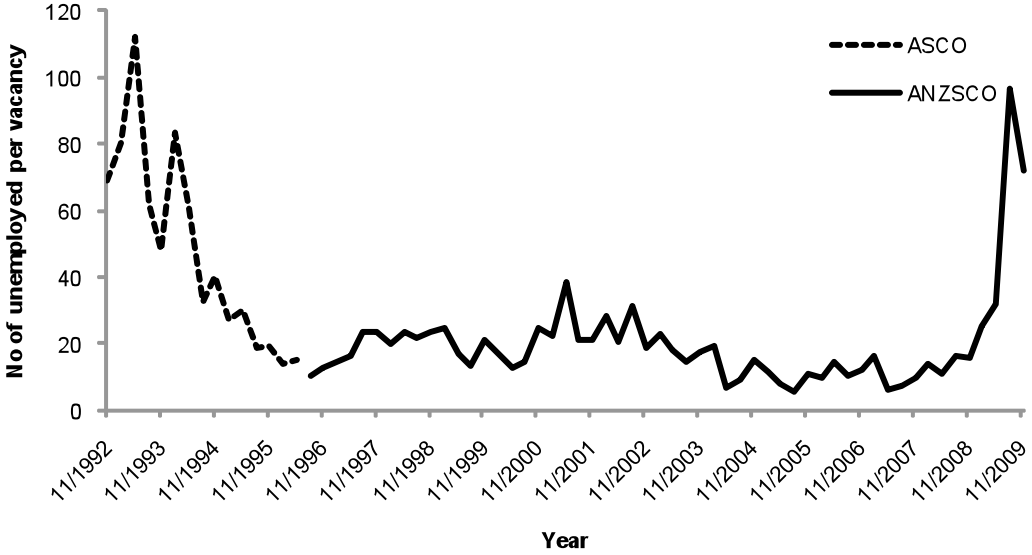
[2] Importantly, for the food trades we include employment and unemployment figures for chefs, which were included in the associate professionals category under ASCO. Metal fabricators, other metal trades, and vehicle trades, which were separate categories under ASCO, have been combined to approximate the automotive and engineering trades category under ANZSCO.

Figure 11 Number of unemployed per vacancy, automotive and engineering



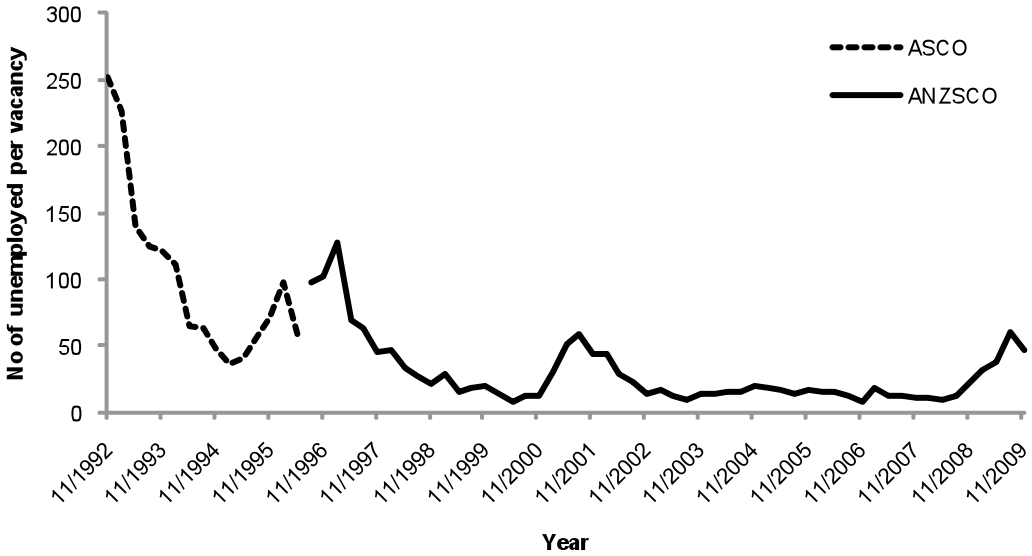
Source: Department of Education, Employment and Workplace Relations Skilled Vacancy Index; ABS Labour Force Quarterly, ABS Labour Force Survey (unpublished data).

Figure 12 Number of unemployed per vacancy, electrical



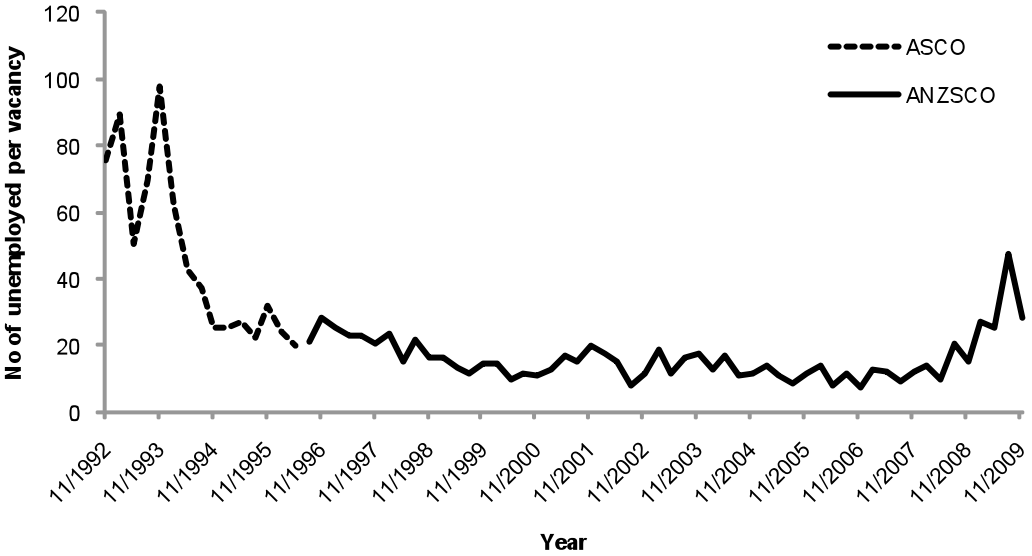
Source: Department of Education, Employment and Workplace Relations Skilled Vacancy Index; ABS Labour Force Quarterly, ABS Labour Force Survey (unpublished data).

Figure 13 Number of unemployed per vacancy, construction



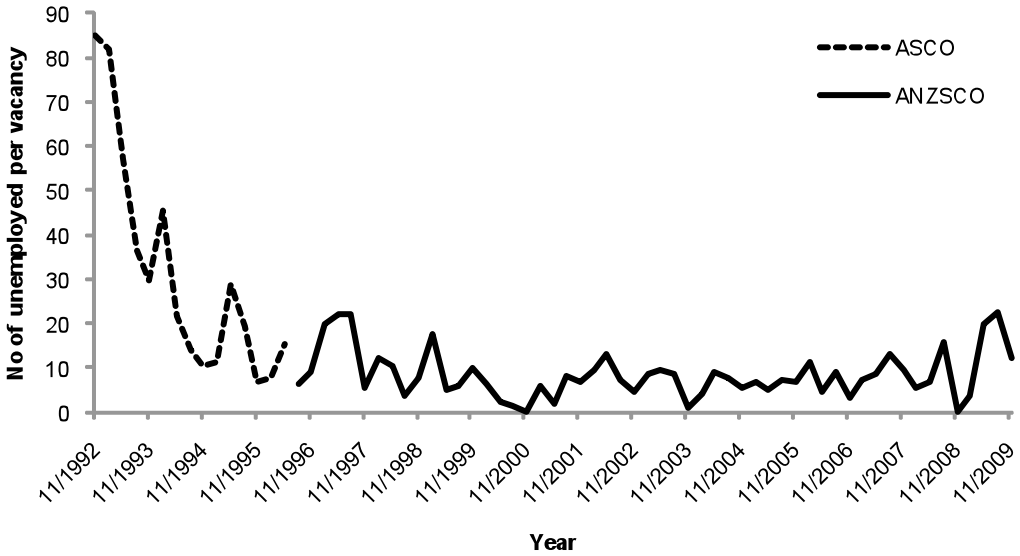
Source: Department of Education, Employment and Workplace Relations Skilled Vacancy Index; ABS Labour Force Quarterly, ABS Labour Force Survey (unpublished data).

Figure 14 Number of unemployed per vacancy, food trades



Source: Department of Education, Employment and Workplace Relations Skilled Vacancy Index; ABS Labour Force Quarterly, ABS Labour Force Survey (unpublished data).

Figure 15 Number of unemployed per vacancy, hairdressing



Source: Department of Education, Employment and Workplace Relations Skilled Vacancy Index; ABS Labour Force Quarterly, ABS Labour Force Survey (unpublished data).

Summary

The combined evidence from employment data, skill shortage research and vacancy data compiled by the Department of Education, Employment and Workplace Relations and ABS unemployment data shows a mixed picture. There is no overwhelming or consistent evidence that persistent skill shortages exist in any of the trades. In the case of the construction trades, there is very little evidence of persistent skill shortages, with sharp declines in employment, and high ratios of labour supply to labour demand. The automotive and engineering trades and the electrotechnology and telecommunication trades experienced a low unemployment-to-vacancy ratio for much of the 2000s, but sharp decreases in employment were recorded in both trades during the 1992 recession. Of the two, the evidence of persistent shortages is stronger for the electrotechnology and telecommunications trades, which recorded lower unemployment levels throughout most of the period. Persistent shortages in the food trades and hairdressing are indicated mainly by low declines in employment during downturns (or in the case of hairdressing, employment growth) and high vacancy-to-employment ratios, but in the case of the food trades this is offset by high occupational unemployment rates.

Labour supply and mobility across the economic cycle

Having identified some limited evidence that skill shortages may be present in the electrotechnology and telecommunications trades, the food trades, and hairdressing, we now turn to factors that may clarify whether this evidence points to real or perceived skill shortages. We examine first how apprenticeship completions correspond with total employment in the trades over the economic cycle. This will indicate whether there is any deficiency in the training system that could account for a persistent shortfall in the supply of skilled labour. Next we focus on labour mobility, concentrating on occupational attrition and job churn and on the characteristics that drive labour mobility in the trades.

In the introduction, we identified two situations where firms may consistently find it difficult to meet their demand for skilled labour over the economic cycle. In the first situation, there is a permanent structural barrier preventing equilibrium from occurring. Either the training system is unable to supply the number of completed apprenticeships to replenish the current stocks of workers, or already-trained workers are unwilling to work at the price offered by employers (Shah & Burke 2002, p.13). Any problems with the number of trained apprentices being supplied can be quickly ascertained by comparing the ratio of apprentice completions to current employment over time. If on the other hand there is an adequate supply of workers but they are unwilling to accept the going price for skilled labour, we should see workers exiting these trades for other occupations, especially those that pay higher wages or offer superior working conditions, or leaving the labour market if the wages on offer are comparable with welfare benefits. This amounts to a structural skills shortage.

In the second situation, the market can reach equilibrium, but low transaction costs mean the equilibrium point constantly adjusts, implying there is a high substitutability of labour. Where labour substitutability is high, small variations in the price of labour—taking into account wages, hours, job security and other less tangible employment conditions, such as the friendliness of the workplace—are enough to induce workers to change firms. There is little reward for remaining with the one employer, since there is no incentive for the firm to pay long-serving employees higher wages than recent entrants with the same general skills. Low transaction costs for employers and employees generate high job churn. At any point in time, there is a large pool of available labour, since workers already in the industry are willing to switch firms. The high turnover feeds the perception of persistent shortages, even though there is a sufficient supply of labour to meet demand.

We suspect that high labour substitutability arises where demand for job-specific skills is low. Workers and apprentices who have acquired job-specific skills have an incentive to remain with the current employer, as other employers are less likely to place the same value on their skills. Likewise, employers dependent on job-specific skills have an incentive to retain their existing labour, since any labour hired from outside the firm will require training, generating additional transaction costs. The level of skill specificity should be linked to labour substitutability and in turn to job mobility. Job-specific skills unique to the firm are required where the work is technology-intensive and/or where there is distinctive product segmentation (Finegold & Wagner 1999). Engineering and automotive and electrotechnology are the two most technology-intensive trades groups. Especially in customised 'value-added' industries, this work also involves specialised products. Customisation limits the scope of automation and increases the demand for a 'highly skilled, more flexible

workforce' (Finegold & Wagner 1999, p.138). Likewise, the unique electrical systems that service complex networks, such as in power generation and transport, require specialised knowledge and skills that are not easily replaced (Wise, Oliver & Buchanan 2008). In contrast, the other trades, including food trades and hairdressing, are less technology-intensive and involve less product market segmentation. There may be some demand for firm-specific skills in the food trades—a Japanese restaurant, for example, may require techniques not commonly used in other types of cuisine—but these would be the exception rather than the rule. We therefore expect to find evidence that it is the lack of firm-specific skills rather than low wages or poor employment conditions that generate the perception of persistent shortages in food trades and hairdressing.

Apprenticeship completions

An obvious explanation for skill shortages is a shortage of qualified workers entering an occupation. Apprenticeships are the principal setting for training in the trades, so a careful consideration of the number of apprentices completing their training is warranted. Karmel and Mlotkowski (2008) examined apprenticeship numbers in the trades over the period 1967–2006. They found that apprenticeship numbers in the metal and vehicle, electrical, and building trades are particularly sensitive to labour market conditions, responding to changes in employment and unemployment. The number of food apprentices by contrast experienced steady growth with only minor corrections. This pattern has continued in the most recent downturn. In the 12 months to 30 June 2009, commencements in the engineering and automotive, electrical and building trades declined by over 20% on the previous year, whereas declines in the food trades and hairdressing were much lower: 7.4% and 10.8% respectively (NCVER 2010a).

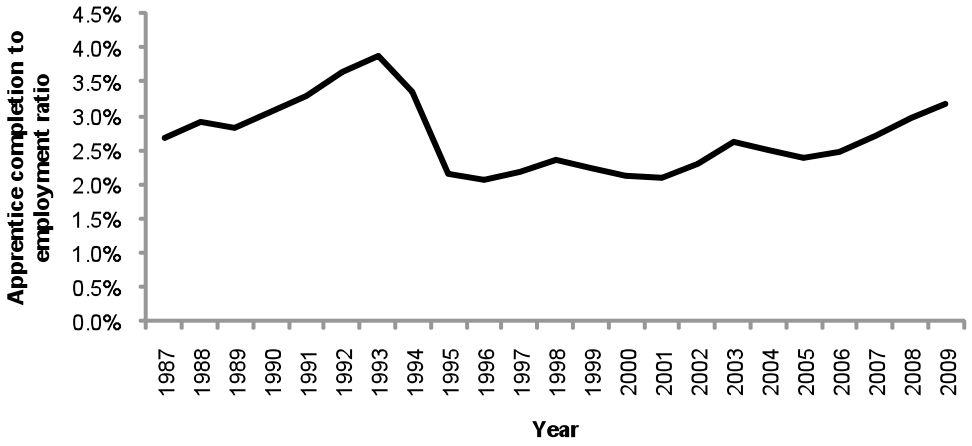
In this section, we show how changes in apprenticeship completions correspond to changes in employment in each of the trades areas.[3] We calculate a gross replenishment ratio. This is the total number employed in the trade (less the number of apprentices in training, since apprentices are included in the total employment numbers for the trades), divided by the number of apprentice completions in that year. For all trades, the gross replenishment ratio varies across the economic cycle, peaking in the downturns when total employment declines. The replenishment ratio for the electrical trades is particularly sensitive to the economic cycle, whereas the food trades and hairdressing ratios experience less variation. Following the 1992 recession and the privatisation of government-owned power companies (Toner 2003), the gross replenishment ratio for electrical trades collapsed, falling from 3.7% in 1994 to 1.8% in 1996. The gross replenishment ratio for electricians recovered much more slowly than for the engineering and automotive and construction trades. It was only in 2008 that the replenishment ratio returned to pre-1992 recession levels. Thus persistent shortages in the electrical trades, to the extent they exist, can be explained by an inadequate supply of skilled labour through the apprenticeship system. The improvement in the replenishment ratio for electricians during the last three years should prevent or reduce the extent of persistent shortages in the near future, however, since it is based on a consistent and sizeable increase in the number of completions, and not a decline in total employment numbers. Indeed, the number of unemployed electricians per vacancy jumped sharply during the 2008 downturn, providing evidence against a shortage.

In contrast, the replenishment ratio for food trades is higher, averaging 2.9% over the period, and more stable over the economic cycle, ranging from 2.3% in 1995 to 3.4% in 2004. The ratios for hairdressing were higher still, averaging 7.3% and ranging from 5.0% in 2002 to 11.1% in 1991. Over the period 1986–2009 the ratio for all trades ranged from 2.1% in 1996 to 3.9% in 1993, averaging 2.7%. To the extent that there may have been persistent skill shortages in the food trades

[3] The employment data are from ABS Labour Force survey. Data on apprenticeship completions are taken from the NCVER *Historical time series of apprenticeships and traineeships in Australia* (NCVER 2010b). Data for hairdressing completions are taken from the publication *Apprenticeship statistics, 1984–1985 to 1993–1994* (NCVER 1995) and the NCVER Apprenticeship and Trainee Collection.

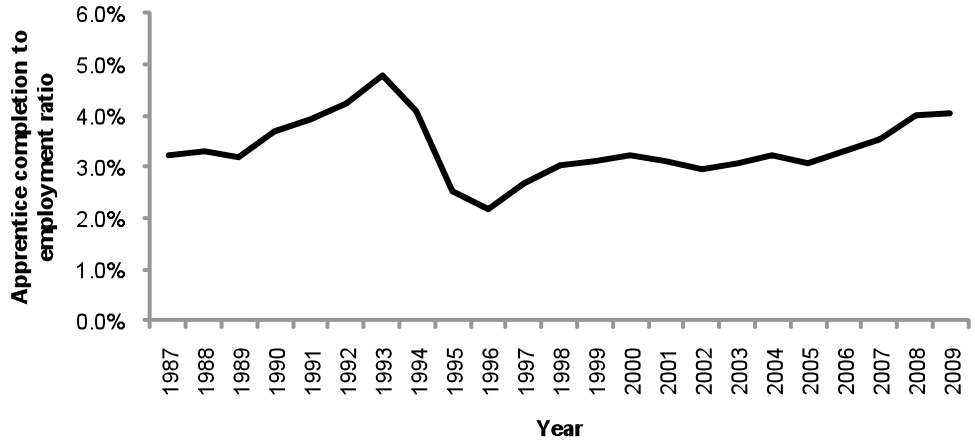
and hairdressing, they cannot be accounted for by deficiencies in the apprenticeship system, since the replenishment ratio for these trades is consistently much higher than the average for all trades. Instead, any explanation for apparent skill shortages in the food trades and hairdressing must lie in the pool of existing tradespeople.

Figure 16 Ratio of apprenticeship completions to total employment, all trades, 1987–2009



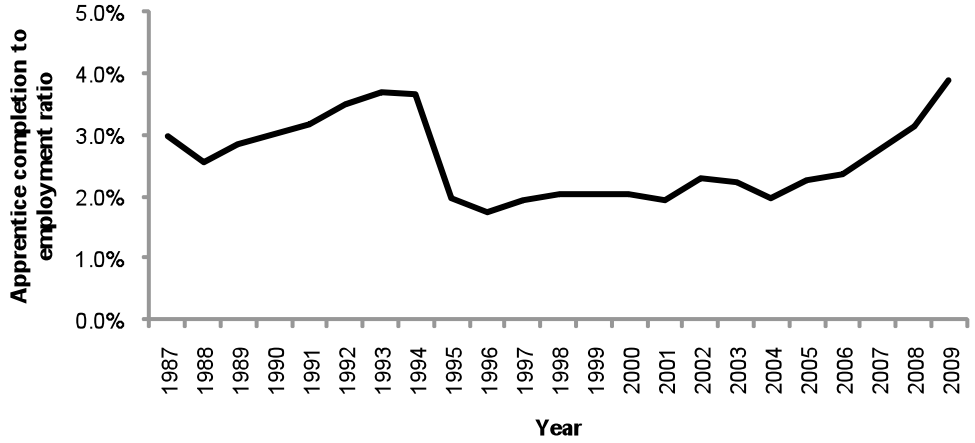
Source: ABS (2010b); NCVER (2010b).

Figure 17 Ratio of apprenticeship completions to total employment, engineering and automotive trades, 1987–2009



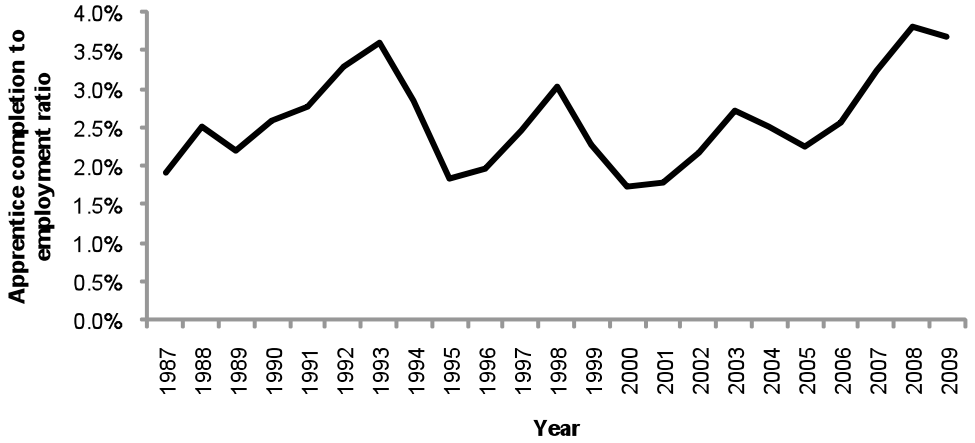
Source: ABS (2010b); NCVER (2010b).

Figure 18 Ratio of apprenticeship completions to total employment, electrical trades, 1987–2009



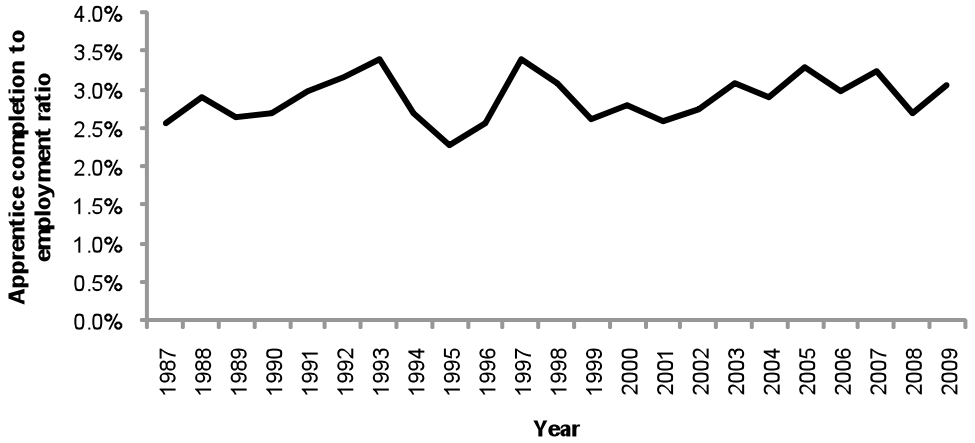
Source: ABS (2010b); NCVER (2010b).

Figure 19 Ratio of apprenticeship completions to total employment, construction trades, 1987–2009



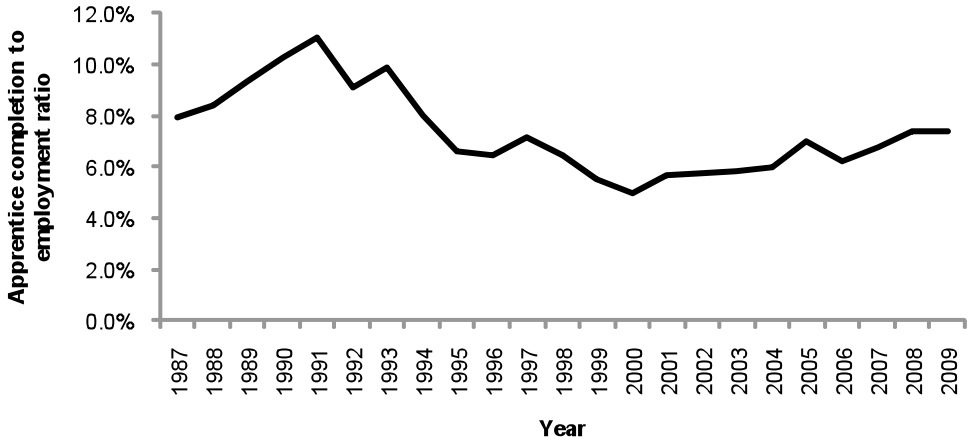
Source: ABS (2010b); NCVER (2010b).

Figure 20 Ratio of apprenticeship completions to total employment, food trades, 1987–2009



Source: ABS (2010b); NCVER (2010b).

Figure 21 Ratio of apprenticeship completions to total employment, hairdressing, 1987–2009



Source: ABS (2010b); NCVER (2010b); unpublished NCVER data.

Job mobility in the trades

Fresh stocks of skilled labour are not the only consideration when examining the supply of skilled labour. Firms may still experience difficulty meeting their demand for labour if there are insufficient people willing to replace existing workers leaving the firm. This does not meet every definition of a skill shortage, but recruitment difficulties do feed perceptions of skills shortage. Workers leaving the firm may be:

- ✧ leaving to start a new job in the same occupation (intra-occupational job mobility, or job churn)
- ✧ leaving to start a new job in a different occupation (occupational mobility)
- ✧ entering unemployment
- ✧ leaving the labour market to retire, for family reasons, because of ill health or for other personal reasons.

We have already identified high vacancy-to-employment ratios in the food trades and hairdressing. These may point to an explanation of skill shortages in these trades, or may just indicate that there is high job turnover in these trades. If poor wages and employment conditions lead to persistent skill shortages in the food trades and hairdressing, we would expect to find high rates of occupational mobility or a sizeable proportion of workers becoming unemployed or leaving the labour market altogether, since alternative employment or income support would be preferable. Alternatively, a high rate of job churn would support the proposition that high labour substitutability contributes to the perception of persistent skill shortages, even though a sufficient supply of labour is available.

Data from the most recent Labour Mobility Survey support the second proposition of consistently high job churn, rather than persistent shortages in relation to the food trades and hairdressers. Table 3 shows that in the 12 months prior to February 2008, male employees in the food trades were much more likely than employees in other trades to leave a job, but most moved to another job in the food trades. In other words, job churn among males in the food trades is higher than the average for all trades, but occupational attrition is lower (as found by Karmel, Lim & Misko forthcoming). Data from the 1994 Labour Mobility Survey show a similar pattern. Even in a weak labour market, more than one in five male employees working in the food trades chose to move jobs, with most of those moving to other jobs in the food trades.

This pattern is much less pronounced among females, mainly because of the higher numbers of females exiting the labour force. Table 4 shows that females leaving jobs in the food trades in 2007–08 were more likely to move to a new occupation, unemployment or out of the labour

market, just as they were in 1993–94. Job churn accounted for less than a quarter of females leaving food trades jobs. In hairdressing, a higher proportion of workers than in the food trades remained in the same job and a lower proportion exited the labour force. A majority of hairdressers leaving their job stayed within the trade during 2007–08 and 1993–94, again demonstrating that occupational attrition is not a particular problem in this trade, even though job churn is high when compared with the average for all trades. What the data from the Labour Mobility Survey show is that females leaving the labour market are more likely to come from the food trades (which employed 39 000 female employees in November 2009) than hairdressing (which employed 47 000 female employees in November 2009) (ABS 2010b).

Table 3 Percentage of workers leaving a trade, 1994 and 2008, males

Occupation	Weak economy (1994)	Strong economy (2008)
All trades (no technicians)		
Job stayers	78.2	78.1
Moving to same occupation or losing and going to same occupation	9.2	10.1
Losing for different occupation, unemployment or out of the labour force	8.4	4.5
Moving to different occupation, unemployment or out of the labour force	4.2	7.3
Engineering and automotive		
Job stayers	80.8	79.6
Moving to same occupation or losing and going to same occupation	8.2	9.9
Losing for different occupation, unemployment or out of the labour force	7.4	4.1
Moving to different occupation, unemployment or out of the labour force	3.6	6.5
Construction		
Job stayers	69.7	77.1
Moving to same occupation or losing and going to same occupation	12.6	11.3
Losing for different occupation, unemployment or out of the labour force	13.6	4.5
Moving to different occupation, unemployment or out of the labour force	4.1	7.1
Electrical		
Job stayers	85.8	79.4
Moving to same occupation or losing and going to same occupation	6.5	9.0
Losing for different occupation, unemployment or out of the labour force	4.3	4.6
Moving to different occupation, unemployment or out of the labour force	3.4	7.0
Food		
Job stayers	66.3	69.1
Moving to same occupation or losing and going to same occupation	17.5	16.9
Losing for different occupation, unemployment or out of the labour force	9.2	2.9
Moving to different occupation, unemployment or out of the labour force	7.1	11.1

Note: Because of differences between the ANZSCO classification used in 2008 and the ASCO classification used in 1994, we exclude technicians from the 2008 analysis and exclude categories that cannot be easily matched between 1994 and 2008.

Source: Generated from ABS (1994, 2008), Confidentialised Unit Record File.

Table 4 Percentage of workers leaving a trade, 1994 and 2008, females

Occupation	Weak economy (1994)	Strong economy (2008)
All trades		
Job stayers	67.9	74.5
Moving to same occupation or losing and going to same occupation	12.1	7.5
Losing for different occupation, unemployment or out of the labour force	8.8	5.4
Moving to different occupation, unemployment or out of the labour force	11.2	12.6
Moving job or losing job and leaving the labour force		*7.8*
Food		
Job stayers	60.4	66.9
Moving to same occupation or losing and going to same occupation	13.7	7.4
Losing for different occupation, unemployment or out of the labour force	9.9	7.2
Moving to different occupation, unemployment or out of the labour force	16.1	18.5
Moving job or losing job and leaving the labour force	*11.4*	*12.4*
Hairdressers		
Job stayers	71.5	76.7
Moving to same occupation or losing and going to same occupation	15.3	14.2
Losing for different occupation, unemployment or out of the labour force	6.1	3.0**
Moving to different occupation, unemployment or out of the labour force	7.1	6.0
Moving job or losing job and leaving the labour force	*6.1*	*4.6*

Notes: Because of differences between the ANZSCO classification used in 2008 and the ASCO classification used in 1994, we exclude technicians from the 2008 analysis and exclude categories that cannot be easily matched between 1994 and 2008.
** indicates based on fewer than 5 respondents.

Source: Generated from ABS (1994, 2008), Confidentialised Unit Record File.

Analysing job mobility in this way does not give a complete picture. For example, it does not take into account job duration. Karmel, Lim and Misko (forthcoming) found that the trades do not have particularly high rates of gross attrition by comparison with the professions. After an initial peak of trades workers leaving the occupation shortly after completing apprenticeships, occupational attrition stabilises. Where the trades differ from the professions is that people continue to enter the professions as they age, replenishing the stocks of workers leaving professions, whereas the supply of trades workers is much more front-loaded. A surprising finding was that gross attrition in the food trades was actually relatively low, alongside electrotechnology and telecommunications, and construction.

We have replicated the analysis to calculate the job-retention and occupation-retention rates for males working in all trades and technical occupations and for females working in food trades, hairdressing and all other female trades workers. The model details are shown in appendix A and a full description of the methodology is contained in Karmel, Lim and Misko (forthcoming). The results for males are summarised in table 5 and show that around two-thirds of male food trades workers remain in the occupation after five years but most of them will have changed jobs at least once. Fewer than one in three (28.5%) male food trades workers who commence at age 20 will remain in the same job for at least five years. The female food trades job-retention rates, summarised in table 6, are lower, with approximately 10% of 35-year-old food trades workers remaining in the same job after 15 years and very high rates of exit from the occupation. The job-retention rate for hairdressers after 15 years is similar to male food trades workers and lower than automotive and engineering trades workers, construction trades workers and electrotechnology and telecommunications trades workers. On the other hand, the occupation-retention rate for hairdressers was actually quite strong. One-quarter of all hairdressers are estimated to remain in the

occupation after 15 years. This was as high as the retention rate for many male trades.[4] This is surprising, given that we would expect to see women moving in and out of the labour force in line with family circumstances. The low rates of occupational attrition for hairdressing and the food trades, taking males and females together, are further confirmation that there is not an issue with supply in these trades and that what we are observing are perceived skill shortages.

Table 5 Percentage of a cohort remaining in a job and occupation by period since entry, for trades only, 2008, males

Occupation	Job retention			Occupational retention		
	Age 20	Age 25	Age 35	Age 20	Age 25	Age 35
Engineering, ICT and science technicians	100	29.7	9.9	100	27.3	6.6
Automotive and engineering trades workers	100	37.6	20.7	100	58.5	24.2
Construction trades workers	100	40.3	24.5	100	66.4	34.9
Electrotechnology and telecommunications trades workers	100	41.2	23.1	100	55.2	20.1
Food trades workers	100	28.5	14.3	100	52.5	19.6
Skilled animal and horticultural workers	100	47.4	19.7	100	49.3	13.6
Other technicians and trades	100	40.8	15.0	100	55.0	18.0

Notes: Both models assume tradesperson enters job and occupation at age 20. Since models have different specifications, it is possible for job retention to exceed occupational retention in any given year.

Source: Generated from ABS (2008), Confidentialised Unit Record File.

Table 6 Percentage of a cohort remaining in a job and occupation by period since entry, for trades only, 2008, females

Occupation	Job retention			Occupational retention		
	Age 20	Age 25	Age 35	Age 20	Age 25	Age 35
Engineering, ICT & science technicians	100	33.3	14.1	100	45.7	11.5
Food trades workers	100	26.2	10.7	100	25.0	1.1
Hairdressers	100	42.3	15.5	100	68.8	27.6
All other female trades and technical workers	100	25.9	11.3	100	28.7	4.4

Notes: Both models assume tradesperson enters job and occupation at age 20. Since models have different specifications, it is possible for job retention to exceed occupational retention in any given year.

Source: Generated from ABS (2008), Confidentialised Unit Record File.

Job mobility and change in employment conditions

If job mobility is a large part of the explanation for apparent skill shortages in the food trades and hairdressing, then the next question is what prompts employees to change jobs and occupations. Karmel, Lim and Misko (forthcoming) found that male employees who leave the food trades, which is among the lowest-paid trades, move to jobs in occupations that on average pay more. This is so, even though they predominantly move to jobs with a lower skill requirement. However, while low wages may explain why some people leave jobs in the food trades for other occupations, we cannot conclude that wages explain high job churn, since most food trades and hairdressing workers changing jobs remain within the same occupation. We would expect that wages in the occupation would increase over time to a new equilibrium, causing job mobility to reduce. In any

[4] For a given occupation, the number of workers remaining in the occupation may appear less than the number of workers remaining in a job after a given period. This is because different models were used to predict occupational and job retention. Smaller occupations in particular are subject to high standard errors.

case, the Labour Mobility Survey does not include information on earnings. We also know that a comparatively high proportion of food trades workers and hairdressers are reliant on minimum wages, so there is not a great degree of wage differentiation within these occupations. One in three food trades workers (32.9%) and nearly two in three hairdressers (63.3%) are reliant on minimum wages, compared with fewer than one in five technicians and trades workers (18.7%) (Bolton & Wheatley 2010, table 4).

Apart from pay, there are many employment-based reasons for changing jobs, some tangible, others intangible. In the remainder of this report, we focus on a few measurable conditions: working hours and employment security. There is little evidence to suggest that long working hours contribute to perceived shortages in the food trades or hairdressing. We use the data from the 2008 Labour Mobility Survey, as the 1994 survey does not include hours worked. As shown in table 7, males leaving food trades jobs work longer hours on average in their subsequent job, whereas for all male trades employees, job changes usually result in a reduction in working hours. Similarly, table 8 shows that female workers changing jobs from the food trades and other trades work fewer hours in their subsequent job, but the reduction in hours is less than the average for all female trades employees. A more complete picture of changes in job hours must take into account whether workers are job movers or job losers. A reduction in work hours may represent an active choice for a job mover. On the other hand, a reduction in working hours for job losers who move jobs is more likely to be involuntary. Overall, the pattern is consistent across males and females. Those moving from the food trades to other occupations do work fewer hours, but the majority of workers leaving jobs choose to stay in the occupation and on average work more hours, not fewer. There is therefore little evidence that workers leave jobs in the food trades and hairdressing to escape long hours.

Table 7 Change in working hours, by occupational destination by trade, males 2008

Trade	Initial job		Subsequent job
.	Average total weekly hours	Average total weekly change	Average ending hours
All technical and trades workers			
All	41.7	-0.6	41.1
Job losers	42.2	-1.8	40.4
Job movers	41.5	-0.2	41.3
Same occupation	42.8	-0.9	41.9
Different occupation	39.9	-0.1	39.8
Food trades workers			
All	43.0	0.2	43.2
Job losers	36.2	0.3	36.5
Job movers	44.1	0.2	44.3
Same occupation	45.0	-1.1	43.9
Different occupation	37.5	3.7	41.2

Source: Generated from ABS (2008), Survey of Labour Mobility, Confidentialised Unit Record File.

Table 8 Change in working hours, by occupational destination by trade, females, 2008

Trade	Initial job		Subsequent job
.	Average total weekly hours	Average total weekly change	Average ending hours
All technical and trades workers			
All	35.7	-1.6	34.2
Job losers	37.6	-4.3	33.4
Job movers	35.1	-0.7	34.4
Same occupation	36.5	-0.1	36.4
Different occupation	35.0	-3.0	31.9
Food trades workers			
All	30.9	-1.2	29.8
Job losers	38.0**	-9.2**	28.9**
Job movers	29.5	0.5	29.9
Same occupation	32.4	1.0	33.3
Different occupation	29.9	-2.6	27.3
Hairdressers			
All	36.1	-1.1	35.0
Job losers	35.0	-2.0	33.0
Job movers	36.7	-0.6	36.2
Same occupation	35.3	1.5	36.9
Different occupation	39.7**	-13.8**	25.9**

Note: ** Based on fewer than 5 respondents.
Source: Generated from ABS (2008), Confidentialised Unit Record File (CURF).

While data from the survey can tell us if employees are moving to jobs with more or fewer hours, they do not address when those hours are worked. Shiftwork is especially common in hospitality. Employees working shiftwork might be tempted to move jobs to avoid a conflict caused by working hours. In the hospitality industry in particular, split shifts may generate work–life conflict and prompt higher job turnover (Ryan 2006).

An alternative motivation for changing jobs may be to attain greater employment security. This could be a particular factor in the food trades, as the hospitality industry has one of the highest rates of casual employment (ABS 2010c). We therefore examined whether workers changing jobs were predominantly moving from casual employment to ongoing employment. However, we found that this was not the case for male employees. Nearly twice as many workers in the food trades leave ongoing jobs for casual jobs as leave casual jobs for ongoing jobs (see table 9). Fewer male employees in the food trades leave employment to become self-employed, compared with construction and electrotechnology and telecommunications.

Table 9 Changes to employment status, employees changing jobs, 2008, males and females (%)

Trade	Employee to employee			Employee to self-employed
	No change in status	Casual to permanent[1]	Permanent to casual[2]	
Males				
All trades	61.0	12.6	16.2	10.2
Automotive & engineering	57.0	16.0	19.5	7.6
Construction	50.1	11.9	23.1	15.0
Electrotechnology & telecommunications	63.5	11.8	10.6	14.1
Food	68.4	8.7	16.1	6.9**
Females				
All trades	61.4	19.9	12.2	6.5**

Notes: 1 From no paid leave entitlements to paid leave entitlements.
2 From paid leave entitlements to no paid leave entitlements.
Engineering, ICT and science technicians, skilled animal & horticultural and other technicians and trades workers are not displayed because of insufficient responses in multiple categories.
** Based on fewer than 5 respondents

Source: Generated from ABS (2008), Confidentialised Unit Record File.

The pattern for females leaving trades jobs may be marginally different, but most female employees leaving trades jobs move to a job with the same employment status. Female trades workers appear more likely to move from casual to permanent jobs than from permanent to casual jobs. One in five moves from casual to permanent and one in eight moves from permanent to casual. A very small proportion leaves employment to become self-employed. The small number of responses means that it is not possible to report this by each trade. Employment status cannot therefore account for high job churn in the food trades and hairdressing.

Skill substitutability

We now return to our hypothesis that high turnover in the trades, noticeably in the food trades and hairdressing, is associated with high labour substitutability and low demand for job-specific skills. As a proxy for job-specific skills, we use level of education. It is widely assumed that to work in a trade usually requires at least a VET-level qualification. For example, ANZSCO allocates technicians and trades workers to either skill level 2 or skill level 3. Skill level 2 assumes an Australian Qualifications Framework (AQF) associate degree, advanced diploma or diploma, or at least three years of experience. The notional qualification requirements for skill level 3 occupations are an AQF certificate III, including at least two years of on-the-job training or an AQF certificate IV or at least three years of relevant experience. However, in practice there is a relatively loose connection between occupations and VET qualification in the Australian labour market (Karmel, Mlotkowski & Awodeyi 2008).

When we examine job mobility patterns by level of highest qualification, we find that those working in technical and trades job without a post-school qualification are more likely to change jobs and more likely to move to another occupation than those with a VET-level qualification. (The small proportion of university-qualified employees working in technical and trades occupations were most likely to move to a different occupation, presumably into professional occupations.) This relationship is true for both males and females, but is stronger for males (see table 10). Although the data cannot be reported because of small cell sizes, the relationship is also consistent for each trade grouping. Based on this finding, we can conclude that job churn and occupational attrition have more to do with skill attainment than non-wage employment conditions such as hours and job security.

Table 10 Job mobility by level of education, employees working in trades and technical occupations

Level of education	Job stayers	Move to same occupation	Move to different occupation, unemployed, NILF
Male			
University	77.2	4.1	18.7
VET	79.4	11.7	8.9
No post-school qualification	77.6	6.4	16.0
Total	**78.7**	**9.4**	**11.9**
Female			
University	74.7	5.9	19.4
VET	76.2	9.2	14.7
No post-school qualification	75.7	5.7	18.6
Total	**75.8**	**7.3**	**16.9**

Note: NILF = not in labour force.
Source: Generated from ABS (2008), Confidentialised Unit Record File.

Individuals who have made the greatest investment in acquiring job-specific skills are more likely to remain in the occupation, presumably since they are less likely to achieve a premium for their qualification in another occupation. The relationship is not so distinct for females, primarily because females are more likely than males to leave the labour force rather than move to another occupation.

And as table 11 demonstrates, workers in the food trades are among the least likely to have a VET-level qualification. Among males, food trades workers are more likely than those in engineering and automotive and electrical trades to have no post-school qualification. However, a higher proportion of workers in the construction and animal and horticultural trades had no post-school qualification. Only a third of female food trades workers had VET-level qualifications, but almost two-thirds of female hairdressers had qualifications. Thus, lower qualification levels can explain higher levels of job churn and occupational attrition in the food trades. What is missing is an explanation of high job churn in hairdressing. Most hairdressers have VET-level qualifications but, unlike the electrotechnology trades, the apprenticeship system has consistently provided a sufficient supply of newly skilled labour. It may still be the case that hairdressing requires fewer firm-specific skills than other trades such as automotive and engineering and electrical, but we cannot conclude this on the basis of the proportion of hairdressers with VET qualifications. In the absence of an explanation based on skill, we are left with workplace culture and other unobserved workplace conditions as the motivation for high job churn in this trade.

Table 11 Level of education by occupation and sex, 2008

	University	VET	No post-school qual.
Males			
All technical and trades occupations	5.8	60.0	34.3
Engineering, ICT & science technicians	22.6	55.2	22.3
Engineering & automotive trades workers	2.4	66.9	30.7
Construction trades workers	1.5	54.7	43.9
Electrotechnology trades workers	5.5	62.6	32.0
Food trades workers	2.7	59.6	37.7
Skilled animal & horticultural workers	3.1**	50.1	46.8
Other trades and technical workers	4.5	58.4	37.1
Females			
All technical and trades occupations	11.4	46.1	42.6
Engineering, ICT & science technicians	27.5	43.0	29.5
Food trades workers	6.6	36.6	56.8
Hairdressers	1.1**	65.6	33.3
All other trades & technicians	9.6	42.8	47.6

Note: ** Based on fewer than 5 respondents.

Source: Generated from ABS (2008), Confidentialised Unit Record File.

Final comments

In this report, we have considered the empirical and theoretical evidence in support of skill shortages in the trades during economic downturns. According to the Department of Education, Employment and Workplace Relations and other reports, some trade occupations continued to experience skill shortages during the recent downturn but they were much less widespread than before the downturn began. For a more complete picture, we examined the supply and demand for labour in the trades across the last 20 years. We did not identify any trades grouping that has experienced skill shortages during every downturn of the last 20 years, but there are three trades groups where there is limited and unconvincing evidence of skill shortages during economic downturns. These were the electrical trades, the food trades and hairdressing. Persistent skill shortages in the electrical trades are associated with the decline in apprenticeship completions following the 1992 recession. A recent recovery in the rate of apprenticeship completions greatly reduces the likelihood of skill shortages persisting in the electrical trades.

Table 12 Summary of evidence of skill shortages during economic downturns

	Automotive & engineering	Construction	Electro-technology	Food	Hairdressing
Indicators					
Positive employment growth	No	No	No	Part	Yes
Persistent DEEWR skill shortage	Part	No	Part	Part	Part
High vacancy rates	No	No	No	Yes	Yes
Low unemployment rates	No	No	Yes	No	Yes
Low unemployment-to-vacancy ratio	No	No	Yes	No	Yes
Explanations					
Low apprentice completions-to-employment ratio			Yes	No	No
High job mobility	.		No	Yes	Yes

Our analysis suggests that the perception of persistent shortages in the food trades and hairdressing is associated with job churn rather than with any permanent structural imbalance. That is, these occupations experience higher frictional unemployment than others and this is because people change jobs frequently within the industry.

It is difficult to see any broad policy response. Although employees cite working conditions as the reason for switching jobs, it is not a question of wages or other tangible employment conditions, such as hours or employment status. This leaves workplace culture and other intangible factors. Since people don't move jobs for more money, it is unlikely that a general wage increase would change the situation. A general wage increase would also fail to solve high job churn, because workers would still find it easy to switch employers, even if wages were higher. We have speculated that this is because of higher labour substitutability in the food trades. This implies that firms that develop and reward job-specific skills will experience less job churn, but not all firms will wish to pursue such a strategy. Otherwise, individual firms in the food trades and in hairdressing could attempt to increase retention among existing workers and increase their attractiveness in the labour market by addressing workplace culture and other intangible employment conditions.

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Appendix A

Table A1 presents the regression coefficients of the regression model used to determine job staying for males. In undertaking this regression, job staying, age and duration were derived from the 2008 ABS Labour Mobility Survey. Table A2 presents the standard errors of the regression coefficients. Tables A3 and A4 repeat this for females.

Table A1 Model parameters for logistic regression (1 = stay in job during next 12 months), males

	N	Intercept	ageqf	ageqf2	dur	dur2
Engineering, ICT and science technicians	469	-1.440	0.144	-0.00169	0.01121	-0.00004
Automotive and engineering trades workers	1012	0.309	0.018	-0.00021	0.03286	-0.00012
Construction trades workers	978	-0.302	0.070	-0.00093	0.02751	-0.00008
Electrotechnology and telecommunications trades workers	581	1.702	-0.069	0.00119	0.03108	-0.00011
Food trades workers	300	2.219	-0.154	0.00241	0.04673	-0.00018
Skilled animal and horticultural workers	227	2.346	-0.0606	0.00063	0.01790	-0.00006
Other technicians and trades workers	344	1.495	-0.0126	0.00001	0.01328	-0.00003

Source: Derived from 2008 Survey of Labour Mobility, Confidentialised Unit Record File.

Table A2 Standard errors for parameters for logistic regression (1 = stay in job during next 12 months), males

	Intercept	ageqf	ageqf2	dur	dur2
Engineering, ICT and science technicians	0.065	0.003	0.00004	0.00042	0.000002
Automotive and engineering trades workers	0.036	0.002	0.00003	0.00029	0.000001
Construction trades workers	0.038	0.002	0.00003	0.00032	0.000001
Electrotechnology and telecommunications trades workers	0.059	0.004	0.00005	0.00044	0.000002
Food trades workers	0.065	0.004	0.00006	0.00059	0.000003
Skilled animal and horticultural workers	0.092	0.005	0.00006	0.00058	0.000003
Other technicians and trades workers	0.065	0.004	0.00004	0.00445	0.000002

Source: Derived from 2008 Survey of Labour Mobility, Confidentialised Unit Record File.

Table A3 Model parameters for logistic regression (1 = stay in job during next 12 months), females

	N	Intercept	ageqf	ageqf2	dur	dur2
Eng, ICT & science technicians	132	-0.198	0.075	-0.00101	0.01287	-0.00002
Food trades	130	3.169	-0.232	0.00350	0.05509	-0.00023
Hairdressing	158	0.555	0.025	0.00010	0.01786	-0.00008
Other trades and technicians	245	-0.712	0.056	-0.00034	0.02794	-0.00010

Source: Derived from 2008 Survey of Labour Mobility, Confidentialised Unit Record File.

Table A4 Standard errors for parameters for logistic regression (1 = stay in job during next 12 months), females

	Intercept	ageqf	ageqf2	dur	dur2
Eng, ICT & science technicians	0.132	0.008	0.00010	0.00086	0.000004
Food trades	0.117	0.007	0.00010	0.00088	0.000004
Hairdressing	0.102	0.007	0.00010	0.00083	0.000004
Other trades and technicians	0.087	0.005	0.00007	0.00059	0.000003

Source: Derived from 2008 Survey of Labour Mobility, Confidentialised Unit Record File.

Further details relating to the derivation of variables and the construction of the regression model are available in appendix A of Karmel, Lim and Misko (forthcoming).

The following regression was undertaken to determine the probability of leaving an occupation in the next 12 months (from February 2007). Table A5 presents the model parameters and table A6 the standard errors of the parameters. Occupational duration was not available in the Labour Mobility Survey, so only age and age squared were used. Further details relating to the derivation of variables and the construction of the regression model are available in appendix A of Karmel, Lim and Misko (forthcoming)

Table A5 Model parameters for logistic regression (1 = change occupation during next 12 months), males

	N	Intercept	ageqf	ageqf2
Engineering, ICT and science technicians	470	2.52952	-0.2195	0.002418
Automotive and engineering trades workers	1014	-0.65668	-0.09525	0.001255
Construction trades workers	984	-0.65554	-0.11191	0.001443
Electrotechnology and telecommunications trades workers	583	-1.76635	-0.00583	-0.00032
Food trades workers	301	-0.75489	-0.0653	0.000508
Skilled animal and horticultural workers	228	-1.46546	-0.02212	0.000168
Other technicians and trades workers	344	-1.47675	-0.03711	0.000503

Source: Derived from 2008 Survey of Labour Mobility, Confidentialised Unit Record File.

Table A6 Standard error parameters for logistic regression (1 = change occupation during next 12 months), males

	Intercept	ageqf	ageqf2
Engineering, ICT and science technicians	0.066	0.003	0.00004
Automotive and engineering trades workers	0.043	0.002	0.00003
Construction trades workers	0.047	0.003	0.00003
Electrotechnology and telecommunications trades workers	0.069	0.004	0.00006
Food trades workers	0.076	0.004	0.00006
Skilled animal and horticultural workers	0.095	0.005	0.00006
Other technicians and trades workers	0.073	0.004	0.00005

Source: Derived from 2008 Survey of Labour Mobility, Confidentialised Unit Record File.

Table A7 Model parameters for logistic regression (1 = change occupation during next 12 months), females

	N	Intercept	ageqf	ageqf2
Eng, ICT & science technicians	133	-1.472	-0.030	0.00037
Food trades	130	-1.774	0.075	-0.00180
Hairdressing	160	-3.376	0.093	-0.00201
Other trades and technicians	247	-0.637	-0.058	0.00046

Source: Derived from 2008 Survey of Labour Mobility, Confidentialised Unit Record File.

Table A8 Standard error parameters for logistic regression (1 = change occupation during next 12 months), females

	Intercept	ageqf	ageqf2
Eng, ICT & science technicians	0.147	0.008	0.00011
Food trades	0.115	0.006	0.00008
Hairdressing	0.154	0.010	0.00014
Other trades and technicians	0.085	0.005	0.00006

Source: Derived from 2008 Survey of Labour Mobility, Confidentialised Unit Record File.

Appendix B

Table B1 Change in working hours, by occupational destination by trade, males, 2008

Trade	Initial job		Subsequent job
	Average total weekly hours	Average total weekly change	Average ending hours
All technical & trades workers			
All	41.7	-0.6	41.1
Job losers	42.2	-1.8	40.4
Job movers	41.5	-0.2	41.3
Same occupation	42.8	-0.9	41.9
Different occupation	39.9	-0.1	39.8
Engineering, ICT & science technicians			
All	40.7	0.2	40.80
Job losers	41.0	-1.5	39.5
Job movers	40.5	0.6	41.2
Same occupation	39.9	-1.5	38.4
Different occupation	41.2	1.5	42.7
Automotive & engineering trades workers			
All	43.6	-2.0	41.6
Job losers	47.1	-3.5	43.6
Job movers	42.3	-1.5	40.8
Same occupation	46.1	-1.8	44.3
Different occupation	39.1	-2.3	36.8
Construction trades workers			
All	41.2	-0.9	40.3
Job losers	41.1	-2.4	38.7
Job movers	41.2	-0.4	40.7
Same occupation	40.7	-0.8	39.9
Different occupation	42.0	-1.0	41.0
Electrotechnology & telecommunications trades workers			
All	41.2	0.6	41.8
Job losers	39.9	2.1	42.0
Job movers	41.6	0.2	41.8
Same occupation	40.2	2.1	42.3
Different occupation	42.7	-1.5	41.2
Food trades workers			
All	43.0	0.2	43.2
Job losers	36.3	0.3	36.5
Job movers	44.1	0.2	44.3
Same occupation	45.0	-1.1	43.9
Different occupation	37.5	3.7	41.2

Trade	Initial job		Subsequent job
	Average total weekly hours	Average total weekly change	Average ending hours
Skilled animal & horticultural workers			
All	33.6	2.0	35.7
Job losers	34.7**	1.3**	36.0**
Job movers	33.3	2.2	35.6
Same occupation	37.3	0.3	37.7
Different occupation	30.7	3.4	34.1
Other technicians and trades workers			
All	40.1	-0.7	39.4
Job losers	38.6	-3.5	35.2
Job movers	40.6	0.3	41.0
Same occupation	39.8	-2.1	37.7
Different occupation	40.5	1.3	41.9

Note: ** Based on fewer than 5 respondents.

Source: Generated from 2008 Survey of Labour Mobility, Confidentialised Unit Record File.

Table B2 Change in working hours, by occupational destination by trade, females, 2008

Trade	Initial job		Subsequent job
	Average total weekly hours	Average total weekly change	Average ending hours
All technical & trades workers			
All	35.7	-1.5	34.2
Job losers	37.6	-4.3	33.4
Job movers	35.1	-0.7	34.4
Same occupation	36.5	-0.1	36.4
Different occupation	35.0	-3.0	31.9
Engineering, ICT & science technicians			
All	38.2	0.4	38.7
Job losers	40.7**	-10.0**	30.7**
Job movers	37.9	1.9	39.8
Same occupation	40.5	-0.3	40.1
Different occupation	36.1	1.2	37.3
Food trades			
All	30.9	-1.2	29.8
Job losers	38.0**	-9.2**	28.9**
Job movers	29.5	0.5	29.9
Same occupation	32.4	1.0	33.3
Different occupation	29.9	-2.6	27.3
Hairdressing			
All	36.1	-1.1	35.0
Job losers	35.0	-2.0	33.0
Job movers	36.7	-0.6	36.2
Same occupation	35.3	1.5	36.9
Different occupation	39.7**	-13.8**	25.9**
All other technical & trades occupations			
All	38.6	-4.3	34.4
Job losers	39.5**	-1.8**	37.8
Job movers	38.3	-5.3	33.0
Same occupation	39.8	-5.4	34.4
Different occupation	38.0	-3.7	34.4

Note: ** Based on fewer than 5 respondents.

Source: Generated from 2008 Survey of Labour Mobility, Confidentialised Unit Record File.

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