

Reasons why Persons with VET Qualifications are Employed in Lower Skilled Occupations and Industries.

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Executive Summary

In 2003, 336,000 people with diplomas and 550,000 people with Certificate III/IV were employed in jobs that were not commensurate with the skill level implied by their qualifications. The purpose of this report is to provide an assessment of the reasons why.

We have sought to understand this problem by answering the following key questions:

- How has the overall occupational pattern of employment in Australia changed over the past decade and how has this affected people with VET qualifications?
- What occupations utilise VET qualifications/skills and has this changed over time?
- What socio-economic and demographic factors are associated with employment in jobs that do not use people's VET qualifications?
- Which of these factors can be seen to have the most impact on the employment outcomes of people with VET qualifications?

Previous (international and Australian) research suggests the following factors increase the risk of being in a job that is not commensurate with one's skills/qualification:

- Low quality of education/training;
- Relatively low demand for the skill on completion of the course;
- Lower levels of ability, for a given level of education;
- Being younger;
- Having pre-school aged children;
- Working in large firms;
- Being from a Non-English speaking background (at least among recent migrants);
- Having lower geographic mobility.

In a dynamic economy that is subject to structural change, there will never be a precise match between the skills that workers have and the skill requirements of jobs. Furthermore, the skill requirements of a job often extend well beyond the knowledge learned in obtaining a formal qualification. Hence, the term 'skill' should ideally be conceived as encompassing formal qualifications together with other skills derived from on-the-job training, and including cognitive abilities, personal traits, etc. It is also costly for both workers and firms to search for the perfect match between worker capabilities and interests, and firm requirements. These costs include the economic and social costs of moving to where the good job is. Thus workers are willing to accept jobs that do not use all their skills, or which they do not like in other ways, in order to avoid having to continue their search for the best job. And

employers are willing to hire people who do not have the combination of attributes that they really want, for the same reason.

The two main developments in the Australian labour market in the recent past that are likely to have aggravated the problem of under-utilization of VET qualifications are the decline in jobs that are VET-intensive and the rapid growth in the absolute and relative numbers of people with university qualifications. Over the decade to 2003, the proportion of working age people with VET qualifications fell by 4 percentage points while the share with university qualifications rose by 6 percentage points.

It is clear that there has been a strong shift in the pattern of labour demand away from vocational qualifications towards university qualifications. People with vocational qualifications have been facing a labour market with a declining (relative) appetite for their skills and a growing preference for university qualifications. This provides support for the view that structural change in the economy is reducing the number of jobs that require or value VET qualifications. To illustrate this point, between 1986 and 2001, the Tradespersons occupation experienced a 3.7 per cent *decrease in share of employment* and a fall of 13,300 in the *absolute numbers* of people employed in trades jobs. The Tradespersons occupation was the only occupation to experience this decline. Had the rate of trades jobs growth matched the economy-wide average, there would have been an additional 301,200 trades jobs in 2001.

People with trades qualifications stand out as beginning to leave trades jobs in the first period after they qualify, with a continuing outflow at every age from then on. No other major occupation has this pattern. There is something about employment in the trades (at least between 1986 and 2001) that means that people do not want to spend long periods in these jobs, or cannot find continuing employment. The reasons probably include the decline (until recently) in aggregate employment in the trades, relatively low pay and little pay progression with more experience.

We examined the characteristics of people who were employed in jobs below their qualification level. The problem is more pronounced for those with Diplomas as compared with Certificate III/IV with 33 per cent of those with Certificate III/IV working below their skill compared with 44 per cent for those with Diplomas.

In brief, those most likely to be in jobs below their skill level are disproportionately women, working less than 40 hours per week, employed as casuals, migrants from a non-English speaking background, young, qualified in the fields of society and culture, management and commerce, education, health or creative arts and employed in transport, agriculture or retail.

The normal characteristics of a labour market provide part of the explanation as to why some people are employed in jobs that are inferior to their skills/qualifications.

Our analysis has provided some more particular reasons.

First, structural change in the economy has moved employment away from VET dominated occupations (especially the trades), and towards occupations that require higher education (professions, associate professions and managers and

administrators). This will increase the likelihood that VET-qualified workers will have to look for lower level jobs.

Second, the growth in the proportion of the workforce that has higher education (bachelor degree or above), relative to VET qualifications, will intensify the competition for jobs where both types of qualification are found (especially associate professionals and advanced or intermediate clerical and service jobs). This can be explained in part as 'over-education', leading to 'bumping down' of those with VET qualifications. It can also be understood in terms of the impact of computer-based technologies on the qualities that employers need, with a movement away from teachable practical skills towards higher level problem-solving and inter-personal skills.

Third, the increased share of women in paid employment is likely to have reduced the quality of the skill match. The reasons are that women are much less likely than men to be employed fulltime (and especially, to work more than 40 hours per week), and be on a continuing employment contract. Both these features reduce the payoff to long search for a job that has a good match between the worker and the firm. Women are also less likely to be geographically mobile and to be willing to incur long commuting times to find a good job match.

Fourth, the secular shift towards less secure employment and to a division between long and short hours of work (at the expense of the 'normal' 35-40 hours job) will probably reduce the quality of the job match for men as well as for women. Our regression results show that casual workers were more likely than permanent workers to have a job-skill mismatch, as were part-time workers.

Fifth, some industries have a particularly poor record of making use of the skills/qualifications of their workers (for example, Transport and Storage). It may be that when a VET-qualified person cannot find a job that uses their skills, they find one that does not, and the jobs they can get have been particularly in transport and in the fast growing areas of retail and wholesale. We suspect that this is the correct way to interpret the strong links between some industries and high levels of skill mismatch.

Finally, there is suggestive evidence that self-reported health status had a significant effect on the extent to which people felt that they used many of their skills in their job. Specifically, the worse their health, the less they felt that they used their skills in their job.

1. Introduction

1.1. Purpose of the Report

The purpose of this report is to provide an assessment of the reasons why some people with vocational and educational training (VET) qualifications and skills are not working in occupations commensurate with those skills. It is in response to a review by the Independent Pricing and Regulatory Tribunal (IPART) that identified job-skill mismatch as a key issue in NSW. Specifically, the Tribunal is concerned with evidence that shows a significant proportion of VET qualified persons are either working in occupations at lower skills levels or have withdrawn from the labour force.

The scope of our assessment involved providing answers to the following key questions:

- How has the overall occupational pattern of employment in Australia changed over the past decade and how has this affected people with VET qualifications?
- What occupations utilise VET qualifications/skills and has this changed over time?
- What socio-economic and demographic factors are associated with employment in jobs that do not use people's VET qualifications?
- Which of these factors can be seen to have the most impact on the employment outcomes of people with VET qualifications?

This report is organised as follows: Section 2 provides an overview of the literature relevant to the issue of job-skill mismatch; Section 3 examines relevant changes in the structure of industry and jobs; Section 4 presents the results of our detailed analyses; Section 5 provides a discussion of our findings.

2. Literature Review

This section reviews the literature that is relevant to the issue of job-skill mismatch, thereby providing context to our research objectives and a foundation for the following analyses and discussion.

As in most industrialised countries, the proportion of the Australian labour force that is highly educated (e.g., those people who hold university degrees and/or postgraduate qualifications) has increased substantially over recent decades. In contrast, the proportion with vocational qualifications has not grown at the same pace (refer to Section 3 for specific details). In parallel with this labour force transformation has been a technological revolution in the workplace, centred on the development of the microchip and the computer. With this backdrop, many labour market observers have reported a rise in the incidences of job-skill mismatch, that is,

an increase in the proportion of the labour force that is employed in jobs that are inferior to their skills or educational qualifications (see Groot & van den Brink, 2000, for a meta analysis of the incidences of job-skill mismatch across countries). In addition, there is concern that these developments harm the position of Australia's less skilled workforce, for example, in their ability to obtain employment and/or to earn an acceptable wage.

2.1 Overeducation: The Underutilisation of Skills

The causes and consequences of job-skill mismatch are covered extensively in the *overeducation* literature. "Overeducation is a form of labour underutilisation which occurs when the formal education level of a worker exceeds that which is required for the job" (Linsley, 2005a, p.1).

Broadly, this overeducation literature argues that the skill requirements of jobs have not changed significantly in recent decades while levels of formal education have been rising. This has contributed to a general underutilisation of skills in the labour market (Spitz-Oener (2006)). It has been argued that the increased proportion of highly educated people in the labour force has resulted in these people occupying jobs that were previously held by the lower educated, a process that is generally referred to as *bumping down* or *crowding out* (Borghans & de Grip, 2000). However, if the growth in supply of highly educated labour has outpaced the growth in demand for their higher skills, we would expect to see a fall in the inequality of the distribution of earnings. This will occur because the competition for high education jobs forces their wages down, and/or because highly educated people have to accept lower level (and pay) jobs. In either case, earnings inequality will *fall*. This is at odds with what we actually observe for Australia, which is a *rise* in earning inequality (i.e., growth at the top of the earnings distribution has been faster than at the bottom of the distribution). This piece of evidence casts doubt on the overeducation story.

The incidences of overeducation ranges between 10 per cent and 40 per cent in Europe and the UK (refer to Groot & van Brink, 2000). In Australia, Linsley (2005b) found that 27 per cent of individuals were overeducated. Amongst those with vocational qualifications, 18 per cent of males and 22 per cent of females were overeducation (Linslay, 2005a). It is interesting to note, however, that the rate of undereducation¹ was higher at 22 per cent for males and 30 per cent for females. Similarly, as we show later, in 2003, 32 per cent of Australian managers, 9 per cent of professionals and 35 per cent of associate professionals had no post-school education, although the ABS classifies these occupations as requiring a bachelor degree or at least a diploma. At the same time, 9 per cent of elementary sales and service workers had a bachelor degree or higher. This indicates that, at the high levels of aggregation that you get in the 1 digit occupation groups, there is only a loose link between occupation and qualifications. The link is tightest for 'professionals' and 'trades' occupations. It also suggests that the notions of bumping down or crowding may not accurately reflect what is occurring across all occupations in the Australian labour market.

¹ Undereducation is the opposite of overeducation. It is taken to mean a level of educational attainment by workers that are less than the educational requirements of their jobs.

It is also important to appreciate that skills and educational qualifications are not the same thing. For the whole workforce, there is only a loose match between formal qualifications and the job that is done. Of course, this relationship is tighter in jobs that require licensing or other forms of accreditation in order to perform them, such as electrician or pilot. Hence, when analysing job-skill match it is important to view the term ‘skills’ more broadly than simply a worker’s highest educational qualification. Unfortunately, many of these skills (e.g., attitudes, motivation, ambition, reliability) are hard to measure, or at least are rarely measured.

2.2. Technological Change

An alternative technological change literature has been used to explain recent labour market and wage trends (see Chennell & van Reenan, 1999 for a comprehensive review of the skill-biased technological change hypothesis). This literature argues, firstly, that the computerisation of many workplace tasks has led to an alteration in the skill requirements of jobs (Spitz-Oener, 2006). Secondly, this skill-biased technological transformation has increased the productivity of highly skilled employees relative to less skilled workers (Card & DiNardo, 2002).

A few studies have attempted to analyse the mechanisms by which technological change translates into demand for higher skills. One recent study by Autor, Levy and Murnane (2003) argues that computer capital substitutes for a limited and well-defined set of human activities, those involving routine cognitive and manual tasks, and complements activities involving non-routine problem solving and interactive tasks. Their framework shows how, computerisation changes the composition of job tasks, which in turn changes the skill demands of jobs.

Thus, modern technology has led to an increased demand for skilled labour relative to less skilled labour and resulted in a corresponding rise in the relative wages and employment of the more skilled. In advanced economies such as Australia’s there are generally limits to how far the wages of less skilled workers can fall (e.g., due to minimum wages, trade union pressure, the existence of social welfare etc.), therefore, some unemployment for less skilled workers is inevitable (Chennells & van Reenan, 1999). Technological change has also, on this argument, increased the demand for cognitive (problem solving) and interactive skills relative to manual dexterity.

Both the overeducation and technological change literatures are consistent with the stylised fact that higher educated people tend to obtain jobs that used to be held by lower skilled people (Borghans & de Grip, 2000). Both perspectives also share a pessimistic outlook for low-skilled workers (Borghans & de Grip, 2000). From the overeducation viewpoint, low-skilled workers will be bumped down to the least favoured jobs or will be crowded out into unemployment, whereas, the upgrading standpoint predicts that low-skilled workers will become marginalised, because their skill level and type no longer meets the minimum requirements of the labour market. One consequence of technological change for people with vocational qualifications is that some of their skills have become redundant or downgraded, relative to the newly valued skills such as cognitive competence.

We note that technological change is not the only force at work that is shaping the types of skills demanded in the Australian economy. Globalisation and growing average incomes are also driving a shift away from the production of goods towards

the production of services. Some of these require high level skills, while others (such as cleaning and caring) do not. This is leading to a more polarized labour market, with growth in demand for high end and for low end skills, but little growth in demand for middle level skills. These developments are highly significant for the vocational education sector, which traditionally has served the middle level skill sector.

2.3. Theoretical Perspectives in Job-Skill Matching

A number of theoretical models have been used to explain imperfect job-skill matching, and in particular overeducation. These models also provide some explanatory perspectives on the issue highlighted above, that there are indeed unqualified people found in higher skilled occupations. These include search and matching theory, job assignment model, career mobility theory, job-competition model and the spatial mobility model.

According to *search and matching theory*, mismatches are the result of imperfect information. On the demand side, firms are assumed to have imperfect information about individual worker productivity and hence they use education as a signal to infer worker ability (*signalling model*). On the supply side, new labour market entrants have imperfect information about job types and characteristics and hence may take up jobs for which they are overeducated. However, it is assumed that as each worker accumulates information they will tend to move to jobs where there is a match.

The *job assignment model* (Sattinger, 1993) uses matching theory. In this model job-skill mismatch is a problem of assigning workers to job. The allocation of workers is optimal when the most competent worker is assigned to the most complex job and the least competent worker is assigned to the simplest job. Hence, imperfect job-skill matching represents an allocation problem in assigning heterogenous workers to heterogenous jobs.

The *career mobility theory*, like *human capital theory*, assumes that formal education, experience and on-the-job training are substitutes and each is positively related to worker productivity. The model proposes, “new entrants to the labour market with high levels of formal education accept positions for which they are apparently overeducated whilst they gain experience” and occupation-specific or industry-specific training human capital via training which will inevitably improve their future labour market prospects (Linsley, 2005a, p. 4).

Thus for human capital theory, matching theory and career mobility theory the discrepancy between actual educational attainment and that required for the job represents a temporary mismatch along a career path.

The *job-competition model* (Thurow, 1975; 1979) implies that good job-skill match is contingent upon the differing skill endowments (e.g., work experience, on-the-job training, cognitive skills, and personal qualities, such as reliability and punctuality) of workers. In this model, there exists a notional queue of workers competing for jobs in the labour market. A worker's position in the queue is determined by the employer's expectation about how much they will cost in terms of training to fit the employer's job. Essentially, those at the head of the queue are perceived by the

employer to be cheaper to train to a level that meets the precise requirements of the enterprise, and thus are hired first. Thus, the job-competition model provides a practical framework for isolating the key components or predictors of job-skill mismatch within a group of people with comparable formal qualifications (e.g., tradespersons, an occupation that extensively uses VET qualifications).

Spatial mobility theory (Buchel and van Ham, 2003) suggests that workers are limited in their ability to commute or migrate. As a result, they limit their job search to a smaller local market that invariably has comparatively fewer, suitable job opportunities.

Linsley (2005a) tested four theories (human capital, job-competition, assignment and career mobility theories) that have been used to explain overeducation and found that the job-competition model best explains the existence of overeducation in Australia.

2.4 Empirical Evidence

Many studies have sought to examine the causes of job-skill mismatch, in particular overeducation. The key findings from a small sample of these studies are described below.

Guided by the job-competition model, Buchel & Pollmann-Schult (2001) examined the role of school achievement and vocational training quality², on the later risk of overeducation. They measured overeducation using the subjective approach in which workers themselves report which qualifications are usually required to perform their jobs. Their analyses used cross sectional data from 1274 participants in the longitudinal German Life History Study. Using probit models, they found an above-average level of school achievement and the choice of a high quality vocational training certificate significantly reduced the risk of job-skill overeducation. Buchel and Pollmann-Schult also investigated the strength of a number of other variables including, age, gender, parent's nationality, and the number of children below the age of seven years living in the household, in predicting overeducation. However, they found that "within a group of respondents with similar formal educations, skill endowments are markedly more important in determining the risk of overeducation than measures of socio-economic status" (p. 20).

Using a similar self-report measure of overeducation, Witte and Kalleberg (1995) examined a number of variables hypothesised to influence the likelihood of a worker being employed in a position that fits their vocational training. Their study used cross sectional and longitudinal data from the German Socio-Economic Panel. Using logistic regression techniques, Witte and Kalleberg found that the likelihood of a close fit declined over the course of an individual's working life. They interpreted this finding from a sociological life-course perspective. That is, they suggest that vocational education is likely to be a more important source of skills early in an individual's career, and to erode over time as work experience and on-the-job training accumulate.

² Quality of vocational training was operationalised by its employment prospects, i.e., the rate of unemployment in the specific occupation at the time the respondent embarked upon vocational training.

Linsley (2005b) used data from the Negotiating the Life Course survey to examine the incidence and effects of overeducation in Australia. She used a subjective, self report measure of overeducation where the level of education workers believe they require to obtain or perform their jobs is compared to their actual education level. Linsley found that 27 per cent of individuals were overeducated and that the rate of overeducation was higher among those who are young, have pre-school aged children, work in large firms and have fewer years of tenure.

Using data from the Longitudinal Survey of Immigrants to Australia, Kler (2005) investigated the incidences, determinants and returns to overeducation amongst tertiary qualified immigrants on visas with 'higher skill requirements' during the early phase of their settlement in Australia. Using an objective job analysis measure to calculate overeducation³ they found that immigrants from non-English speaking backgrounds had higher and persistent rates of overeducation compared to immigrants from English speaking backgrounds.

Hensen and deVries (2004) investigated the relationship between geographical mobility⁴ and overeducation in the Netherlands, using data about school-leavers from secondary education and higher vocational education in the period 1996-2001. Using the subjective self-report method to measure overeducation, they found that school-leavers who were mobile had a lower probability of overeducation compared with school-leavers who were not mobile.

Existing literature thus suggests the following factors increase the risk of being in a job that is not commensurate with one's skills/qualification:

- Low quality of education/training
- Relatively low demand for the skill on completion of the course
- Lower levels of ability, for a given level of education
- Being younger
- Having pre-school aged children
- Working in large firms
- Being from a Non-English speaking background (at least among recent migrants)
- Having lower geographic mobility.

We use these findings to shape our own analysis of Australian data.

³ "For each respondent the occupation code of their job was recorded using 1996 ASCO codes (ABS, 1997). ASCO codes provide a detailed list of minimum required qualifications to undertake a particular job. This information can be compared to the education qualifications of the respondent, and if these qualifications exceed the job requirements as stated the respondent is defined as either being overeducated or adequately educated" (Kler, 2005, p. 17).

⁴ Geographical mobility was measured as the distance between the location of education and the current job (Hensen and deVries, 2004)

3. Structural Change

In this section, we illustrate the structural change that has occurred in the Australian economy, and examine the implications for the demand and supply of different skills. In doing so, we answer the following questions:

- How has the overall occupational pattern of employment in Australia changed over the past decade and how has this affected people with VET qualifications?
- What occupations utilise VET qualifications/skills and has this changed over time?

3.1 Implications of Structural Change for Job-Skill Matching

Labour market outcomes are the result of a complex interplay between supply and demand conditions. In general, some workers will be unable to find jobs that sufficiently match their skills if the number of jobs that require these skills falls below the number of people who possess them and are actively looking for jobs related to their skills. Furthermore, qualifications and other skills take some time to acquire and once obtained are not readily modified to accommodate structural changes in the labour market. Thus one reason why there can be a mismatch between worker's skills and the jobs they have is that there has been structural change in the economy that exceeds the natural pace of change in the skill structure of the workforce.

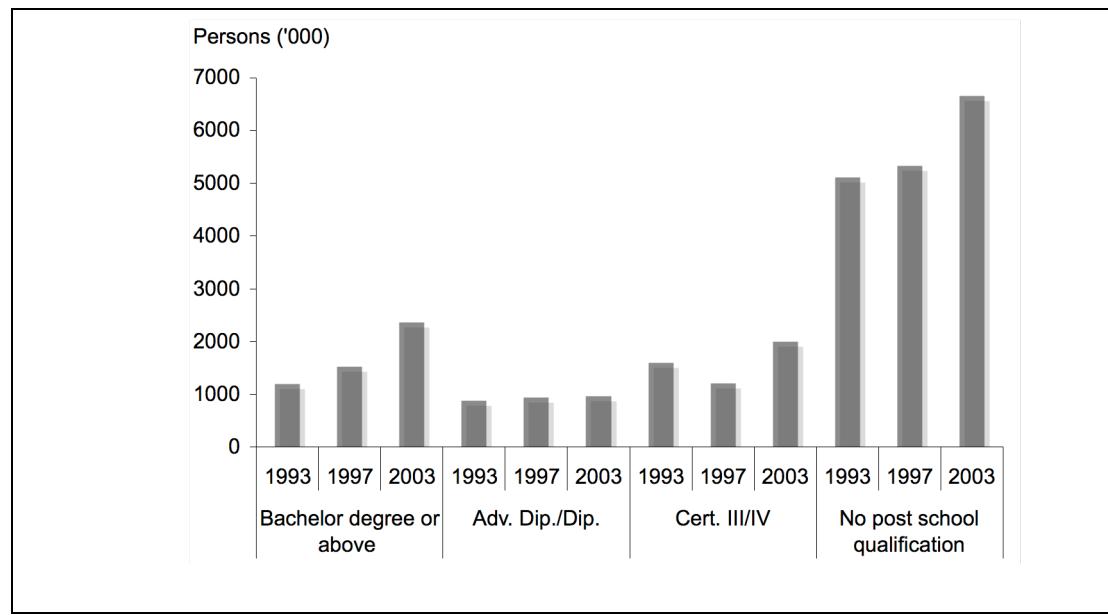
3.1.1 Change in skill levels

Whilst Australia's working age population has risen by 11 per cent between 1993 and 2003, corresponding growth in the skill or educational composition of the working age population was been uneven. Figure 1 shows that there has been a dramatic increase in the proportion of the working age population that holds a higher (university) degree. In contrast, the proportion with vocational qualifications fell. In 1993, 33 per cent of the working age population had VET qualifications (consisting of Advanced diploma/Diploma, Certificate I, II, III and IV), 13 per cent had university degrees while 54 per cent did not hold a post-school qualification. Between 1993 and 2003, although overall numbers holding each level of qualification increased, only those holding university qualifications increased their share in the working aged population. The proportion with university degrees grew by 46% from 13% of the working age population to 19% (unsurprising considering the number with university degrees increased by 98%) while the proportion with VET qualifications fell by 11% (from 33% to 29%) and the proportion with no post-school qualifications fell by 4% (from 54.5% to 52.2%). The fall in the share of the working age population holding a VET qualification between 1993 and 2003 comprised no growth in the numbers with diplomas, some growth in the numbers with Certificate III/IV, and little or no growth in other VET qualifications.

In summary, over the last decade to 2003, people with VET qualifications constituted about a third of the labour force but this proportion fell by 4 percentage points over time while the share with no post-school qualifications has remained at just over half the labour force, though falling by 2 percentage points. In contrast, there has been a

steady rise (of 6 percentage points) in the share of the working age population with university qualifications.

Figure 1: Distribution of the Highest Qualifications in the Working Aged Population



Data source: ABS CURF data from the Education and Training Survey spanning years 1993 and 1997 and the Education and Work Survey (2003).

In our judgement, the apparent dip in the numbers of people with Certificate III/IV between 1993 and 1997 is likely to be caused by sampling error or coding problems.

Both men and women are more likely to participate in the workforce if they have more education. For example, in 2003, among working age people with degrees, 89 per cent (men) and 85 per cent (women) were in the workforce. The comparable figures for those without post-school qualifications were 68 and 46 per cent (NATSEM, 2006, Figure 9). This means that the changes in *employment* have amplified the changes in the educational qualifications of the *population*. Of the extra 1.4 million employed people between 1990 and 2003, almost 1 million had university qualifications compared to an extra 244,000 who had vocational qualifications. The remainder (166,000) had no post-school qualifications. (NATSEM, 2006, table 2). It is clear that there has been a strong shift in the pattern of labour demand away from vocational qualifications towards university qualifications. This is not to say that everyone with a university qualification was employed in a professional or management job. But it does support the view that people with vocational qualifications have been facing a labour market with a declining (relative) appetite for their skills and a growing preference for university qualifications. This provides support for the 'bumping down' hypothesis, and for the view that structural change in the economy is reducing the number of jobs that require or value VET qualifications. Both developments will increase the prospect that some people with vocational qualifications are unable to find work commensurate with their qualification.

3.1.2 Mapping occupations to skills

The ABS has created a hierarchically structured occupational classification framework, in which groups of occupations are classified and distinguished from one another on the basis of skill level. In this structure skill level is a function of the range and complexity of the set of tasks involved in an occupation, such that, the greater the range and complexity of the set of tasks, the greater the skill level of the occupation. The criteria used to measure skill level is the formal education and/or training and previous experience usually required for entry to the occupation. At the highest level of aggregation, this has resulted in nine major occupational groups (or nine 1-digit ASCO occupations) ranked by skill levels or requirements. At the level of aggregation that is necessary to reduce the vast array of jobs to 9 categories, there is inevitably much variation within each category. This structure is illustrated in Table 1, below.

While this structure is theoretically sound, the reality is that many people work in higher level jobs without having the qualifications that are identified in Table 1, and many others work in lower level jobs, but do have post-school qualifications, even though these are not required.

Table 1: ASCO major groups, skill level and typical education and experience

Major group	Skill level	Education and experience
Managers	I	Bachelor degree or higher, or at
Professionals	I	Least 5 years relevant experience
Associate Professionals	II	Diploma/advanced diploma, or at least 3 years relevant experience
Tradespersons	III	AQF Certificate III or IV, or at
Advanced clerical & sales	III	Least 3 years relevant experience
Intermediate service	IV	AQF Certificate II, or at least
Intermediate production	IV	1 years relevant experience
Elementary service	V	Compulsory schooling or AQF
Labourers	V	Certificate I

Note: AQF is the abbreviated form of -Australian Qualifications Framework

Source: ABS (1997)

An alternative way of mapping occupation with skill level is to identify where people with VET and other qualifications are actually employed. By identifying the percentage of workers in each occupational group that have degree, VET or no post-school qualifications we can create occupation-education clusters. We do this in Table 2. A VET occupation is defined as one where at least 60 per cent of workers in that occupation hold a VET qualification as their highest level of qualification. A University/VET (mixture) occupation is one where at least 20 per cent of workers hold a degree, at least 20 per cent have a VET qualification, and no more than 20 per cent have no post-school qualification.

Table 2: Definitions and criteria of occupational education clusters

Occupational education clusters	Percentage of employed people aged 25-49 years in the occupation whose highest educational qualification is –		
	<i>Bachelor degree or above</i>	<i>VET qualifications</i>	<i>No post-school qualifications</i>
University occupations	Greater than or equal to 60%	Less than 20%	Less than 20%
University/ VET occupations	Greater than or equal to 20%	Greater than or equal to 20%	Less than 20%
VET/university/no-post school occupations	Greater than or equal to 20%	Greater than or equal to 20%	Greater than or equal to 20%
VET occupations	Less than 20%	Greater than or equal to 60%	Less than 20%
VET/No post-school occupations	Less than 20%	Greater than or equal to 20%	Greater than or equal to 20%
No post-school occupations	Less than 20%	Less than 20%	Greater than or equal to 60%

Source: Modified from BLS (2004: 2)⁵.

We apply these criteria to construct occupation clusters that are relatively intensive users of VET qualifications. The results are presented in Table 3. From Tables 2 and 3 it can be seen that the only VET occupation is Tradespersons and related workers, while there are other mixed-skill occupations that use VET skills as well as other skill levels. These occupation-education clusters are used, in turn, to quantify the impact of structural change in the economy on the demand for vocational qualifications.

Table 3: Occupational education clusters

Occupational education clusters	Occupations
University occupations	Professionals
VET/university/no-post school occupations	Managers & administrators; Associate professionals.
VET occupations	Tradespersons & related workers
VET/No post-school occupations	Advanced clerical & service workers; Intermediate clerical, sales & service workers.
No post-school occupations	Intermediate production & transport workers; Elementary clerical, sales & service workers; Labourers & related workers.

3.1.3 Change in occupation-education patterns of employment

Employment share by occupation

Data from the ABS labour Force Survey show that at the highest level, VET and VET-associated occupations had almost the same share of total employment in 2005 (54.0%) as they did in 1996 (53.1%).⁶

⁵ The modifications mainly include: (1) The age scope of the employed persons in each occupation is extended to a range between 25 and 49 years (i.e., the prime-aged group), rather than 25 to 44 years as in the BLS' grouping. (2) The education and training qualification categories are grouped into three classes: Bachelor degree or above; VET qualifications; and No post-school qualifications.

Cully (2003) used Census data to estimate changes in the occupational pattern of employment between 1986 and 2001⁷. The change in employment level was estimated for the broad 1-digit ASCO level of occupation. In 1996, the occupational classification changed. This meant that in 1986, occupation was coded to the first edition of ASCO while in 2001 it was coded to the second edition. To allow reliable analysis of change between the 1986 and 2001 estimates, Cully used the concordance matrix provided by the ABS to convert the 1986 data of the occupational composition of employment to the second edition of ASCO.

Table 4 shows the change, both in numbers and in share of employment by occupation. It can be seen that the Tradespersons occupation experienced a 3.7% decrease in share of employment and a fall of 13,300 in the absolute numbers of people employed in trades jobs. The Tradespersons occupation was the only occupation to experience this decline, and as already demonstrated (refer Tables 2 and 3) is the occupation that most intensively uses VET skills. Had the rate of Trades jobs growth matched the economy-wide average, there would have been an additional 301,200 Trades jobs in 2001.

Clearly, this decline in employment share for the Tradespersons occupation impacted adversely on the employment rate of the VET qualified workforce. In addition, there was also a decrease in the share of employment of Advanced Service, Intermediate Production workers and Labourers. Advanced Service workers are one of the mixed-skill occupations identified as a major user of VET qualifications. Thus, this also contributed to the negative impact on employment for those with VET qualifications.

Table 4: Change in the occupational composition of employment, 1986 to 2001

	Employment share 2001 Census %	Employment share 1986 Census %	Change in share %	Change in employment (000s)
Managers	9.5	8.9	0.5	202.7
Professionals	18.7	15.5	3.2	534.1
Associate professionals	12.0	11.1	1.0	274.0
Tradespersons	12.5	16.2	-3.7	-13.3
Advanced service	4.2	5.2	-1.0	7.7
Intermediate service	16.7	13.8	2.7	480.4
Intermediate production	8.1	10.0	-1.9	26.1
Elementary service	9.5	8.9	0.6	208.1
Labourers	8.8	10.5	-1.6	52.3
Total	100.0	100.0	0.0	1093.5

Source: Cully 2003, Table 3

Note that these data are for 2001, the date of the last Census. Since that time, there has been an upturn in the employment of tradespersons, due in large part to the growth in Construction and Mining. Between 2001 and 2006, employment in mining has increased by 66% while employment in construction has increased by 35%⁸.

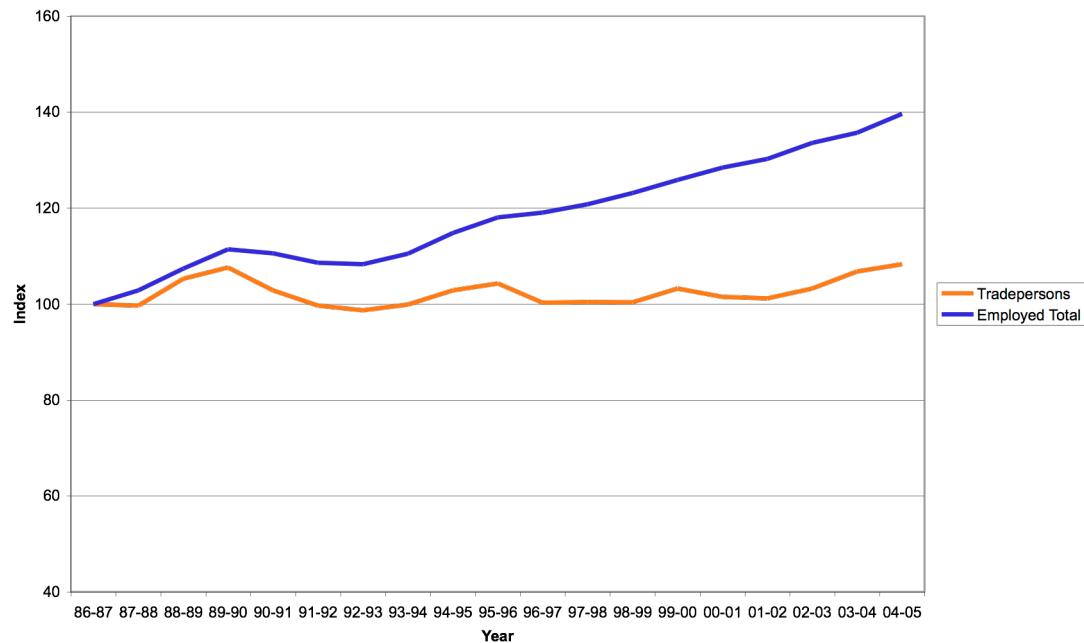
⁶ Calculated from ABS Labour Force, Australia, Detailed, Quarterly data cube, E07, catalogue number 6291.0.55.001.

⁷ Cully, 2003, Pathways to Knowledge Work, NCVER

⁸ ABS, Australian Labour Market Statistics, Catalogue Number 6105.0, April 2006

Figure 2 shows the growth in employment in all jobs between 1986 and 2005 compared with the growth in trades jobs. It can be seen that between 1986 and 2001, while there were some fluctuations, there was no growth at all in the number of people employed in trades jobs. Since 2001, an increase in trades jobs approximately in parallel with the growth in overall employment. There is every reason to believe that this is cyclical and caused by the minerals and construction booms.

Figure 2: Growth in employment in all jobs, and in trades jobs: 1986-2005, 1986 = 100



Source: ABS cat. 6291.0.55.001 data cube E08 Labour Force, Australia, Detailed - Electronic Delivery, Jun 2005

Employment by skill /qualification level

Table 5 illustrates the change in the skill composition of employment between 1986 and 2001. The decrease in the employment share of Tradespersons is reflected in this table with a decrease in employment share for those with skill level III. Considering that those with skill level III are classed as holding certificate III/IV (VET qualifications) and that Figure 1 shows some growth in the number of people holding these qualifications, this decrease in employment share supports the view that people with VET skills are 'bumped down' the occupational skill ladder because of a relative decline in occupations that require their skills. Specifically, when people with VET skills lose their job, or for some other reason try to find a new job, the decline in jobs that require their qualifications, relative to supply, will increase the chance that they will have to accept inferior employment.

Table 5: Change in the skill composition of employment, 1986 to 2001 (per cent)

Skill level	1986 share of employment	1996 share of employment	Change in employment share
I	24.4	28.2	3.8
II	11.1	12.0	1.0
III	21.4	16.7	-4.8
IV	23.7	24.8	1.1
V	19.4	18.3	-1.0

Source: Cully 2003, Table 4

Table 6: Percentage of employed persons (aged 25-49 years) at 1-digit ASCO occupation level, by highest qualification

Occupations	Bachelor degree or above		VET qualification		No post-school qualifications	
	1997	2005	1997	2005	1997	2005
Managers & administrators	26.1	33.4	36.7	34.0	35.6	32.6
Professionals	61.9	70.3	26.4	19.1	10.3	10.6
Associate professionals	13.3	22.1	42.8	41.7	41.8	36.2
Tradespersons & related workers	2.3	3.8	70.7	63.1	24.7	33.1
Advanced clerical & service workers	7.6	14.0	41.9	37.3	48.3	48.7
Intermediate clerical, sales & service workers	8.0	11.8	35.7	37.2	53.8	51.0
Intermediate production & transport workers	3.0	3.7	31.0	28.5	65.0	67.8
Elementary clerical, sales & service workers	6.7	7.4	29.5	23.2	62.0	69.3
Labourers and related workers	2.0	4.3	25.5	25.3	70.6	70.4

Data source: ABS CURF data from the Education and Training Survey 1997 and the Education and Work Survey 2005.

Note: The 1997 figures do not add to 100% across the rows as some employees' qualifications were undefined in the 1997 data

Table 6 shows the percentage of employed persons by highest qualification for each 1-digit ASCO occupation level. This allows analysis of within-occupation change in skill composition. It can be seen that between 1997 and 2005, there was some decline in the skill composition for tradespersons. While those with VET qualifications still dominated this occupation in 2005, the percentage who had no post-school qualification appears to have risen over the period, from 25 to 33. We say, "appears" because the data are taken from two different surveys and this always raises some concern about their precise comparability, even though both surveys are done by the ABS. For managers and administrators there was a decrease in the proportion with no post-school qualifications and an increase in those with University qualifications.

There was a similar pattern for almost all occupations - the proportion of University graduates was higher with a corresponding decrease in those with either VET qualifications or with no post-school qualifications. In every occupation except intermediate sales and service and labourers, there was a fall in the proportion of employed people with VET qualifications. Note that at both dates a quarter of

employed, prime age adults working as labourers or related workers had vocational education qualifications.

For those with University qualifications, there has been an increase in their employment share in the labour force (the increase in share for skill level I in Table 5) and an increase in employment share for University occupations (See Tables 2 and 3). Adding to this, the percentage of employed persons with a bachelor degree or above has increased in most occupations between 1997 and 2005 (see Table 6).

The pattern of employment, classed as proportions of people employed in each major occupation, has changed very little for those with no post-school qualifications. There has, however, been a decrease in the share of employment when looking at the whole workforce for people with this level of skill (see Table 5). This is represented by the 1 per cent reduction in share of employment for those with skill level V.

Table 7 shows the proportions within each highest qualification category held that are employed in each occupation. As would be expected, the majority of those holding a university degree are employed as professionals, and this has not changed much between 1997 and 2005. There has been a decrease between 1997 and 2005 in those employed as professionals, with an increase in the proportion employed as associate professionals. In 2005, those holding VET qualifications were mainly employed as tradespersons (23%), intermediate clerical, sales & service workers (18%) and associate professionals (15%). Those with no post-school qualifications are mainly employed in the less skilled occupations as intermediate clerical, sales & service workers, intermediate production & transport workers, elementary clerical, sales & service workers and labourers and related workers. The distribution of employment by highest qualification has seen modest change between 1997 and 2005 for every level of qualification.

This general pattern of decline in the proportion of VET qualified workers and increase in the proportion of University graduates across occupations (with the exception of the Trades) is consistent with the stylised fact that higher educated people tend to obtain jobs that used to be held by lower skilled people, possibly due to either to an excess supply of highly educated workers or due to a increase in the skill requirements of jobs.

Table 7: Percentage of employed persons (aged 25-49 years) within highest qualification at 1-digit ASCO occupation level

Occupations	Bachelor degree or above		VET qualification		No post-school qualifications	
	1997	2005	1997	2005	1997	2005
Managers & administrators	11.3	11.3	8.0	7.8	7.3	6.0
Professionals	65.3	57.8	14.3	10.7	5.2	4.7
Associate professionals	8.3	12.0	13.5	15.4	12.3	10.7
Tradespersons & related workers	1.6	2.0	24.3	23.3	8.0	9.8
Advanced clerical & service workers	1.7	2.3	5.0	4.2	5.3	4.4
Intermediate clerical, sales & service workers	7.1	8.3	16.4	17.9	22.5	19.6
Intermediate production & transport workers	1.4	1.3	7.2	7.1	14.3	13.5
Elementary clerical, sales & service workers	2.4	3.3	5.5	7.0	10.7	16.8
Labourers and related workers	0.9	1.6	5.8	6.5	14.5	14.4
Total	100.0	100.0	100.0	100.0	100.0	100.0

Data source: ABS CURF data from the Education and Training Survey 1997 and the Education and Work Survey 2005.

Table 6 and 7 also show that although the number of university graduates is increasing, there are still a large number of people with VET qualifications or no post-school qualifications who are employed in high-skilled jobs. Table 7 shows that almost 19 per cent of degree-holders worked in trades or lower skilled jobs in 2005 for which they appear to be overeducated. As mentioned in section 2, it is important to realise that education is not a perfect indicator of skill. Quality of education/training, completion of a course that is in relatively low demand, differing levels of ability independent of education, age, family commitments, geographical mobility and levels of work experience and job tenure can all have an effect on obtaining a job commensurate with level of qualification obtained. These factors work in differing directions to explain both apparent overeducation and apparent numbers of unqualified people working in high skilled jobs.

The decision of an employer to hire an applicant can be thought of as weighing up various attributes. This can explain perceived mismatch for a proportion of employees between highest qualification as an indicator of skill and job held in tables 6 and 7. The highest qualification obtained is one of many attributes to be considered and although it may have a high weighting in the employer's decision to employ (or not to employ), factors such as work experience, employability skills and attitudes towards work (motivation, ambition and maturity) are examples of attributes that also carry weight and will influence this decision. These attributes can be divided into two groups-those observable in the data and those only known to employers responsible for hiring decisions.

In the data analysis undertaken in this report (see discussion in section 4), the findings are based on observable characteristics such as highest qualifications,

demographic characteristics and work experience. It is not possible to obtain data on many employability skills such as communication skills, presentation of the applicant and the way in which their attitude towards work was perceived when and if they were interviewed for the more highly skilled jobs. These unobservable employability skills and attitudes can explain in some part the phenomenon of those holding university degrees working in less skilled occupations and also those seemingly unqualified workers employed in occupations above their skill level seen in tables 6 and 7.

Webster and Jarvis (2003) analysed patterns in tradesmen's career paths. They found that there are different paths to skill acquisition in the trade occupations. These different paths (or streams as Webster and Jarvis call them) appear to have arisen out of a desire for cost efficiency in employment. The most common path is the traditional completion of a VET trade qualification but there is also a path for unskilled workers to learn by on-the-job training. This pathway for less-skilled workers also offers an explanation for the apparent level of unskilled workers in the trades. Although these people do not hold VET qualifications, it cannot necessarily be said that they are unskilled. Both pathways into trade work can be supplemented by short training courses for employees. These training courses can assist in upward career mobility, moving those with trade qualifications into higher skilled jobs.

A more insightful perspective on change in job-skill match can be obtained by following people over time. This normally requires longitudinal data that repeatedly surveys the same people over time. Such data are expensive to collect and take many years to yield valuable information. Martin (2006) used a synthetic cohort strategy, based on Census data, to provide a short cut to such analysis examining occupational career pathways⁹. He took the number of people in a 5-year age cohort in an occupational group at one census and compared it with the number of people in the same cohort (now 5 years older) in the occupational group at the next census. This gives a sense of the minimum flows into or out of occupational groups, although it cannot measure exactly how many entered an occupation due to some people leaving the occupation during the 5 year period (thereby reducing the total number in the occupation).

Martin (2006) found that people enter occupational/skill groups in varying ways. Occupational inflows and outflows are shown in Table 8. People enter managerial occupations at a fairly steady rate until age 40 and there is no net outflow until a cohort reaches the age of 45. Flows into professional occupations are heavily concentrated at the beginning of the career-until about age 30. Associate professionals show a similar pattern though not as pronounced as professionals. Professionals and associate professionals, as with managers, show no net outflow until their mid-40s.

Tradespeople follow a different pattern. People gain their trade qualifications early and mostly obtain a trade job in their early 20s. Almost as soon as they qualify as tradespeople, they begin to leave the occupation, with a net outflow from the trades at every subsequent age group. This pattern of early inflow then continuous outflow applies also to the lower skilled occupations. There is an exception, however, among

⁹ Martin, Bill 2006, Skill Acquisition and Use Across the Life Course: Current Trends, Future Prospects, National Institute of Labour Studies

salespeople where there is a small net inflow between the ages of 35 and 50. This is due to women returning to the workforce (thought to be as their children get older) and taking these jobs.

Martin (2006) found that there appeared to be no major changes in these skill utilization patterns through the life course, comparing the 1980s with the 1990s. The pattern for those with VET qualifications is consistent with the reduced employment share for VET occupations. But people with Trades qualifications stand out as beginning to leave trades jobs in the first period after they qualify, with a continuing outflow at every age from then on. There is something about employment in the trades (at least between 1986 and 2001) that means that people do not want to spend long periods in these jobs, or cannot find continuing employment. The reasons probably include the decline in aggregate employment in the trades, relatively low pay and little pay progression with more experience. It is clear from this pattern that any problems with shortages of tradespeople is a problem of retention in the trades, rather than of the quantity of new entrants and levels of training.

The ongoing number of unqualified people in trades occupations seen in tables 6 and 7 (between a fifth and a third of employees in trades held no post-school qualifications over the last decade) may also be able to be explained in part by the occupational inflows and outflows shown in table 8. The difficulty in retaining qualified tradespeople after they reach their early 20s can be expected to cause some shortages in these occupations. The vacancies may be filled by people who do not hold trades qualifications, simply because somebody is needed to do the job. In saying this, we note that a small number of Australian government and non-government surveys have been undertaken to attempt to discover why employers hire unqualified tradespeople. These found that difficulty in recruiting trained workers is not a major reason why employers hire unqualified people. Trades employers experiencing skills shortages do not appear more likely to employ unqualified workers than other employers.

Table 8: Occupational inflows and outflows, 1986-91 and 1996-2001⁺

Occupational group	Age cohort at beginning of period							
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54
1986-1991								
Managers	26700	37700	38800	33100	13900	-1000	-13400	-17600
Professionals	79800	40900	3000	2300	-1100	-5600	-11800	-14500
Paraprofessionals	29800	16300	9500	1800	2200	-2700	-4900	-5100
Tradespersons	28900	-40400	-20700	-26600	-21600	-23000	-17400	-16400
Clerks	55400	-59500	-24200	-6800	-6600	-8700	-10200	-21800
Salespersons	-1500	-25800	-900	4800	5600	5400	-6200	-11300
Labourers	31800	-41300	-15800	-16000	-17700	-3700	-29900	-43600
1996-2001								
Managers and Administrators	14600	28800	27900	19000	10600	-7100	-20300	-28400
Professionals	107200	75800	3400	10800	7200	-4400	-9400	-20800
Associate Professionals	61500	37500	11600	9200	1600	10600	-11600	-16400
Tradespersons and Related Workers	61800	-22800	-13100	-14300	-10600	-5300	-6000	-14700
Advanced Clerical and Service Workers	15500	-6200	-12500	-7400	-300	-5100	-6800	-8600
Intermediate Clerical, Sales and Service Workers	107300	-35400	-14400	3200	11300	4500	-7100	-16700
Intermediate Production and Transport Workers	14400	1900	-4000	-13100	7200	-5400	-11500	-13600
Elementary Clerical, Sales and Service Workers	-53000	-49400	-6000	-1600	600	11700	-5600	-10000
Labourers and Related Workers	-10500	-20600	-13300	-10400	-7300	-8600	-12900	-8300

Source: Calculated from Household Sample Files for 1986-2001 censuses. Excludes those who migrated to Australia during each period.

+The table shows the net increase or decrease in the number of people in each age cohort in each occupation across the period specified. For example, amongst the cohort aged 15-19 in 1986, there were 26,700 more managers in 1991 (when they were aged 20-24) than in 1986. Negative figures indicate a decrease in the numbers in a cohort in an occupation across the period specified.

4. The Characteristics of People who are Employed Below Their VET Skill Level

In this section we use ABS and other data to identify those factors that characterise people who are employed below their VET qualifications. In doing so we seek to address the following questions:

- What socio-economic and demographic factors are associated with employment in jobs that do not use people's VET qualifications?
- Which of these factors can be seen to have the most impact on the employment outcomes of people with VET qualifications?

Firstly, we reiterate that the diversity of the labour market and its participants adds a level of complexity to analyses of job-skill match. The labour market comprises many sub-markets, some of which link less easily than others to the main or other markets. Location is an important factor that separates labour markets. Even within the major cities, the prospect of long commuting times will deter workers from applying for some jobs. This is especially the case for part-time or casual work, and for women (and men) who have major care responsibilities and thus need to be within reach of home or school. Labour markets are often also divided by industry, where tacit knowledge about how the industry works (e.g., the building industry in contrast with the not-for-profit welfare sector) can be important. The presence of geographical and other barriers to the matching of workers to jobs means that it is likely that there will co-exist vacancies that require particular skills, on the one hand, and under-employed workers with those skills, on the other hand.

Workers too are heterogeneous, including workers with similar educational qualifications. As described in our literature review (section 2) the productivity of a particular person in a particular job is dependent on a number of variables, only one of which is the highest qualification of that person. Further, a qualification is only one, albeit an important one, of the set of skills that are frequently expected by an employer when they recruit. For example, a recent advertisement for an industrial electrician stated that, among other things,

“Applicants must possess the following attributes: Current Queensland electrical licence; the ability to work unsupervised; exceptional fault finding and problem solving skills; excellent computer skills; and, must be willing to work shift work.”¹⁰

This example is one of thousands that can be obtained from looking at any sizeable employment site. Clearly, while a suitable qualification is necessary in applying for many jobs, it is not sufficient. The candidate needs additional skills (eg, problem solving and computer) and particular personal qualities (ability to work unsupervised and willingness to work shift work). Even entry-level jobs often specify additional skills and personal qualities, beyond the basic vocational skills. A second example is provided by two job ads taken from the Commonwealth employment site (www.jobsearch.gov.au).

¹⁰ Taken from the Gold Coast Bulletin, September 2005.

- Candidates are being sought for the position of Apprentice Fitter/Turner Machinist/Welder (GT) with a leading Engineering Firm in the North Western suburbs - to commence in January 2005. Applicants will be juniors and must have a genuine interest in the trade and will be required to complete an aptitude test. Candidates will also need to have, good presentation, be able to use their initiative, have a high level of accuracy and an eye for detail, good numeracy and literacy skills, and be willing to undertake a minimum of a 4 year apprenticeship. The successful applicant will be working with lathes, mills, gear cutting, CNC and completing general jobbing work in the manufacture of products.
- An opportunity has arisen for a qualified automotive technician to join our Service Department. The applicant must be self-motivated, enthusiastic, versatile and willing to work overtime. Toyota experience including 4WDs is preferred but not essential. We offer excellent conditions, modern equipment, job security and fully laundered uniforms.

Even the *apprentice* Fitter/Turner is expected to have more than the basic aptitudes. He or she must also be genuinely interested in the trade, have good presentation, initiative, literacy, eye for detail etc. The automotive technician is required to be enthusiastic, versatile and willing to work overtime.

These examples illustrate the conceptual and critical point that having a vocational qualification of the required sort is not sufficient to make a person appealing to an employer. It also explains, in part, why a VET qualified person may not be able to find a job that uses her or his qualifications, even in a reasonably tight labour market. In circumstances where there is sizeable un- or under-employment, employers are able to be more particular in their hiring decisions, and overlook applicants that have the technical but not the other attributes that they desire.

Typically, more skilled people can usually find work ahead of less skilled people (assuming that the former can generally do the latter's work, but not vice versa). However, there are many cases when the more skilled do obtain jobs that do not make use of their formal qualifications. As Table 9 shows, in 2001 there were, for example, 18,000 people with university degrees working in elementary sales jobs and about 70,000 people with vocational qualifications working in each of truck or train driving and labouring jobs. In total, 11 per cent of workers with skilled vocational qualifications were working in the particular occupations listed, none of which required their level of skills.

In summary, the endemic complexity of the labour market and heterogeneity of those that participate in the labour market means that some mismatch between workers' skill endowment and the skills their jobs require is to be expected.

Table 9: Selected occupations by selected qualifications, 2001 ('000)

Occupation	Bachelor degree	U/grad or associate diploma	Skilled vocational
Road and rail transport	6.4	9.3	70.5
Elementary clerical	9.5	13.2	7.3
Elementary sales	18.0	15.8	56.5
Elementary service	5.1	9.9	17.5
Cleaner	7.0	13.8	20.7
Factory worker	3.0	11.6	34.2
Labourer	10.0	15.1	71.7

Source: ABS Survey of Income and Housing, 2001 unit record file, authors' calculations.

4.1 Vocational Qualifications and Labour Force Characteristics

4.1.1 Measuring job-skill mismatch

We use an objective technique to measure job-skill match. The ABS ranks occupations in terms of the skill levels required, in particular the formal education or training that is required, using the Australian Qualifications Framework (AQF)¹¹. These job-qualification categories are displayed in Table 10. For example, Associate Professionals are classified as skill level 2, requiring an AQF Diploma or Advanced Diploma. Intermediate Production and Transport Workers are classified as skill level 4, requiring an AQF Certificate II (or one year's relevant experience).¹²

Table 10: Occupations at lower skill level than the nominated VET qualifications

Diploma	Cert III/IV	Cert I/II	Trade
Trade (3)			
Advanced clerical and service (3)	Intermediate clerical and service (4)	Elementary clerical, sales and service (5)	Intermediate clerical and service (4)
Intermediate clerical and service (4)	Intermediate production and transport (4)	Labourers and related (5)	Intermediate production and transport (4)
Intermediate production and transport (4)	Elementary clerical, sales and service (5)		Elementary clerical, sales and service (5)
Elementary clerical, sales and service (5)	Labourers and related (5)		Labourers and related (5)
Labourers and related (5)			

Note: The figures in brackets are the ABS skill level rankings.

¹¹ This method of measuring job-skill mismatch is similar to Definition A – based on job level of the US Dept of Labor Dictionary of Occupational Titles (DOT) classification cited in the literature review (refer footnote 3 in section 2).

¹² See ABS, Australian Standard Classification of Occupations (ASCO) Second Edition: The conceptual basis of ASCO, 1997.

Using this technique we define a person to be working below their skill level if that person is working in an occupation in which their qualification level is not deemed (by the ABS) as necessary for that level of occupation. For example, if a person has a Diploma or Advanced Diploma and is working in an occupation that is lower than Associate Professional, then we deem them to be working below their skill level. Similarly if a person has a trade qualification but is working in an Intermediate Production or Transport job, then they are deemed to be working below their skill level. This is not a precise measure of under-utilization of skills, because of the aggregated nature of the occupational categories. It would be preferable to use much more detailed occupational groups. We were not able to do this more detailed work in the scope of this project, or with the data that were available. Using these criteria, we determine for each person in the sample whether they are working in a job that at least matches their formal qualification (match skills) or is below their formal qualification (below skill).

4.1.2 Descriptive analysis: Main features of the VET qualified workforce

Our analyses begins by describing some of the main features of the workforce aged 20-65 years, who have as their highest qualification a Diploma, Advanced Diploma, or a Certificate III/IV. We exclude from our analyses those who have as their highest qualification a Certificate I/II, because it is very difficult to identify which of these people are working in jobs that are less skilled than these basic qualifications.

To perform these descriptive analyses, we use two main data sources, the ABS Survey of Education and Work, Australia (2003)¹³ and the Household Income and Labour Dynamics (HILDA) survey. The HILDA survey is conducted by the Melbourne Institute of Economic and Social Research on behalf of the Commonwealth Department of Family and Community Services and Indigenous Affairs. We use the first wave of the HILDA data (2001) because it has the largest number of relevant variables. We note, however, that the national unemployment rate was higher in 2001 than it is in 2006, and this is likely to increase the influence of the 'over-education' forces, relative to the present.

Key descriptive findings: VET qualifications

Table 11 shows that, for people in the working ages of 20-65, only 58 per cent of those with Diplomas and 71 per cent of those with Certificate III/IV are in fulltime employment. There is a strong gender dimension to both type of qualification and labour force status. Fifty five per cent of people with Diplomas are women, fewer than half of whom are employed fulltime. More than one in five of these women are not in the labour force. In contrast, three times as many men as women have a Certificate III/IV as their highest qualification. It is well known that very few women undertake trades qualifications, outside of Hairdressing. A high 82 per cent of men with Certificate III/IV are employed fulltime, in sharp contrast with the 39 per cent of women. The different relationship that women have with paid employment, compared with men, is undoubtedly part of the story behind under-utilization of vocational qualifications.

¹³ ABS Confidentialised Unit Record Files (CURF) data: Survey of Education and Work, Australia (2003, cat. no. 6227.0).

Table 11: Labour force status: by Gender (aged 20-65 years).

		Female	Male	Total
		%	%	%
People with Adv.Dip/Dip qualification	Employed full-time	43.1	75.5	57.7
	Employed part-time	30.7	10.3	21.6
	Unemployed	3.6	3.3	3.5
	Not in the labour force	22.5	10.9	17.3
	Total number	527997	430446	958443
People with Cert. III/IV qualification	Employed full-time	39.2	81.6	70.6
	Employed part-time	33.2	6.2	13.2
	Unemployed	4.5	3.1	3.5
	Not in the labour force	23.1	9.1	12.7
	Total	509231	1453438	1962669

Source: Derived from ABS Survey of Education and Work, CURF, 2003.

Table 12: Distribution of people with Adv.Dip/Dip, by gender, contract type, weekly worked hours, English level, by main field of qualification

		In good job		Lower skilled job		Total	
		Persons	%	Persons	%	Persons	%
Gender	Female	188098	47.9	204497	52.1	392596	100.0
	Male	239373	64.5	131588	35.5	370961	100.0
	Total	427471	56.0	336085	44.0	763556	100.0
Working hours	<35 hours	118820	45.0	145442	55.0	264262	100.0
	35-40 hours	116841	54.4	98097	45.6	214938	100.0
	>40 hours	174343	69.1	78008	30.9	252351	100.0
	Total	410004	56.0	321547	44.0	731552	100.0
Country of birth	English-speaking	369301	57.9	268843	42.1	638144	100.0
	Other countries	58171	46.4	67242	53.6	125413	100.0
	Total	427471	56.0	336085	44.0	763556	100.0
Main field of highest non-school	Natural and physical sciences	12834	70.3	5409	29.7	18244	100.0
	Information technology	23239	56.5	17859	43.5	41098	100.0
	Engineering and related technologies	56991	58.9	39846	41.1	96836	100.0
	Architecture and building	9460	60.1	6269	39.9	15728	100.0
	Agriculture, environment and related studies	9721	39.9	14615	60.1	24336	100.0
	Health	68838	70.9	28195	29.1	97033	100.0
	Education	52891	72.4	20120	27.6	73011	100.0
	Management and commerce	114018	50.6	111346	49.4	225365	100.0
	Society and culture	36919	43.9	47197	56.1	84116	100.0
	Creative arts	29807	56.8	22673	43.2	52480	100.0
	Food, hospitality and personal services	8396	29.2	20347	70.8	28743	100.0
	Mixed field programmers/Field not	4358	66.4	2210	33.6	6568	100.0
	Total	427471	56.0	336085	44.0	763556	100.0
ANZSIC 1-digit industry group	Agriculture Forestry and Fishing	10646	58.0	7710	42.0	18356	100.0
	Mining	2112	70.6	881	29.4	2992	100.0
	Manufacturing	27640	44.5	34452	55.5	62092	100.0
	Electricity, Gas and Water Supply	5002	67.6	2393	32.4	7395	100.0

	In good job		Lower skilled job		Total	
	Persons	%	Persons	%	Persons	%
Construction	11941	37.3	20046	62.7	31988	100.0
Wholesale Trade	17910	44.4	22426	55.6	40336	100.0
Retail Trade	23815	32.1	50435	67.9	74250	100.0
Accommodation, Cafes and Restaurants	13286	44.1	16824	55.9	30110	100.0
Transport and Storage	12546	37.9	20522	62.1	33068	100.0
Communication Services	6853	44.6	8530	55.4	15383	100.0
Finance and Insurance	21780	55.7	17298	44.3	39078	100.0
Property and Business Services	74776	68.7	34004	31.3	108780	100.0
Government Administration and Defence	29518	61.2	18695	38.8	48213	100.0
Education	58888	80.4	14313	19.6	73201	100.0
Health and Community Services	75453	66.3	38431	33.7	113884	100.0
Cultural and Recreational Services	9223	46.1	10763	53.9	19985	100.0
Personal and other services	26083	58.7	18362	41.3	44445	100.0
Total	427471	56.0	336085	44.0	763556	100.0

Source: Derived from ABS Survey of Education and Work, CURF, 2003

Table 12 shows a range of characteristics of people who have a Diploma or Advanced Diploma, distinguishing those who are in occupations equal or superior to their qualification, from those in occupations that require lesser skills than their qualification.

Men are more likely than women to be in a job that matches their skills—which is to be expected given the information we have just discussed from the previous table. The gender theme continues when we see that people who work long hours (more than 40 per week) are also more likely to be using their skills. We know that men are much more likely than women to work these long hours.

People born in non-English speaking countries are also less likely to be using their skills.

People with Diplomas in the fields of Health and Education are very likely to be in jobs that are commensurate with their qualification. People with qualifications in Management and Commerce, Food and Hospitality and Society and Culture, are not. The industry sectors of Property and Business Services, Education and Health and Community Services make good use of people's Diploma qualifications, whereas Retail Trade (in particular), Wholesale trade, Manufacturing, Construction, Accommodation, Cafes and Transport and Communications do not.

Table 13 gives the same information for people with Certificate III/IV.

Table 13: Distribution of people with Cert. III/IV, by gender, contract type, weekly worked hours, English level, main field of qualification, industry

		In good job		Lower skilled job		Total	
		Persons	%	Persons	%	Persons	%
Gender	Female	169953	44.7	210613	55.3	380566	100.0
	Male	947312	73.6	340037	26.4	1287349	100.0
	Total	1117265	67.0	550650	33.0	1667915	100.0
Working hours	<35 hours	218956	51.9	203029	48.1	421986	100.0
	35-40 hours	331197	68.5	152159	31.5	483357	100.0
	>40 hours	510613	75.5	166143	24.5	676757	100.0
	Total	1060767	67.0	521332	33.0	1582099	100.0
Country of birth	English-speaking	1010639	67.3	490211	32.7	1500851	100.0
	Other countries	106625	63.8	60439	36.2	167064	100.0
	Total	1117265	67.0	550650	33.0	1667915	100.0
Main field of highest non-tertiary qualification	Natural and physical sciences	1625	78.6	443	21.4	2068	100.0
	Information technology	10490	55.1	8553	44.9	19043	100.0
	Engineering and related technologies	576419	73.9	203612	26.1	780031	100.0
	Architecture and building	222127	80.8	52940	19.2	275067	100.0
	Agriculture, environment and related studies	25413	58.2	18224	41.8	43638	100.0
	Health	34253	53.0	30387	47.0	64640	100.0
	Education	6641	50.4	6546	49.6	13187	100.0
	Management and commerce	82255	49.7	83102	50.3	165357	100.0
	Society and culture	16186	21.8	58227	78.2	74413	100.0
	Creative arts	12387	51.4	11731	48.6	24118	100.0
	Food, hospitality and personal services	126450	62.7	75343	37.3	201793	100.0
	Mixed field programmers/Field not determined	3020	66.2	1541	33.8	4561	100.0
	Total	1117265	67.0	550650	33.0	1667915	100.0

		In good job		Lower skilled job		Total	
		Persons	%	Persons	%	Persons	%
ANZSIC 1-digit industry group	Agriculture Forestry and Fishing	27780	63.1	16213	36.9	43993	100.0
	Mining	19912	65.8	10328	34.2	30240	100.0
	Manufacturing	222100	75.1	73751	24.9	295851	100.0
	Electricity, Gas and Water Supply	23132	85.8	3816	14.2	26948	100.0
	Construction	272654	85.7	45572	14.3	318226	100.0
	Wholesale Trade	47604	56.3	36973	43.7	84577	100.0
	Retail Trade	155576	68.8	70650	31.2	226226	100.0
	Accommodation, Cafes and Restaurants	40295	61.5	25174	38.5	65469	100.0
	Transport and Storage	26404	30.7	59733	69.3	86137	100.0
	Communication Services	19423	63.7	11090	36.3	30512	100.0
	Finance and Insurance	10139	60.2	6704	39.8	16843	100.0
	Property and Business Services	84406	64.9	45623	35.1	130029	100.0
	Government Administration and Defence	24940	53.7	21492	46.3	46432	100.0
	Education	20189	48.6	21333	51.4	41521	100.0
	Health and Community Services	41428	36.3	72740	63.7	114168	100.0
	Cultural and Recreational Services	16210	67.8	7699	32.2	23909	100.0
	Personal and other services	65073	74.9	21759	25.1	86832	100.0
	Total	1117265	67.0	550650	33.0	1667915	100.0

The picture is broadly the same as for those with Diplomas, although the overall size of the problem is less for those with Certificate III/IV, with only 33 per cent working below their skill compared with 44 per cent for those with Diplomas. There is a stronger gender difference, with men being much more likely than women to use their Certificate, as are those who work more than 40 hours per week. The effect of being born in a non-English speaking country, however, is less powerful than for people with Diplomas. People who qualified in the fields of Engineering and Architecture and Building were very likely to be in jobs commensurate with their qualification level, whereas those who qualified in Society and Culture, in particular, but also in Management and Commerce, Education, Health, or Creative Arts had the opposite experience.

In contrast to Diplomas, Manufacturing, Utilities and Construction industries made good use of people's certificate qualifications. Transport, however, seems to something of a refuge or industry of last resort for people with either form of VET qualification, since the jobs that people do in Transport frequently do not use their qualifications. In sharp contrast to Diplomas, Health and Community Services, and Education, do not use the Certificate skills present in their workforces very much.

Key descriptive findings: Trade qualifications

So far we have been dealing with a rather heterogeneous collection of VET qualifications. For example, there are hundreds of different Certificate III/IV courses, covering many different fields. There are also substantial differences between the levels of skill acquired in a four-year apprenticeship, compared with a 6 month Certificate III course. In the current environment, there is a particular interest in the trades, partly because of a sense that some serious shortages are occurring in, for example, the electrical trades, and partly because it takes many years to train more tradespeople. For these reasons, we have repeated our analysis of the factors associated with being employed in a job that is not commensurate with your skills, but looking only at those with Trade qualifications. In order to do so, we needed to use a different data set. The only suitable one that was reasonably contemporary is the Household Income and Labour Dynamics (HILDA) survey. This survey has a smaller sample size (about 12,000 people) than ABS surveys. But it has two major advantages. One is that it is genuinely longitudinal, meaning that it follows the same people over time. A more in depth analysis of the topic of this report than we are able to provide here would use this feature. The second is that we can identify people who a) have a Trade qualification and b) work in a trade job. We also have a different set of information about the respondents than is provided in the ABS data.

Table 14 describes for the Trades the same information that was given earlier for the broader set of VET qualifications.

Table 14: Distribution of tradespersons, by gender, contract type, working hours, English level, industry.

		In good job		Lower skilled job		Total	
Gender	Female	Persons	%	Persons	%	Persons	%
	Male	91862	48.7	96772	51.3	188634	100.0
	Total	1001561	68.1	468157	31.9	1469718	100.0
Contract type	Fixed term	65818	74.7	22339	25.3	88157	100.0
	Casual	71287	47.6	78568	52.4	149855	100.0
	Permanent/on going	530987	65.0	285629	35.0	816616	100.0
Working hours	Total	668092	63.3	386536	36.7	1054628	100.0
	<35 hours	95085	48.9	99487	51.1	194572	100.0
	35-40 hours	145008	62.9	85436	37.1	230444	100.0
English level	>40 hours	761467	73.0	282320	27.0	1043787	100.0
	Total	1001560	68.2	467243	31.8	1468803	100.0
	Bad/not at all	42001	60.5	27476	39.5	69477	100.0
ANZSIC 1-digit	Good	959560	68.5	440680	31.5	1400240	100.0
	Total	1001561	68.1	468156	31.9	1469717	100.0
	Agriculture Forestry and	37522	62.8	22227	37.2	59749	100.0
ANZSIC 2-digit	Mining	35237	69.9	15176	30.1	50413	100.0
	Manufacturing	192846	73.2	70675	26.8	263521	100.0
	Electricity, Gas and Water	17515	69.3	7753	30.7	25268	100.0
	Construction	264289	82.7	55345	17.3	319634	100.0
	Wholesale Trade	25185	46.2	29306	53.8	54491	100.0
	Retail Trade	127288	68.2	59250	31.8	186538	100.0
	Accommodation, Cafes	40324	65.0	21681	35.0	62005	100.0
	Transport and Storage	25879	29.7	61126	70.3	87005	100.0
	Communication Services	15205	50.5	14878	49.5	30083	100.0
	Finance and Insurance	2330	27.8	6053	72.2	8383	100.0
	Property and Business	53056	70.6	22141	29.4	75197	100.0
	Government	28788	58.6	20364	41.4	49152	100.0
	Education	26835	75.8	8551	24.2	35386	100.0
	Health and Community	19331	46.2	22490	53.8	41821	100.0
	Cultural and Recreational	21345	77.9	6068	22.1	27413	100.0
	Personal and other services	65715	76.6	20050	23.4	85765	100.0
	Total	998690	68.3	463134	31.7	1461824	100.0

Source: derived by the authors from the Household Income and Labour Dynamics Survey, wave 1. The numbers are weighted to the population.

Of trade qualified people aged 20-65, 15 per cent of men and 33 per cent of women were not in the labour force. Only 34 per cent of these women, and 75 per cent of the men were employed fulltime. We can see from the table that 68 per cent of all the employed persons with trade qualifications worked in a job that was equal to or more skilled than a trade job. This meant that 468,156 trade-qualified workers were working in occupations with lower skill levels. Note that only 13 per cent of trade qualified employed are female, and these women are much more likely than the men to be working in jobs that do not use their trade skills. Women comprised 21 per cent of those who were working below their skill level, and 9 per cent of those who were using their skills.

The table also shows that, as with our earlier table, people were most likely to be using their skills if they worked more than 40 hours per week: part-time tradespeople had a high rate of skills under-utilization, as did people employed on casual terms. Manufacturing and Construction made good use of their tradespeople's skills, whereas Transport and Storage and Wholesale Trade did not. The largest number of tradespeople who were not using their skills were employed in Manufacturing and Transport. These patterns are similar to the ones that we saw for Certificate III/IV, using the ABS data.

4.1.3 Regression Analysis: Predictors of Imperfect Job-VET Skill Matching

An examination of basic descriptive statistics presented above highlights a number of factors that appear to be related to job-VET skill mismatch. This section looks at these factors and those identified in the literature review in more detail using regression analysis.

In this analysis, we identify those factors that are meaningfully and systematically associated with the likelihood that a worker is employed in a job that is inferior to their highest qualification, holding constant other factors that might have an influence. As we saw in our descriptive analysis with the issue of gender, there can be a number of factors having a simultaneous effect. For example, is it gender, or is it working part-time, or is it both, that leads to the link between working lower hours and increased probability of not using your VET qualification? Regression analysis techniques can help us disentangle these multiple influences.

The ABS Survey of Education and Work records the highest level of VET qualification as (1) Diploma, (2) Certificate III/IV, (3) Certificate I/II. We would have preferred a more detailed disaggregation, for example one that separates out trade qualifications. We are also limited in the degree of detail that we can use about the occupation of workers. These are classified according to the 1 digit ASCO code, which aggregates occupations into 9 groups. These 9 levels are constructed to reflect increasing levels of skill, and in this sense they are suitable for our analysis.

We then use logistic regression techniques to identify the characteristics that are associated with being in a below skill job. The dependent variable is whether a person is employed in a job that requires lower skill levels than their VET qualification, as discussed above. We confine our analysis to people who are employees at the time of the survey (2001). We conduct the analysis separately for men and for women, and for each of the main Australian Qualification Framework

VET groupings, and for the Trades. We are restricted in the choice of the explanatory variables by the limitations of the data set. We have selected, from the information that is available, the characteristics of workers and their jobs that the literature suggests are likely to have some impact on use of skills.

The results of our analysis are presented in Table 15. Men with a **diploma or advanced diploma** are systematically more likely to be working in jobs below their skill level if they are:

- Employed in Manufacturing, Construction, Wholesale or Retail Trade, Transport or Storage, Communication (compared with Personal Services), with the biggest effect occurring for those employed in Transport and Storage, or Retail
- Younger
- Single
- Working less than 41 hours per week
- Migrants from a non-English speaking country
- Employed part-time
- Have their diploma in the fields of agriculture or environment (a very strong effect) or society and culture.

The picture for women is very similar, except that:

- Employment in Cultural and Recreational Services or Finance (rather than Communication) increases their risk
- Marital status and country of birth have no effect
- Having qualifications in natural and physical sciences reduces their risk, whereas qualifications in hospitality and personal services or management and commerce increases their risk.

Men with a **Certificate III/IV** are systematically more likely to be working in jobs below their skill level if they are:

- Employed in Transport and Storage or Health and Community Services (compared with Personal Services)
- Employed part-time
- Have qualifications in information technology, agriculture or the environment, management or commerce, hospitality or personal services, and especially in society and culture.

Women with a **Certificate III/IV** are systematically more likely to be working in jobs below their skill level if they are:

- Employed in any industry other than Personal Services or Agriculture, but particularly if they are in Mining, Wholesale or Retail Trade or Transport and Storage.
- Younger (but the effect declines with age)
- Work 35-40 hours (compared with 41+ hours)
- Employed part-time
- Have qualifications in society and culture.

Table 15: Males and Females with Qualifications

	Advanced Diploma or Diploma		Certificate 1 or Certificate 2		Certificate 3 or Certificate 4	
	Males	Females	Males	Females	Males	Females
	Odds ratio	Odds ratio	Odds ratio	Odds ratio	Odds ratio	Odds ratio
Independent statistically significant independent variables						
Industry						
Agriculture Forestry & Fishing	-0.6	2.4		*2.8	1.1	2.7
Mining	0.0	1.4		-1.0	1.1	*18.8
Manufacturing	*3.3	*3.0		-0.7	*-0.6	*9.9
Electricity, Gas & Water Supply	1.3	1.7		-0.8	*-0.3	1090.4
Construction	*3.3	*9.8		-0.4	*-0.3	*3.8
Wholesale Trade	*2.4	*3.9		-0.7	1.5	*13.9
Retail Trade	*4.1	*3.3		*5.8	*-0.5	*13.4
Accommodation, Cafes & Restaurants	1.8	1.3		1.2	*-0.3	*8.7
Transport & Storage	*4.3	*3.2		-0.7	*5.1	*16.0
Communication Services	*3.4	1.1		*9.7	1.1	*9.6
Finance & Insurance	1.2	*2.6		0.0	-0.3	*7.6
Property and Business Services	*-0.4	1.4		-0.6	-0.7	*4.5
Government Administration & Defense	-0.9	1.4		-0.5	1.0	*13.3
Education	*-0.2	-0.6		*-0.2	-0.8	*8.7
Health & Community Services	-0.9	1.1		*-0.4	*2.1	*10.6
Cultural & Recreational Services	2.1	*3.0		-0.5	*-0.4	*8.7
Age						
age	*-1.0	*-1.0	*-1.0			*-0.9
age ²						*1.0
Marital status						
Not married		*1.8		*1.9	*1.6	
Working hours						
<35 hours		*1.6	*2.2			1.6
35-40 hours		*1.8	*1.9			*2.1
Country of birth						
English-speaking			*-0.5			
Labour force status full-time or part-time						
Employed full-time workers	*-0.3	*-0.6	*-0.3	*-0.5	*-0.3	*-0.6
Main field of highest non-school qualification						
Natural & physical sciences	2.0	*-0.8		-0.6	1.5	0.0
Information technology	1.6	2.2		-0.4	*2.3	2.0
Engineering & related technologies	2.4	2.4		1.0	1.5	3.1
Architecture & building	1.9	1.7		0.0	1.6	1.3
Agriculture, environment & related studies	*9.5	*4.1		-0.3	*2.4	1.5
Health	1.6	-0.8		*-0.1	-0.9	-0.8
Education	3.2	1.2		-0.2	1.2	2.2
Management and commerce	2.0	*2.7		*-0.2	*2.7	1.3
Society and culture	*2.8	*2.7		-0.5	*7.0	*3.8
Creative arts	1.5	1.0		-0.8	1.5	2.4
Food, hospitality & personal services	2.2	*4.1		-0.5	*2.3	1.2
Number of cases included in the model	N=1140	N= 1255	N=640	N=1060	N=4015	N=1232
Pseudo R ² =	0.244	0.172	0.351	0.434	0.266	0.165

This analysis is not able to distinguish what is cause and what is effect. That is, people with a Diploma who work in Retail may be less likely to have a job that is commensurate with their skills because Retail is a relatively low-skilled industry. Or people with a Diploma may be employed in Retail because they cannot find a job elsewhere that makes use of their skills. A true understanding of cause and effect cannot be achieved with the data that we have. But the regressions nonetheless provide a useful description of the factors that are associated with people being employed in jobs that are below their qualification level.

Even among the vocational qualifications, some are less directly vocational than others. This probably accounts for part of the reason why qualifications in Society and Culture and Agriculture and Environment are less frequently used. It is also likely that these qualifications are sought partly because of the attraction of the knowledge, rather than just because the student anticipates being able quickly to find a job that uses their new skills.

Younger people are consistently less likely to be using their qualification than are older people. This suggests that it takes time to find a good job match (a well-known finding in the job search literature) and younger people have a higher proportion among them that have not yet done so.

For men, but not for women, being single increases the likelihood of working below your qualification level. One interpretation of this is that (some) men have personal qualities that make them relatively unattractive as employees, and these same qualities make them relatively unattractive as marriage partners (not helped by the difficulty that they find in getting a good job).

Working part-time is systematically associated with having a job below your skill level. This probably reflects the fact that many factors, not just getting the highest possible wage, are at work when people accept a part-time job. For the many women with family responsibilities who are content to work part-time, the job is only a modest part of their life focus. It is thus less urgent for them to find a good fit with their skills. In addition, they tend to be more confined to the local labour market, not wanting a long commute (which is less justified in any case for less than a full day's work). People are also unlikely to move house in order to take a part-time job, even if it is the only way to find a job that uses their skills. In sum, when a person works part-time (and perhaps even when they work as a casual), the payoff to them the payoff to them of taking the steps necessary to find a good fit between their skills and their job is smaller than is the case for a person who works longer hours and in a job that is expected to continue.

It is interesting to note that being born in a non-English speaking country had little impact on the probability of under-utilization of skills. This is a crude measure of English language competence, since it does not distinguish people who have recently migrated from those who have been in Australia a long time. We expect (based on the findings of the migration literature) that more recent migrants from non-English speaking countries would have some difficulty in obtaining jobs that are commensurate with their qualifications.

We repeated this analysis, using the HILDA data, to look just at the experience of people with trade qualifications. The factors that were significantly associated with

an increased likelihood of being in an occupation with below trade skill requirements were:

- Being single
- Having fewer years of paid employment
- Being in your current job for a shorter period of time
- Working less than 41 hours per week, especially if working part-time
- Being employed in Transport and Storage (being employed in Manufacturing, Construction, Accommodation and Cafes, Property and Business Services and Education all slightly, but significantly, increased your chances of having a job that was commensurate with your skills).

The experience of Tradespeople reinforces the earlier conclusions that being single, working less than 41 hours per week and being employed in the transport sector all mean you are less likely to be using your VET skills. However, some of the industries that do not seem to make good use of the broader Certificate III/IV, do offer suitable jobs to people with trades qualifications. Examples are Accommodation and Cafes, and Property and Business Services.

We also conducted a multiple regression analysis to examine the strength of various factors in explaining a different measure of job-skill match. This analysis used wave 4 (2004) HILDA data. In contrast to the ABS data, the HILDA data allows us to subjectively measure job-skill match using workers' self assessments. In the HILDA survey respondents were asked to rate their agreement on a scale from 1 (strongly disagree) to 7 (strongly agree) to the following statement, "I use many of my skills and abilities in my current job". For the purposes of this report, the scale was reinterpreted to indicate perceived job-skill match, such that 1=job-skill mismatch through to 7=job-skill match. This measure of job-skill match probably embraces a broader definition of skill than the objective measure that we have used up until now, that equates skill with formal education and training.

We used this rating of job-skill match as the dependent variable in a multiple regression with 11 explanatory variables. The overall explanatory power of the regression was low, so we do not give a detailed table of results. But a particularly interesting finding, which we could not investigate in the previous analyses, was that self-reported health status had a significant effect on the extent to which people felt that they used many of their skills in their job. Specifically, the worse your health, the less you felt that you used your skills in your job. The analysis also found that people who had more years of experience in their current occupation were more likely to use their skills in their job.

5. Conclusion

In a dynamic economy that is subject to structural change, there will never be a precise match between the skills that workers have and the skill requirements of jobs. Furthermore, the skill requirements of a job often extend well beyond the knowledge learned in obtaining a formal qualification. Hence, the term 'skill' should ideally be conceived as encompassing formal qualifications as well as other supplementary skills derived from on-the-job training, and including cognitive abilities, personal traits, etc. It is also costly for both workers and firms to search for the perfect match

between worker capabilities and interests, and firm requirements. These costs include the economic and social costs of moving or commuting to where the good job is. Thus workers are willing to accept jobs that do not use all their skills, or which they do not like in other ways, in order to avoid having to continue their search for the best job. This is particularly true for people who work short hours. And employers are willing to hire people who do not have the combination of attributes that they really want, for the same reason and especially if the job is expected to be short term.

All these normal characteristics of a labour market provide part of the explanation as to why some people are employed in jobs that are inferior to their skills / qualifications.

Our analysis has provided some more particular reasons.

First, structural change in the economy has moved employment away from VET dominated occupations (especially the trades), and towards occupations that require higher education (professions, associate professions and managers and administrators). This will increase the likelihood that VET-qualified workers will have to look for lower level jobs.

Second, the growth in the proportion of the workforce that has higher education (bachelor degree or above), relative to VET qualifications, will intensify the competition for jobs where both types of qualification are found (especially associate professionals and advanced or intermediate clerical and service jobs). This can be explained in part as 'over-education', leading to 'bumping down' of those with VET qualifications. It can also be understood in terms of the impact of computer-based technologies on the qualities that employers need, with a movement away from teachable practical skills towards higher level problem-solving and inter-personal skills.

Third, the increased share of women in paid employment is likely to have reduced the quality of the skill match. The reasons are that women are much less likely than men to be employed fulltime (and especially, to work more than 40 hours per week), and be on a continuing employment contract. Both these features reduce the payoff to long search for a job that has a good match between the worker and the firm. Women are also less likely to be geographically mobile and to be willing to incur long commuting times to find a good job match.

Fourth, the secular shift towards less secure employment and to a division between long and short hours of work (at the expense of the 'normal' 35-40 hours job) will probably reduce the quality of the job match for men as well as for women. Our regression results show that casual workers were more likely than permanent workers to have a job-skill mismatch, as were part-time workers.

Fifth, some industries have a particularly poor record of making use of the skills / qualifications of their workers (for example, Transport and Storage). It may be that when a VET-qualified person cannot find a job that uses their skills, they find one that does not, and the jobs they can get have been particularly in transport and in the fast growing areas of retail and wholesale. We suspect that this is the correct way to interpret the strong links between some industries and high levels of skill mismatch.

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