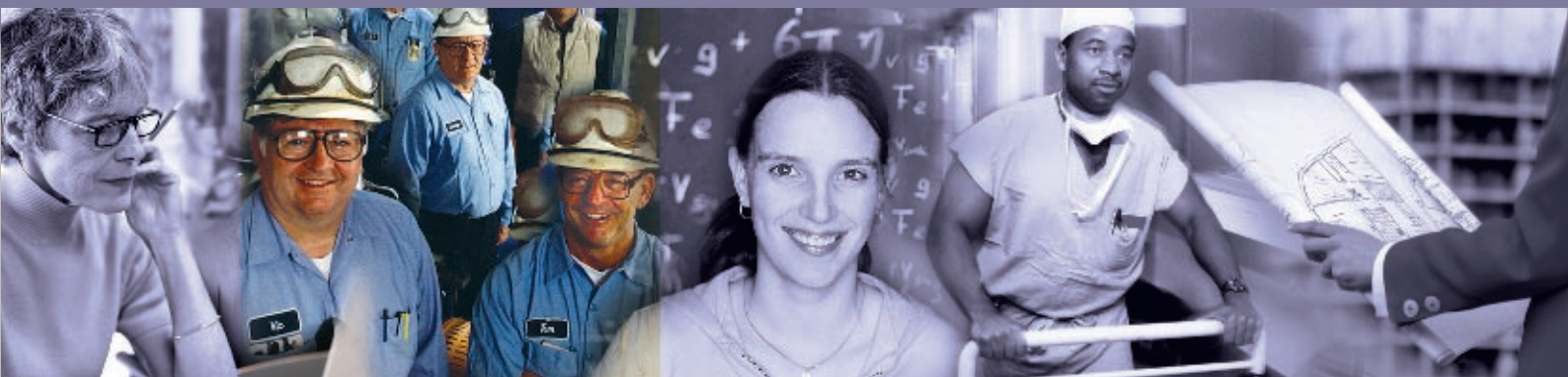


What is a skill shortage?

Sue Richardson

National Institute of Labour Studies,
Flinders University



Program 2:
The nature of the labour supply



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The views and opinions expressed in this document are those of the author/project team and do not necessarily reflect the views of the Australian Government, state and territory governments or NCVER

Publisher's note

To find other material of interest, search VOCED (the UNESCO/NCVER international database <<http://www.voced.edu.au>>) using the following keywords: skill shortages; supply; demand.

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Foreword

This research was undertaken under the National Vocational Education and Training Research and Evaluation program, a national research program managed by the National Centre for Vocational Education Research (NCVER) and funded by the Department of Education, Science and Training on behalf of the Australian Government and state and territory governments.

In 2004 NCVER invited proposals from a consortia of researchers to address questions relating to changing work skill needs and work organisation arrangements and their implications for the vocational education and training sector. The National Institute of Labour Studies, Flinders University, and the Centre for Post-compulsory Education and Lifelong Learning, University of Melbourne, were selected to undertake a body of work in the following areas¹:

- ✧ the nature of future labour demand, with a focus on the demand for vocational skills
- ✧ the nature of future labour supply, including changing demographics, work patterns and educational levels
- ✧ the changing nature of work organisation, including the mix between full-time, part-time and casual, and the way work is organised and performed in the workforce
- ✧ the participation in vocational education and training (VET) by existing and new workers
- ✧ the VET sector's current and adaptive capacity, including evaluation of current systems for identifying skill shortages and under-represented groups
- ✧ the future value and effectiveness of VET and how they can be maximised.

This report is a product of the second topic—the nature of the future labour supply. Its purpose is to:

- ✧ set out some clear thinking on the meaning of the term 'skill shortage'
- ✧ identify circumstances under which shortages are resolved naturally by market forces
- ✧ provide a guide for when a shortage warrants action from public-policy interventions to assist the market.

The report does not attempt to quantify any overall or particular shortage of skills. The report is directed at policy-makers, employers, industry bodies and training providers interested in understanding the nature of skill shortages.

Tom Karmel
Managing Director, NCVER

¹ A list of reports resulting from this research consortium can be found in appendix 1.

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Key messages

The vocational education and training (VET) system has an important role to play in assisting with the smooth matching of the skills wanted by employers with the skills offered by workers. This report looks in detail at the meaning of supply of and demand for skills in the Australian labour market, focusing in particular on the way in which skill shortages are identified and addressed.

This report is part of the larger research program, *A Well-skilled Future: Tailoring VET to the Emerging Labour Market*.

- ✧ While the term ‘skill shortage’ seems to be clear and unambiguous, in reality it is a slippery concept with many meanings. For a shortage to occur, it is necessary for the demand for a particular type of worker to exceed the supply of such workers, but the notions of supply and of demand are themselves quite inexact.
- ✧ Employers look for many qualities in a worker, beyond the technical capacity to complete the required tasks. When workers are abundant, employers develop a high expectation of the level and range of qualities that new workers should possess. When workers become scarce, employers are forced to accept workers with lesser qualities (such as relevant experience, personal presentation and willingness to work flexible hours). Employers experience this as a shortage of suitable workers.
- ✧ The normal operation of the labour market, including variations in the wages and conditions of the job, will deal satisfactorily with many types of shortage. But it will not work well if there are few people with the required skills who are not already using them, and it takes a long time to acquire such skills.
- ✧ We suggest the following scheme for classifying skills shortages:
 - ◆ Level 1 shortage
There are few people who have the essential technical skills who are not already using them and there is a long training time to develop the skills.
 - ◆ Level 2 shortage
There are few people who have the essential technical skills who are not already using them but there is a short training time to develop the skills.
 - ◆ Skills mismatch
There are sufficient people who have the essential technical skills who are not already using them, but they are not willing to apply for the vacancies under current conditions.
 - ◆ Quality gap
There are sufficient people with the essential technical skills who are not already using them and who are willing to apply for the vacancies, but they lack some qualities that employers consider are important.
- ✧ There is no simple reliable measure of the existence of a skill shortage. It is necessary to draw on a range of indicators, as is done by the Commonwealth Department of Employment and Workplace Relations. The most important component of these indicators is the time taken to fill vacancies for the skill in question.

Executive summary

This report is a component of the research program entitled *A Well-skilled Future: Tailoring VET to the Emerging Labour Market*, in which the evolving labour market and changing work organisation and management in the context of the vocational education and training (VET) sector are examined. The research has been undertaken by a consortium of researchers from the National Institute of Labour Studies and the Centre for Post-compulsory Education and Lifelong Learning of the University of Melbourne.

A shortage of skills is a source of aggravation to firms and, when acute, it is likely to hamper the quality and quantity of their output. The vocational education and training (VET) system has an important role to play in assisting with the smooth matching of the skills required by employers with the skills offered by workers. A timely response from the VET system with the supply of skills will be assisted by an understanding of how the market operates. The sector will be helped in this understanding if the term ‘shortage’ can be precisely defined and if the circumstances can be identified under which any such shortage is likely to be naturally and efficiently resolved by market forces. Since VET will be a part of any public-policy response, it is important to recognise when direct policy intervention is necessary to assist the market. It is the purpose of this report to set out some clear thinking on each of these issues. I will not attempt to quantify any overall or particular shortage of skills.

Skill shortages can have many causes. These include: a general under-investment in skills development; rapid structural change combined with low levels of overall unemployment; a cyclical surge in employment in a part of the economy; and particular spots of weakness in the training system. In all likelihood, the shortages seen in 2006 are a consequence of all of these. Employers might also find that they are unable to attract the workers they want because the pay and working conditions on offer are unattractive. This will feel like a shortage to the employers concerned, even if the labour force as a whole has an adequate supply of the skills in question.

The idea of a shortage seems straightforward: the supply of workers is not sufficient to meet the demand at current rates of pay. But on closer inspection ‘shortage’ is a surprisingly slippery concept. To quote the United States Bureau of Labor Statistics, ‘... there are no objective measures or direct indicators of skill shortages’.

The supply of workers with a particular skill is difficult to measure for several of the following reasons.

- ✧ What is important is not just the number of *people*, but also the number of *hours* they are willing to work. While some people work long hours, many others work part-time.
- ✧ Within an occupation, there may be specialised sub-sets of skills or locations having difficulty recruiting, while other areas are not.
- ✧ As noted above, vacancies may go unfilled, not because there is no one available who can do the job, but because the wages and conditions on offer are unattractive.
- ✧ Within every skill group, there is a range of ability—from exceptional to ordinary. This variation in quality is important to employers, but not observable in measures of labour supply.
- ✧ Many people work in jobs that do not directly use their formal qualifications; alternatively, they may be of working age but are not seeking employment.

From this we can see that it is possible to increase the supply of a particular skill in a number of ways. These include: increasing the hours worked per worker; increasing the proportion of people who are qualified for an occupation who actually work in the occupation; and increasing the intensity of work and the efficiency with which the scarce skill is used. Increasing the number of people recently trained in the skill (for example, through vocational courses) is only one way to increase supply.

The following scheme for classifying skills shortages is suggested:

- ✧ Level 1 shortage:
 - ◆ There are few people who have the essential technical skills who are not already using them and there is a long training time to develop the skills.
- ✧ Level 2 shortage
 - ◆ There are few people who have the essential technical skills who are not already using them, but there is a short training time to develop the skills.
- ✧ Skills mismatch
 - ◆ There are sufficient people who have the essential technical skills who are not already using them, but they are not willing to apply for the vacancies under current conditions.
- ✧ Quality gap
 - ◆ There are sufficient people with the essential technical skills who are not already using them and who are willing to apply for the vacancies, but they lack some qualities that employers consider are important.

The definitions of shortage need to make an additional distinction. This is between workers who do not have the essential technical skill, on the one hand, and workers who are judged not to have the degree of motivation and other personal characteristics that the employers desire, on the other hand. To illustrate, suppose that Australia has sufficient qualified automotive technicians to fill all the vacancies and they are willing to apply for the available jobs. However, there are not enough who are self-motivated, versatile and willing to work overtime to meet employers' requirements. Is there a shortage? If there is, it is of a form different from the absence of specific skills and less easily within the reach of the VET system to address.

In many cases, but not all, we can reasonably leave it to the labour market to sort out the problem of shortage. There is no fixed quantity of any particular skill *supplied* to the economy, nor is there a fixed quantity *demand*. Rather, supply will rise as the terms of employment become more attractive. And demand will fall as the costs of employing people with particular skills rise. But the market will not work well if *both* supply and demand are unresponsive to wages and other conditions of employment.

The wage is not the only aspect of employment that works to correct a shortage (or a surplus). When a particular occupation moves from a position of surplus workers to a shortfall of workers, then firms will not be able to recruit from an attractive pool of applicants. Instead, they will find that they have to reduce their expectations of the 'quality' (including perhaps the motivation, initiative, experience, presentation etc.) of people they can recruit for the pay and conditions they are offering. This acceptance of a reduced quality will, for a constant-quality worker, be the equivalent of an increase in pay. It will also appear this way to the firm.

Clearly, Level 1 shortages will be the most severe obstacle to the expansion of firms, and it is these which require longer-term planning within the training system. This planning is required to anticipate skills needs as far as this is possible and to ensure that the system has the necessary capacity to provide the required training. Where it takes only a short time to acquire the necessary skills (for example, Certificate III in Aged Care) and many people have the ability to learn these skills, then the normal adaptation mechanisms of the labour market are likely to work quite well to ensure that any shortage does not persist.

A market economy is a dynamic institution. Firms and their jobs are constantly being born, expanding, contracting and dying. Each year about one in five workers ends a job they were in. It is

inconceivable in such an environment that there will be a continuous and precise match between the types of skills that are required and the types of skills that the workforce has to offer. When there are sizeable levels of unemployment, under-employment and non-employment, much of this inevitable imbalance is hidden from the notice of firms. With a few exceptions, employers find that, when they advertise a job, a number of people with the relevant skills apply. They are then able to look for additional qualities, such as precise relevant experience, desirable personal qualities, and evidence of enthusiasm and potential commitment to the firm. From the employers' perspective, the skills system therefore seems to be working quite well. However, the consequences of the imbalance are borne by workers, who cannot find employment that uses the skills they have laboured (and paid) to acquire. As the overall labour market tightens, the structural mismatch between skills and job requirements becomes more apparent to employers. It is then that we start to hear about skills shortages, and the extent of the mismatch becomes an issue of policy concern. These periods of high overall labour demand when skills mismatches come to the surface provide a valuable opportunity to evaluate the total skills development system for its capacity to be responsive to the needs of both employers and workers.

Skills shortages

Introduction

A shortage of skills is a source of aggravation to firms and, when acute, is likely to hamper the quality and quantity of their output. In a market economy, firms are accustomed to being limited by their capacity to find buyers for their products, not by their capacity to produce those products. When firms have buyers waiting, but cannot produce enough to satisfy the demand because they cannot recruit sufficient skilled workers, they interpret this as a failure of the skills development system.

The decline in the overall unemployment rate (at 4.9% in May 2006, it is the lowest for three decades) is causing increasing numbers of firms to bump up against these capacity constraints caused by skills (indeed, labour) shortages. Contemporary surveys of business confidence report that 'the availability of suitably qualified employees has remained the number one constraint on business expansion' (Australian Chamber of Commerce and Industry 2006). But even in times of relatively high unemployment, employers frequently cite skills shortages as one of the business difficulties they face. What is more, they imply that there is a duty for public policy to come to their aid by somehow reducing such shortages.²

The vocational education and training (VET) system has an important role to play in assisting with the smooth matching of the skills wanted by employers with the skills offered by workers. It will be helped in this task if a precise meaning can be assigned to the term 'shortage' and if the circumstances can be identified under which any such shortage is likely to be naturally and efficiently resolved by market forces. Since VET will be a part of any public-policy response, it is important to identify when direct policy intervention is called for to assist the market. It is the purpose of this report to set out some clear thinking on each of these issues. I will not attempt to quantify any overall or particular shortage of skills.

What is a shortage?

The idea of a shortage seems straightforward: the supply of workers is not sufficient to meet the demand at current rates of pay. But on closer inspection 'shortage' is a surprisingly slippery concept, as the following quotes demonstrate:

Labour shortages are not easy to measure. (OECD 2003, p.103)

There is no universally applied definition of labour shortages. (OECD 2003, p.105)

² Examples of reported shortages are abundant. The Department of Employment and Workplace Relations maintains a skills in demand list, which is used in part to guide immigration selection. At present, this list contains most of the trades, most of the health professions and a number of other professional and semi-professional occupations. Employers in the aged care industry report shortages of direct care workers. Shortages of nurses, electricity linesmen, several of the trades, chefs, hairdressers, doctors, building trades and so on are regularly reported in business and other surveys. A recent edition of the Hudson Report (2005) gives the main priorities among 7800 human resource managers surveyed in Australia; 20% of them cited attracting suitable staff as their main human resource priority, while 38% cited staff development and retention (p.3). Business owners, according to the 2005 International Business Owners' Survey, claimed that lack of a skilled workforce is the biggest factor constraining growth (see *The Advertiser* 2005).

... there are no objective measures or direct indicators of skill shortages.

(Alpert & Auyer 2003, p.1)

No single empirical measure of occupational labor shortages exists, nor does it appear that

one can easily be developed. (United States Bureau of Labor Statistics 1999, p.17)

A long-standing definition that appeals to economists is that by Arrow and Capron (1959, p.307). A shortage is 'a situation in which there are unfilled vacancies in positions where salaries are the same as those currently being paid to others of the same type and quality'.

An alternative definition, expressed in terms of supply and demand, is 'a market disequilibrium between supply and demand in which the quantity of workers demanded exceeds the supply available and willing to work at a particular wage and working conditions at a particular place and point in time' (Barnow, Trutko & Lerman 1998, p.7).

Each definition focuses on the shortfall in supply relative to demand, at the prevailing wages and conditions. But the concepts of demand, supply and prevailing conditions are not straightforward.

Let me illustrate the tricky nature of 'shortage' with an example where the concept should be quite clear cut—the case of doctors.

Illustration of a shortage using doctors

The level of supply

A person cannot perform work as a doctor unless she or he has a precisely determined qualification (Bachelor of Medicine/Bachelor of Surgery, or overseas equivalent) and is registered as able to practise. So, unlike many occupations, it is clear what the pool of potential doctors is. What is more, most people of working age (traditionally defined as 15–65 years) who are qualified to work as doctors actually do so. Not all do, however; some become winemakers, some move into health administration, some teach medicine, some stay at home to care for their children, a few even become politicians. It is a reasonable approximation (but not more than that) to say that the supply of doctors is the number of Australian residents of working age who are qualified to work as doctors. But even here there are several complications.

First, the number of people who are able and willing to work as doctors is not the same as the total supply of doctors' services. To get from the first to the second, we need to consider the number of hours per week and per year that each doctor, on average, is willing to work. One of the main reasons for the current feeling that there is a shortage of doctors is that, first female doctors, then male doctors also, have begun to reject the norm of very long hours of work. With no change in the number of *people*, this is reducing the supply of doctors' *services*.³

Second, medicine is divided up into many sub-specialties, such as general practice, anaesthesia, oncology, sports medicine etc. The entry to each of the main specialties is controlled by the existing members of those specialties, through training, examination and registration requirements. In many cases, doctors who would like to become a particular form of specialist are unable to do so because they cannot gain a training place, or they fail the training and examination process. This may lead to what is seen as a shortage—although there are people wanting to gain the required skills who are prevented from doing so. Furthermore, the division into specialties means that there are likely to be shortages in some areas and sufficient doctors in other areas. Another division within medicine exists between private and public practice. A difficulty in recruiting doctors to work in public hospitals does not, for example, necessarily mean that there is shortage of doctors overall. This

³ See, for example, Wainer (2004). Many female doctors work part-time, and the average hours of rural part-time female doctors in the sample was 27, with full-time doctors working on average 53 hours per week.

means we have to have a more nuanced notion of what is in short supply—it may not be all doctors, but rather some particular types of doctors.

Third, medicine is a personal service. It has to be provided via face-to-face contact with the patient (with some exceptions being made possible by new communications technologies). This means that the doctors need to be located where the patients are (or vice versa). It is common to observe that doctors like to practise near where they live and that they like to live in attractive places—the affluent suburbs of big cities, or delightful coastal or country locations. We therefore do not see a shortage of general practitioners on the north shore of Sydney or the leafy east of Melbourne and Adelaide. But we do see shortages in the less inviting suburbs of all the capital cities and in many country areas.

Fourth, medicine is a skill that is in demand right around the world. There is an international labour market in doctors. Some doctors who trained in Australia are employed overseas and vice versa. This international movement of doctors is part of the supply response and needs to be taken into account when assessing whether there is a shortage or not. The international movement of doctors raises the question of quality. In every occupation and skill type there are variations in just how skilful and talented any individual person is. One doctor can be of average ability, another a very good doctor, and yet another, an exceptionally skilled doctor.

What holds true for doctors also holds true for every other skill. The qualifications process certifies (with more or less accuracy) that a person has a minimum level of competence in the nominated field of endeavour. But there is typically a wide range of quality difference between the minimum and the best. In the case of a regulated occupation such as medicine, the stringency of the testing/licensing requirements will also affect supply, especially where that supply comes from overseas. More relaxed requirements will increase the pool of people who are eligible to practise.

Fifth, not all people who are qualified to work as doctors in fact do so. It is convention (supported by pension and superannuation rules) that people retire at around age 65. In fact, many people have been retiring at earlier ages than this. Some retire later. The age at which people retire will affect the supply of doctors' services. So will the manner in which they retire. Retirement has traditionally been seen as a shift from full-time work to zero paid work. In fact it can be less absolute than this, with people shifting to part-time or part-year employment, or taking up some form of less demanding work, or moving in and out of employment. All these options are open to doctors and influence total labour supply.

It is clear from this example that the apparently simple question of identifying the supply of doctors in fact has many dimensions to it. These include: hours worked; the proportion of people qualified for the work who are in fact working in the occupation in question; sub-specialisations within the broad occupational category; quality differences; international worker movements; and the geographical location of people with the required skills. All of these dimensions, and often many others, are also relevant to the full range of skills and occupations. Doctors, in fact, represent one of the more simple cases for understanding supply, because the occupation is clearly defined and most people who are qualified to work in the occupation actually do so. This is not true for many other occupations, including the trades and nurses. Many people who have qualifications, for example, skilled metal tradesmen, actually work in jobs such as the emergency services, truck driving, and security staff.

The level of demand

Supply is one side of the shortage equation. The other side is demand. I will illustrate the issues surrounding the meaning of demand by continuing with the example of doctors.

The quantity of doctors' hours demanded is the sum of the quantity currently employed plus the quantity employers are seeking to recruit. In the case of doctors, the concept of employer is complicated by the fact that many doctors are self-employed. Here the demand comes directly from

the patient. Let us concentrate for the moment on doctors who are employed by hospitals and health services.

Suppose a hospital in a regional city wants to recruit four doctors. In estimating its demand for doctors, it must first be established whether these are to replace doctors who are leaving, or whether they are to expand the total number who are employed. There are parallels on the demand side with the issues that were identified for supply.

As with supply, it is necessary to think in terms of the numbers of hours of doctors' time that are needed, rather than just the number of people. It is also necessary to consider the detail of what skills the hospital wants and the terms it is offering the recruit. Is the hospital wanting generic 'doctors', or is it looking to recruit particular specialties? Does it want doctors who are willing to work on weekends, or would someone who wants a 9-to-5 weekday job be satisfactory? Does the hospital insist that the doctors have several years of experience, or would a recently trained doctor be acceptable? Must the doctor have management and/or leadership skills as well as medical skills? Finally, what terms of employment is the hospital willing to offer? Will it provide good housing? Will it offer attractive rates of pay? Will it provide opportunities for professional development? Does it provide good complementary and support services? Does it provide good childcare?

Increasing aggregate supply

For the system as a whole, the total supply of doctors' hours can increase in several ways. These are:

- ✧ an increase in average hours worked per doctor
- ✧ an increase in the proportion of Australian residents who are qualified to work as doctors, who are actually doing so
- ✧ an increase in the number of newly qualified doctors and net immigration of doctors who are qualified to practise in Australia (including by reducing the stringency of the qualifications assessment)
- ✧ an increase in the proportion of doctors' time that is spent in doing things that only doctors can do
- ✧ an increase in the intensity of work, that is, the amount of medical services provided per hour worked.

Note that extra training—an increase in the supply of recently graduated doctors—is only one of the possible ways to increase supply.

An individual employer can also recruit by attracting doctors who are already employed elsewhere.

While individual employers and locations have trouble retaining and recruiting the doctors they are prepared to pay for, the system as a whole may have a sufficient number of doctors of the right sort of specialisations. This structural imbalance can cause many of the symptoms of shortage. However, a situation such as this should be identified for what it is, a mismatch between the places where doctors are needed and the places where they want to work.

The discussion above is not intended to be a comprehensive account of the complex issue of doctors' shortages. It is provided as a concrete illustration of the many dimensions to the apparently simple concepts of supply and demand and shortage.

How best to understand shortages

We need to have a language that enables us to think clearly and to communicate unambiguously about what we mean when we use the term 'shortage'. As indicated at the start of this report, such a clear and sharp understanding has remained elusive.

In their study of the idea of skills shortages, Shah and Burke (2005) propose a typology that reserves the term 'shortage' for situations where:

The demand for workers for a particular occupation is greater than the supply of workers who are qualified, available and willing to work under existing market conditions.

(Shah & Burke 2005, p.v)

This is very similar to the definition with which we opened the paper and has a long history. These authors add that such a shortage will be signalled by the existence of hard-to-fill vacancies. The Commonwealth Department of Employment and Workplace Relations uses the idea of hard-to-fill vacancies in the construction of its list of occupations in demand. The department also focuses on the proportion of employers who are able to fill vacancies within a specified period.

In principle, hard-to-fill vacancies provide an excellent means of identifying where firms are having difficulty in recruiting to meet their production requirements. In practice, vacancies are difficult to measure and it is even harder to establish whether they are genuinely difficult to fill (or just reflect, for example, poor pay and conditions), and whether failure to fill them will have any serious economic consequences. We emphasise that what is important about vacancies as an indicator of skill shortage is that they are hard to fill. This is signalled by the fact that employers take a long time to fill the vacancy. Thus the key empirical indicator of shortage is the duration of (or time taken to fill) vacancies. The absolute number of vacancies on its own tells us little. A large number, for example, may just indicate that this is an occupation in which it is normal to have a high turnover.

The Department of Employment and Workplace Relations obtains information on vacancies by scrutinising job advertisements in the major metropolitan newspapers and counting vacancies listed on three main internet sites (for information technology jobs). Firms advertising vacancies are contacted to see how long it takes to fill the vacancies. This is a sound procedure, which is followed systematically, but it is still difficult to implement in practice in a way that gives robust results. A recent audit of Department of Employment and Workplace Relations vacancies data by the National Audit Office concluded: '... vacancies are frequently duplicated and dated. At any point in time, around 14% of vacancies are duplicated. Over time, the duplication rate is substantially higher, at over 46% ...' (Auditor General 2006, p.17).

The Department of Employment and Workplace Relations makes the following distinctions when considering the extent and nature of a skill shortage:

Skill shortages exist when employers are *unable to fill or have considerable difficulty in filling vacancies for an occupation*, or specialised skill needs within that occupation, at current levels of remuneration and conditions of employment, and reasonably accessible location.

Skill gaps occur *where existing employees do not have the required qualifications, experience and/or specialised skills* to meet the firm's skill needs for an occupation. Workers may not be adequately trained or qualified to perform tasks, or may not have upskilled to emerging skill requirements.

Recruitment difficulties may be due to *characteristics of the industry, occupation or employer*, such as: relatively low remuneration, poor working conditions, poor image of the industry, unsatisfactory working hours, location hard to commute to, inadequate recruitment or firm-specific and highly-specialised skill needs.

(Department of Employment and Workplace Relations quoted in
Department of Education, Science and Training 2000, p.4)

This is a useful and workable typology, but it still leaves open the problem that definitions of shortage need to distinguish the situation where there really are no people who have the skills (and perhaps credentials) that are a minimum requirement for competence in the job, from a situation where such people do exist, but for some reason they are not applying for the jobs. In the first case, one firm can fill its vacancy only by causing a vacancy elsewhere (that is, by poaching). In the second case, the vacancy can be filled by locating and attracting workers who are not at the time using the skill that is now in short supply. In practice, the observation that there are persistent

vacancies is not enough to enable us to know whether we are observing a skill shortage or a recruitment difficulty as defined by the Department of Employment and Workplace Relations.

The definitions of 'shortage' need to make an additional distinction. This is between workers who do not have the essential technical skill (for example, the capacity to weld, to cook, to write computer code, to maintain high-voltage power lines) and workers who are judged not to have the degree of motivation and personal characteristics that the employer desires. As Green, Machin and Wilkinson (1998) have documented, employers often confuse these capacities when they speak of shortage. This can be illustrated for Australia by a selection of the first few job advertisements taken from the job search website run by the Australian Government (<www.jobsearch.gov.au>). Three such advertisements are quoted below.

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.

The publisher of The Daily Telegraph, Sunday Telegraph and The Australian newspapers have [sic] an opening for an Area Sales Manager. You will be tertiary qualified with a demonstrable record of success. You will use a consultative approach to sales in addition to:

- ✧ Excellent oral and written communication skills
 - ✧ Solid organisational and planning skills
 - ✧ Customer focussed with the ability to liaise at all levels
 - ✧ Possess initiative and be a lateral thinker
 - ✧ Results driven and have a desire to achieve
 - ✧ Sales ability and persuasiveness.
-

These examples illustrate that employers want much more than just essential technical skills. Even to do an apprenticeship as a junior, you are expected to have initiative, good presentation, high levels of accuracy, and good literacy and numeracy skills. To be a sales manager, the qualification is a university degree, but the personal qualities are spelled out in a long list, including lateral thinking, initiative, desire to achieve and so on. The automotive technician must not only be qualified, but also be self-motivated, versatile and willing to work overtime. The Department of Employment and Workplace Relations recognises this point when it notes: 'Qualified workers in occupations with good prospects may have difficulty in finding employment because of the specialised skills, experience and *personal attributes* being sought by employers, or lower regional demand for the occupation' (Department of Employment and Workplace Relations, Jobsearch website, emphasis added).

Suppose that Australia has sufficient qualified automotive technicians to fill all the vacancies, and they are willing to apply for the available jobs, but not enough are self-motivated, versatile and

willing to work overtime to meet employers' requirements. Is there a shortage? If there is, it is of a different form from the absence of specific skills and less easily within the reach of the VET system to address.

The precision with which we identify skill shortages matters most when a public-policy response is expected. If employers claim that workers are not what they used to be, there is no harm in that. It may even encourage them to reflect on what they can do to develop improved initiative, commitment, presentation and lateral thinking skills among their workers. But if employers seek to induce a public-sector response to their concerns, then we need to enquire more closely into the nature of the problem.

A typology of skills shortages that takes account of these points is as follows:

Level 1 shortage:

- ✧ There are few people who have the essential technical skills who are not already using them and
- ✧ There is a long training time to develop the skills and/or
- ✧ The capacity of training organisations in the relevant field is fully utilised.

Level 2 shortage:

- ✧ There are few people who have the essential technical skills who are not already using them but
- ✧ There is a short training time to develop the skills and/or
- ✧ The capacity of training organisations can be readily expanded.

Skills mismatch:

- ✧ There are sufficient people who have the essential technical skills who are not already using them, but they are not willing to apply for the vacancies under current conditions.

Quality gap:

- ✧ There are sufficient people with the essential technical skills, not already using them, who are willing to apply for the vacancies, but who lack some qualities that employers think are important.

Clearly, Level 1 shortages are those which will present the most severe obstacle to the expansion of firms and which require longer-term planning within the training system. This planning is required to anticipate skills needs as far as this is possible and to ensure that the system has the necessary capacity to provide the required training. Where it takes only a short time to acquire the necessary skills (for example, Certificate III in Aged Care) and many people have the ability to learn these skills, then the normal adaptation mechanisms of the labour market are likely to work quite well to ensure that any shortage does not persist (unless demand continues to expand rapidly).

A chronic problem

In this section I reflect briefly on why a dynamic, market-driven labour market produces a situation of persistent skills shortages. If the cause can be understood, then it helps in determining how to mitigate the problem.

If left up to themselves, the choices that individual workers and employers make will produce levels and quantities of skills that are systematically less than are needed (and attainable) to generate maximum output and growth. There are many reasons for this, but they each have the feature that the person/firm who is making the training decision is unable to capture the full benefits of the extra skills that they get from such training. Firms readily recognise the problem of poaching—where a worker whom they have taken the trouble to train leaves for a job with another firm. But there are other important circumstances as well. Skilled workers often increase the productivity of sophisticated equipment and of others with whom they work, but they themselves

do not benefit from this in the form of higher pay. Firms that operate in an environment where skills are scarce will be reluctant to invest in sophisticated production methods that require a highly skilled workforce. This in turn reduces the opportunities for skilled workers and hence the enthusiasm with which people seek to acquire skills. This interaction can lead to what Booth and Snower (1996) call the 'low skill, bad job trap'. That is, a market economy can find that the individual incentives that workers and firms face lead them to invest too little in the development of skills, when judged from the perspective of the whole economy.

Economists who seek to explain why some countries have higher rates of economic growth than others have established that high levels of skill among the workforce contribute both to high levels of national income and to higher rates of economic growth. A major reason for this is that more skilled workers make the adoption and adaptation of new technologies easier and cheaper. And these are the true engines of economic growth. This linkage (identified as 'new growth theory') provides evidence in favour of some explicit government support for education and training in the face of the many potential impediments to individuals and firms making socially efficient decisions about how much skills development to invest in. Traditional growth theory also provides a link between education and training and growth. Here, growth requires that the average level of learned skills rises per worker and thereby increases average productivity. This source of growth is likely to occur without government intervention, as the higher-productivity workers will get higher wages.

A different source of insufficient skills arises when people who have the ability and the motivation to learn important work skills find they cannot afford to pay the costs of doing so—even when the investment in skills will pay off over time. Australia has effectively dealt with this problem for skills that are learned in universities, through the Higher Education Contribution Scheme (HECS) and the more recent Postgraduate Education Loans Scheme (PELS). But there is no HECS equivalent for vocational skills. It is therefore likely that, although the total fees for technical and further education (TAFE) courses are not usually very high, nonetheless they will be beyond the means of some people who would otherwise have undertaken a TAFE course. Private VET courses vary in cost and many will present the same difficulty. This financing problem will lead to under-investment in VET qualifications and thus contribute, to some unknown extent, to skills shortages.

What can be done?

This brief account of some of the failures to be expected in the training market enables us to understand why the economy is likely to have a chronic shortage of skills, unless active steps are taken to offset the failures. And of course, a number of such steps are indeed taken. I mention here four of them.

First, general education, which is of value to many employers and hence not likely to be adequately supplied by any one of them, is heavily supported by taxpayer funds. This public subsidy of schools, TAFE and universities reduces the direct costs to students and to employers and diminishes the short-run financing problems that students and their parents face.

Second, the apprenticeship scheme (especially the traditional four-year apprenticeship) has several key features that are designed to deal with failures of private incentives. A term of four years, during which the apprentice is paid less than the tradesperson rate, means that the employer has a reasonable chance of recovering, in the later years, the cost to them of the training provided in the early years of the apprenticeship. That is, in the early years, the wage and training costs are expected to exceed the value of the output of the apprentice. But in the later years, the benefits to the employer exceed the wage and training costs that they have paid. This arrangement has the effect of smoothing out the wage profile of the apprentices, giving them more than they are worth early on and less than they are worth towards the end of the indenture. The costs of the apprenticeship in the Australian system are also borne in part by the taxpayer. There are direct subsidies to firms that employ apprentices and subsidised off-the-job training. The form of the indenture and subsidy of

the costs of training are both intended to counteract the inadequate incentives to train that firms and potential apprentices would face if left to themselves.

Third, unemployed people who are assisted through the Job Network are frequently offered free or subsidised training to assist them to develop the skills needed for specific jobs for which they can apply.

Fourth, Australia has a history of providing apprenticeships and informal vocational training through government business enterprises, including the public utilities (electricity, gas and water), the railways, transport and communications, and local government. These enterprises, free of the pressures of intense competition, had a culture of training at the vocational level and made a major contribution to the supply of vocational skills. Many of the people who were trained by these government enterprises subsequently moved into private sector jobs. It has been one of the unintended side effects of the privatisation of these enterprises (and corporatisation of those that remain in public hands) that the new private owners have substantially reduced their commitment to training.⁴

The sort of 'shortage' that has been briefly reviewed in this section may not appear in the form of vacancies or as an observed gap between supply and demand for any particular skill. Firms, for example, may adopt less-than-efficient technologies because they judge that they will not be able to find the skills needed for the superior technology. In this case, we will not observe vacancies, but the outcome will nonetheless be a lower standard of living than is attainable. The argument provides a general presumption in favour of some public support for training (especially the development of general skills that are of value to many different employers). It also invites judicious consideration of some forms of regulation of individual behaviour, such as a minimum school leaving age, minimum ratios of apprentices to tradespeople, and a minimum share of payroll to be spent on training.

To this point I have been treating the Australian labour market as if it were isolated from the rest of the world. For many occupations, this is a reasonable approximation, for the work must be done in close proximity to the demand (such as building and infrastructure, many personal services, retailing and transport). However, modern communications and transport technologies are making it increasingly feasible for some types of skills to operate in a global market. In Australia, many more people move to and from the country for temporary (but often quite long-term) work than make a permanent migration shift—referred to by demographer Graeme Hugo as a 'brain circulation' rather than a 'brain drain'. These tend to be higher-paid professional and managerial workers. In addition, Australia has a large and highly targeted program of permanent skilled migration. In 2005–06, there were 97 500 skilled visas available for permanent settlement, with priority given to people who had occupations on the Migration Occupations in Demand List. While most skilled immigrants are professionals (especially accountants and computing professionals), most of the trades occupations are currently (2006) on this list, although as yet only attracting small numbers of migrants (Birrell, Hawthorne & Richardson 2006, p.10).

It is increasingly unnecessary, however, for workers to relocate from one country to another in order to meet a skill need. Call centres, data entry and processing, computer programming and product development, and accounting functions are all being performed offshore for companies located in Australia—sometimes referred to as 'offshoring'. For a number of occupations and skills, then, it is necessary in an analysis of the extent of shortage in Australia to include an understanding of international skills flows. A comparison of labour shortages in ten countries (by major occupation group) suggests that Australia has a relatively high degree of shortage in the three top occupational groups of managers, professionals and technicians and associate professionals (Zaidi & Cohen 2003, p.10). This is likely to be a result of Australia's relatively robust rates of economic

⁴ Toner (2003) documents the decline in apprentice numbers over the period of the main privatisation and develops this interpretation of its cause.

growth for the ten years 1992–2001 and the relatively rapid rates of growth of employment in these occupations (see table 2).

Structural imbalances

A market economy is an extremely dynamic institution. Firms and their jobs are constantly being born, expanding, contracting and dying. In the year ending February 2004, 21% of workers ended a job they were in—1.5 million of them changed jobs, while 0.8 million ceased employment. Two-thirds left their jobs voluntarily and one-third had the job loss imposed on them (Australian Bureau of Statistics [ABS] 2004). Employment in some occupations has expanded quite quickly, while in others it has contracted. For example, in the 15-year period between 1986 and 2001, there was a net increase of 88 000 jobs for computing professionals; 4000 jobs for general mechanical engineering tradespersons; 29 000 jobs for cleaners; and 197 000 jobs for sales assistants. At the same time, there was a net *fall* in employment of 25 000 metal fitters and machinists; 9000 communications tradespersons and 3000 carpentry and joinery tradespersons (among many others) (Cully 2002, pp.152–3).

Many skills take years to acquire (especially professional and technical skills) and are quite specific to a particular type of work. For example, a music teacher cannot readily become an accountant; a chef cannot readily become an electricity linesperson. It is inconceivable in such an environment that there will be a continuous precise match between the types of skills required and the types of skills the workforce has to offer. When there are sizeable levels of unemployment, under-employment and non-employment, much of this inevitable imbalance is hidden from the notice of firms. With a few exceptions, they find that, when they advertise a job, a number of people with the relevant skills apply—sometimes a large number. They are then able to look for additional qualities, such as precise relevant experience, desirable personal qualities, evidence of enthusiasm and potential commitment to the firm. From the employers' perspective, the skills system therefore seems to be working quite well. However, the consequences of the imbalance are borne by workers, who cannot find employment that uses the skills they have laboured (and paid) to acquire. More skilled people can usually find work ahead of less skilled people (since the former can generally do the latter's work, but not vice versa). For example, the metal fitters and machinists can become truck drivers or cleaners. But there are many cases when the jobs they get do not make use of their formal qualifications or less formal skills.

As table 1 shows, in 2001 there were, for example, 18 000 people with university degrees working in elementary sales jobs and about 70 000 people with skilled vocational qualifications working in each of truck or train driving and labouring jobs. In total, 11% of workers with skilled vocational qualifications were working in the occupations listed, none of which required their level of skills. We recognise that some component of people working below their skills is voluntary, in that people value aspects of jobs such as geographical convenience, suitability of hours and the quality of the workplace. But to the extent that it is not voluntary, these mismatches are costly to the individual and to the economy. The value of this loss is rarely calculated, or even noticed.

As the overall labour market tightens, the structural mismatch between skills and job requirements becomes more apparent to employers. It is then that we start to hear about skills shortages, and the extent of the mismatch becomes an issue of policy concern. These periods of high overall labour demand, when skills mismatches come to the surface, provide a valuable opportunity to evaluate the total skills development system for its capacity to be responsive to the needs of both employers and workers.

Table 1 Selected occupations by selected qualifications, 2001 ('000)

Occupation	Bachelor degree	Undergraduate 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 (2001); author calculations

The degree of mismatch will be greater in areas of the economy in which there is rapid structural or cyclical change—either in the type of work done or in the quantity of jobs. Thus the first place to look for evidence of skills shortage is among occupations that have been growing rapidly. Table 2 shows, at a broad level, which occupations these are.

Table 2 Employment growth by occupation, 1997–2006

Occupation	Employment 2006 ('000s)	Employment growth 1997–2006 ('000s)	Average annual net employment growth 1997–2006 % p.a.
Managers and administrators	848.4	211.0	3.7
Professionals	1 995.1	556.2	4.3
Associate professionals	1 252.9	341.4	4.2
Tradespersons and related workers	1 303.1	159.1	1.5
Advanced clerical and service workers	387.2	11.2	0.3
Intermediate clerical, sales and service workers	1 689.3	291.1	2.3
Intermediate production and transport workers	842.3	71.4	1.0
Elementary clerical, sales and service workers	965.3	95.1	1.2
Labourers and related workers	858.5	22.3	0.3
All employees	10 142.2	1 734.4	2.3

Source: Calculated from ABS (1997–2006, table 07)

The most rapid growth in employment has been at the top end of the labour market: managers and administrators, professionals and associate professionals. All the other occupational groups had below-average growth, especially advanced clerical and service workers and labourers. Over the decade of employment growth, in which an extra 1.7 million jobs were created, about 159 000 (or 9%) were for trades skills. The overwhelming picture is one of low growth for jobs that require VET qualifications. Note that the growth in the number of *hours* of work (as distinct from number of people) is even more focused on the high-end jobs, as many of the less skilled jobs are part-time.

Table 3 supports this general picture by providing a more detailed look at the fastest growing occupations and taking a longer time span.

Table 3 Numbers of additional jobs in the ten fastest growing occupations 1986–2001

1	Sales assistants	197 449
2	Computing professionals	88 185
3	Project and program administration	68 247
4	Childcare workers	53 720
5	Sales representatives	44 130
6	General managers	58 061
7	Accountants	50 968
8	Sales and marketing managers	61 019
9	Waiters	47 077
10	Special care workers	45 569

Source: Derived from Cully (2002).

How the market works

Ultimately, much in the discussion of the character of supply and demand is saying something rather simple. There is no fixed quantity of any particular skill supplied to the economy; nor is there a fixed quantity demanded. Rather, supply will rise as the terms of employment become more attractive; and demand will fall as the costs of employing people with particular skills rise. These are the conditions necessary for the forces of supply and demand to work through the market to solve the problem of a shortage.

The main instrument for solving shortages or surpluses in the labour market as elsewhere is the 'price'. At its simplest, this is the hourly or weekly pay. But it can also include other aspects of the rewards for employment, such as superannuation, significant skills development, childcare and family-friendly working arrangements. The framework of supply and demand, while elementary, is nonetheless helpful for thinking about the problem of shortage.

The following are the key ideas relevant for considering shortage, and whether it can be left to the market to resolve.

- ✧ The quantity supplied and demanded should be considered in terms of hours, rather than the number of people.
 - ◆ This means that one response to a skill shortage is to increase the number of hours that suitably skilled people work.
- ✧ The wage should be considered as the net benefits of working (on the supply side) and the total costs of employing (on the demand side). These will differ because of on-costs and income tax. But there are other important differences too, including:
 - ◆ the amount of training or skills development an employer provides
 - ◆ the non-financial attractions of the job, that is, elements impacting on the quality of working life, for example: the physical conditions of the workplace; the degree of flexibility of employee work hours; the intrinsic interest of the work; the intensity of work; support for childcare; job security; freedom from harassment and discrimination; opportunities for overtime work at the choice of the employee; whether there is a culture of long hours of work; whether work is expected in unsociable hours
 - ◆ the prospects of advancement on the job or for using the current job as a springboard to a better job elsewhere
 - ◆ the costs to the employer of fitting the new worker into the current work team—including developing their technical and interpersonal skills to the required level and learning local aspects of the job

- ✧ By increasing the ‘wage’, the supply of hours is increased and the demand is decreased.
 - ◆ As the desired skills become more expensive, firms find ways to reduce their use of such skills, for example, by using less-skilled people to do some parts of the job or by changing the way work is done (that is, using concrete slabs instead of brick walls, so reducing the need for expensive brick layers).
 - ◆ Products that need expensive skills in their manufacture rise in relative price and this reduces the amount sold (and the number of skilled people needed).
- ✧ The slopes of the demand and supply curves may be steep, or they may be flat.
 - ◆ The slope represents the responsiveness of supply or demand to a change in the ‘wage’. If they are very responsive, then a small change in wage will cause a big change in the quantity supplied and demanded, and the market is likely to work well in resolving the shortage. The market will not work well if *both* supply and demand are unresponsive to the wage.
 - ◆ The slope of the demand and supply curves varies among skill groups; for this reason each skill market will have its own characteristics and needs its own study.
 - ◆ Skills that are easily and quickly learned and are widely used (for example, basic word processing) have a more responsive supply; skills that are difficult to learn, take a long time to acquire and/or are unusual (for example, petroleum geology) will have an unresponsive supply.
- ✧ If the wage rises in response to a skill shortage, all of the people who are already employed using those skills will gain, as well as those recently attracted to such work.
 - ◆ This is a major reason why firms consider all ways for dealing with a shortage *other than* raising the wage.
- ✧ Because they can attract workers away from another employer, individual employers will face a more responsive supply than will the economy as a whole.
- ✧ A surplus of a skill is socially inefficient and individually costly, as is a shortage.
 - ◆ Creating an oversupply of particular skills is not an efficient response to the possibility of shortage.
 - ◆ An oversupply in one period is likely to lead to a shortage in a future period, as new entrants shun training in a field in which they observe oversupply. (A good current example of this is in the information technology field, in which local surpluses are being aggravated by high levels of migration.⁵)
- ✧ The market for skills that are easily learned will generally sort itself out: the greatest policy and business concern should be for skills that have a long training period and where there is not already a good stock of suitably skilled people who are not using their skills to maximum effect.

There is good empirical evidence (for example, Blandy & Richardson 1982) that wages do move in response to shortages and surpluses of particular skills. But they do not move a great deal, and many other forms of non-wage adjustments occur to improve the balance between supply and demand.

In understanding how the labour market adjusts to shortages of particular skills, it is helpful to appreciate that, for many people, the employment relation is long-term. In 2004, 41% of employed people had been in their current job for more than five years and 24% for more than ten years (ABS 2004, table 2). Even if a particular job does not last for a long time, the characteristics of the job will provide both current and future benefits (or in some cases, detriments). The most important of the future benefits is the development of new skills on the job. This longer-term perspective yields important insights into how labour markets adjust to shortages and surpluses. The current wage is only one component of the overall benefit from the job. The other main component is its impact on the worker’s future wage path, either with the current employer or in some other job. In deciding whether a job is attractive, a worker will have an eye not just on the current wage, but also on where the job is likely to take her or him in the foreseeable future. An

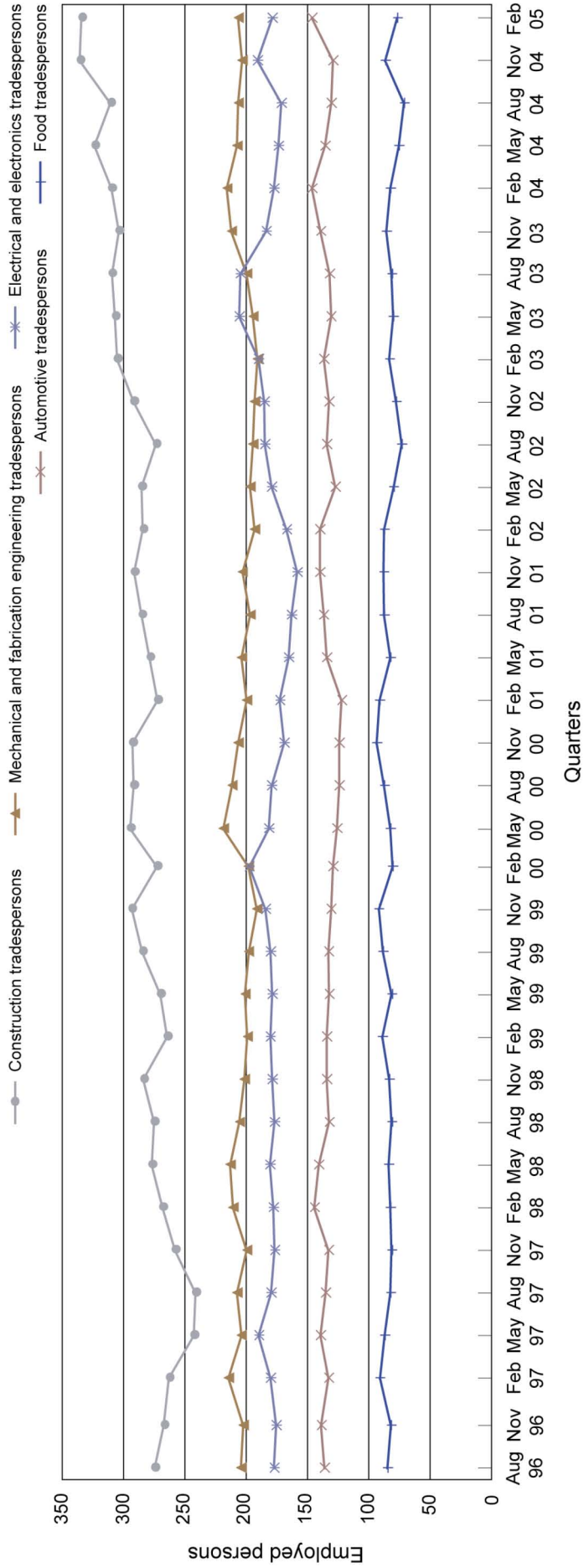
⁵ To illustrate, Monash University has experienced a fall in information technology student numbers from 5800 in 2002 to 2600 in 2006 (*The Australian* 2006)

important consequence of this is that jobs in expanding industries are much more attractive (for the same current wage) than are jobs in static or declining demand. The former will provide greater job security and confidence in the continuing relevance of the skill. It will also provide opportunities for advancement. Jobs in declining demand, even if there are current vacancies, present the opposite future. This helps us to understand why people are reluctant to enter the trades, even when current pay looks good. Figure 1 shows the course of employment in the trades over the past nine years.

Figure 1 shows that there has been almost no growth in employment in the key trades areas over a nine-year period. This is consistent with data presented in tables 2 and 3. The exception is the building trades, but they are clearly sensitive to the business cycle. The lack of any history of growth in employment in the trades makes them much less inviting as areas of employment, for a given wage, than they would be if employment were expanding. It is not surprising, then, that young people do not queue to equip themselves for such jobs, especially when this pattern of non-growth is contrasted with the rapid growth in employment of semi-professional, professional and managerial jobs. At the same time as these latter jobs have been expanding rapidly, so too has their relative current wage. Thus the overall employment prospects in these jobs are much more attractive than are the trades. With this in mind, it is clear that, if firms wish to expand their recruitment of trades skills, they will need to compensate for the poor career prospects presented by recent experience. They can do this by offering a substantial rise in current pay or by offering training that builds on the trade skills and which can lead to jobs in expanding sectors of employment.

There is a second wage-like adjustment that helps to explain how labour markets actually adjust to shortages. This is variation in hiring standards. Where there is some general slackness in the labour market, when a firm advertises a job, it will receive a number of applicants. It could reduce the pay on offer until only one person applied (that is, use the current wage to equilibrate supply and demand). But this is not what actually happens. Instead, firms use the existence of a pool of applicants to increase the quality of the workers they recruit for a given wage. To the worker, this is the equivalent to reducing the pay, because a constant-quality worker will find, when there are surplus workers, they have to apply for lower-paying jobs before they will be placed at the top of the queue. For the firm, the effect of raising the quality of the workers who are hired is also the equivalent to cutting their pay, since they get better quality for their money. However, it has the advantage of not disturbing the relative pay rates that currently prevail within the firm. This process also works in reverse. When a particular occupation moves from a position of surplus workers to a shortfall of workers, then firms will not be able to recruit from an inviting pool of applicants. Instead, they will find that they have to reduce their expectations of the 'quality' (including, perhaps, the motivation, initiative, experience, presentation etc.) of the people they can recruit for the pay and conditions on offer. This acceptance of a reduced quality will, for a constant-quality worker, be the equivalent of an increase in pay. It will appear this way also to the firm. Evidence of the importance of quality adjustments in equilibrating the labour market is presented in Blandy and Richardson (1982).

Figure 1 Number of people employed in the main trades, 1996–2005



In addition to the natural effects that expanding areas have on workers' expectations of longer-term earnings and the use of quality adjustment by firms, the literature has identified a number of other ways in which firms adjust to shortages. These include:

- ✧ increasing the recruiting effort
- ✧ recruiting more widely (different media, a wider geographical region, categories of people who are not usually considered)
- ✧ paying a recruitment bonus to existing employees who find suitable new workers
- ✧ increasing overtime
- ✧ altering production methods to reduce the need for the skill in short supply
- ✧ substituting capital for the skills in short supply
- ✧ substituting new technology for the skills in short supply
- ✧ training or supporting the education of new workers/workers with new skills
- ✧ improving working conditions
- ✧ paying a sign-on bonus (this is better than a higher wage, because it is confined to the new recruits)
- ✧ raising wages; however, they:
 - ◆ have to be paid to all current workers (including probably many who are not in short supply)
 - ◆ are hard to reverse
- ✧ contracting-out the work.

How to recognise a skill shortage

The usual way of learning that there is a shortage of particular skills is to ask (or be told by) employers. For several reasons, this is not very reliable.

- ✧ Employers have every incentive to exaggerate the problem of shortage in the hope that someone else will assist them to find the skills they want without their having to make the jobs more attractive for their workers and hence more costly for them as employers.
- ✧ Employers (as Green, Machin & Wilson 1998 show) interpret shortage in a variety of ways and do not act consistently when dealing with an environment they characterise as one of shortage.
- ✧ This is one area where we expect unions and employers to have common cause. It is in the interests of both groups to exaggerate the problem of shortage.

If we do not want to rely heavily on employer statements about the areas and extent of skill shortages, what else can we do?

One group with a close ear to the ground, in terms of skills in demand and difficult to find, is the recruitment firm. The government could establish a regular feedback system from such firms (for which it might have to pay). Individual VET providers or the TAFE system at state level could do the same with recruitment firms that operate in their geographical area. It would be necessary to establish a common set of understandings of how to evaluate and report types and degrees of shortage.

Constructing an index that incorporates the various signs of labour shortage generated by the labour market is another strategy that could be used. These signs include:

- ✧ rising wages
- ✧ low unemployment
- ✧ persistent vacancies
- ✧ increasing use of overtime (paid or unpaid)
- ✧ increasing use of temporary workers
- ✧ improving terms of employment
- ✧ low rate of redundancy/dismissal of workers and high rates of quits
- ✧ employment of people with lower-than-average levels of formal qualifications and/or experience
- ✧ increasing employment of 'non-traditional' types of workers, such as women/men (depending on the job), older workers and recent migrants
- ✧ substitution of more abundant for less abundant skills in the technology of work
- ✧ substitution of capital and new technology to economise on the short skills.

This is a long list. In practice, a sub-set of this list should be satisfactory, with components chosen to reflect the quantity and quality of data that are available or easily collected. The Department of

Employment and Workplace Relations uses such an approach in the construction of its advice on where good employment opportunities lie. It includes information on:

... occupational projections provided by the Centre of Policy Studies (CoPS) at Monash University (from the MONASH model); actual employment growth in recent years; industry employment growth and prospects; vacancy trends; industry surveys; and qualitative information on occupational developments from employers, recruitment agencies, employer organisations, education and training bodies and labour market intermediaries.

(Department of Employment and Industrial Relations Jobsearch website)

The provision of good intelligence on the state of the labour market is a most effective strategy for assisting normal market mechanisms to resolve shortages more rapidly. The literature identifies many sources of lags in the adjustment process, many of which arise from a lack of awareness on the part of employers and workers of the areas of emerging skill shortage. The Australian Government has a number of valuable initiatives for the collection and dissemination of such intelligence. There is also an important role for industry associations in routinely collecting data that reflect the state of the labour market in relation to skills important for their members. It is expensive for any individual firm to do this and the information is valuable to a wide range of firms once collected.

When should government intervene?

The starting position should be that finding the skills considered necessary is one of the core tasks of a business, akin to finding the capital and the customers. Firms that do this well (and are able to retain and motivate their skilled workers) will prosper, and those who cannot will languish. A case needs to be made therefore, one that argues that there is some public interest in helping firms to increase their required stock of skills before governments take steps to assist firms with problems of labour shortage. As discussed earlier, there is a strong case for continuing government support for the development of high levels of general proficiency among the population, upon which the learning of specific work skills can be based.

We can identify some circumstances in which it is beneficial to use public resources to assist firms to expand the pool of specific skills. The government (in some form, including the VET system) should intervene if the decisions of employers, individual skilled people and the training institutions have impacts on third parties. There are a number of ways in which this can occur. These include when the employment of additional workers with the skills in short supply will:

- ✧ lead to increased employment of workers who are in abundant supply
- ✧ increase the productivity of other workers
- ✧ increase levels of economic activity in a declining region
- ✧ reduce the mismatch between skills in demand and skills that are supplied, in ways that reduce the level of structural unemployment and inflationary wage pressures.

In practice, we must recognise that the government already has a substantial role in affecting the level and types of skills in the economy. It does this as a large employer (which does more than average skills development among its own employees). It also funds and regulates a high proportion of the education and training system. We also need to recognise that employers, especially large employers, play a major role in developing the skills of the workforce through opportunities for learning provided on the job.

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Appendix 1:

Skills Consortium publications

The following is the complete list of titles produced by the National Institute of Labour Studies, Flinders University and the Centre for Post-Compulsory Education and Lifelong Learning, University of Melbourne, through the research project, A Well-skilled Future: Tailoring VET to the Emerging Labour Market.

Forecasting future demands: What we can and cannot know

Sue Richardson and Yan Tan

Future skill needs: Projections and employers' views

Di Lowry

Demographic impacts on the future supply of vocational skills

Yan Tan and Sue Richardson

Skill acquisition and use across the life course: Current trends, future prospects

Bill Martin

What is a skill shortage?

Sue Richardson

Changing forms of employment and their implications for the development of skills

Sue Richardson and Peng Liu

Changing work organisation and skill requirements

Bill Martin and Josh Healy

Social area differences in vocational education and training participation

Richard Teese and Anne Walstab

Participation in vocational education and training across Australia: A regional analysis

Anne Walstab and Stephen Lamb

Overcoming barriers to participation: Three regional case studies

Anne Walstab and Kira Clarke

Current VET strategies and responsiveness to emerging skill shortages and surpluses

Jack Keating

Matching supply and demand: International perspectives

Jack Keating

Impact of TAFE inclusiveness strategies

Veronica Volkoff, Kira Clarke & Anne Walstab

Models of TAFE inclusiveness: Case studies of three Australian regions

Kira Clarke & Anne Walstab

A well-skilled future

Sue Richardson and Richard Teese



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The consortium, *A well-skilled future: Tailoring vocational education and training to the emerging labour market*, comprises researchers from the National Institute of Labour Studies in South Australia and the Post-compulsory Education and Lifelong Learning in Victoria. Its program of research aims to investigate future work skill needs and work organisation arrangements, and their implications for vocational education and training.

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