

Education, earnings and the labour market

Report for Skills Australia

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Contents

Contents	i
List of Tables	ii
List of Figures	ii
1 Earnings and education	3
1.1 The human capital framework	3
1.2 What are qualifications worth in the labour market?	6
1.3 Screening theory	23
1.4 Holes to be filled	25
2 Earnings and the labour market	30
2.1 Earnings and productivity	30
2.2 Wage inequality	36
2.3 Qualifications, skills and employers	40
3 Labour market adjustment	48
3.1 The current policy context	48
3.2 The costs of economic restructuring	49
3.3 Labour market adjustment	50
3.4 Conclusion: the educator's burden	58
Appendix	61
A Appendix for regression modelling	61
A.1 The HILDA dataset and modelling approach	61
A.2 Modelling results	63
Notes	70
References	72

List of Tables

1.1	Preston model results, 1991	8
1.2	Earnings premiums, initial results, Cully models (%)	10
1.3	Earnings premiums, controlling for level of schooling, Cully models (%)	11
1.4	Earnings premiums, Ryan models (%)	11
1.5	Earnings premiums, Leigh models (%)	13
1.6	Earnings premiums, Watson model (%)	16
2.1	Highest non-school qualifications by occupation, 2006 (%)	42
2.2	Reported overskilling in employment (%)	46
A.1	Conventional linear regression: model 1	63
A.2	Conventional linear regression: model 2	64
A.3	Conventional linear regression: model 3	65
A.4	Heckman selection approach: model 4	66
A.5	Heckman selection approach: model 5	67
A.6	Heckman selection approach: model 6	68
A.7	Panel data: model 7	69

List of Figures

1.1	Graduate salaries relative to average weekly earnings 1977–2010	21
2.1	Indexes of labour input, Existing & Experimental (%)	34
2.2	A model of wage determination	39
3.1	The Danish Flexicurity Diagram	57

Preface

This report is a theoretical journey through the landscape of educational qualifications and the earnings attached to them. It is primarily an account of the labour market, and education features in only a subsidiary way. This reflects my own background as a labour market researcher, rather than the relative importance of these two areas. The implications for VET are certainly canvassed, but the problems posed by labour market change are central to this story.

While theoretical in scope, the report also includes a section of original econometric modelling using some of the latest survey data available (2009). There are also a number of excursions into other domains, such as the various historical and sociological asides which arise in various parts of the report. These may appear distractions, but it is my contention that unpacking theoretical concepts requires an understanding of the historical and sociological contexts in which those concepts apply. For example, unpacking productivity and earnings requires not only an understanding of their conceptual elements, but also insights into how they have played out in the Australian labour market in recent decades.

While the core of the report is the labour market, the theme around which much of the analysis revolves is human capital theory. There are many debates in this field, and I only touch on these briefly. I do not wish to rehearse familiar arguments. I think greater value lies in delving more deeply into the core concepts which human capital theory relies upon, particularly those around productivity and earnings. Pushing these further than they are usually taken is a worthwhile exercise and is justified by the theoretical scope of this report. At the same, however, the report also presents summaries of a number of recent empirical studies on qualifications and earnings in Australia. This section of the report also contains the original econometric analysis mentioned above.

Consequently, this report is both theoretical and empirical, and its presentation alternates between a logical sequence of concepts, a summary of some economic modelling, and a more discursive narrative about the recent past. While certain core arguments are presented forcefully, the goal is not polemic but illumination.

Glossary of terms

While unpacking concepts and drawing distinctions is an integral part of this report, its worth defining at the outset a few key terms.

Education, training and skills are not interchangeable. The former refers to that which happens in an educational setting (and is equivalent to ‘formal education’). It thus excludes ‘learning by doing’ and other informal methods of learning. Training here refers to both in-house (workplace) and external (educational setting) training,

and is characterised by its content (vocational knowledge) and its orientation (the workplace). Skills are given a section of their own in this report, so I won't try to define them here, except to note that they are primarily discussed in the context of workplace skills.

Qualifications refer to the degrees, diplomas and certificates which are awarded following successful completion of a formal educational course. The terms *credentials*, on the other hand, is more generic in nature and carries with it the notion of the credentialing function of qualifications. It thus lends itself to the concept of *credentialism* (that is, qualifications inflation). *Certification* is a more limited concept and refers to the process whereby skills, for example, get formally acknowledged. It has links with concepts like licensing or professional accreditation.

Wages and *earnings* are sometimes used interchangeably in this report, and sometimes they are distinguished. Technically they are different, since wages refers to hourly rates of pay, while earnings takes account of the hours worked and represents the money actually received by the worker. In a more general context, they are interchangeable in that they both refer to money from labour market activities and should thus be distinguished from concepts like income and wealth. *Income* is a more global term for the money received by a person and can include labour market earnings, as well as money from government transfers, or from share or rental property ownership. *Wealth*, on the other hand, refers only to assets. Neither income nor wealth are discussed in this report and the discussion of inequality which does arise mainly focuses on wage inequality.

Neoliberalism refers to the political philosophy which dominates our era and is characterised by the view that market mechanisms provide optimum outcomes and should be extended into as many domains of life as possible. While its ideological roots lie in the writings of thinkers like Friedrich Hayek and Ayn Rand in the 1940s and 1950s, its political revival is usually dated to the late 1970s and early 1980s with the rise of Thatcher and Reagan. In Australia, the Hawke Labor Government ushered in the era of neoliberalism and it was enthusiastically continued by the Howard Government. David Harvey distinguishes neoliberalism from 'embedded liberalism', the philosophy which prevailed before the 1970s (Harvey 2005). Its adoption in different countries has always been an uneven process, with a milder version of neoliberalism in continental Europe often distinguished from its more extreme versions in the Anglo-Saxon world.

While *neoclassical economics* provides the inspiration for neoliberalism, the terms are not interchangeable. The latter is clearly broader and has a well developed political and ideological presence in everyday life. The former term is restricted to the discipline of economics, and is synonymous with 'mainstream economics' or 'orthodox economics'. It is largely microeconomic in perspective, in contrast to the macroeconomic framework of Keynesianism. It is characterised by an emphasis on econometric modelling, and its focus is marginalist, drawing on the framework established by Alfred Marshall.

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1. Earnings and education

1.1 The human capital framework

In essence, human capital theory suggests that a person's earnings reflect their levels of education, training and experience. More precisely, the theory posits that the latter are forms of investment made by an individual, and that the rate of return on these investments can be calculated using earnings functions. In practical terms, there may be costs for individuals in obtaining more education or training, but such an investment can be worthwhile because life-time earnings can be increased by the greater earning capacity which education or training induces. In the context of public policy, human capital theory gives rise to questions about how the costs of education or training should be met, and how the benefits might be captured? These questions are often pursued in terms of relative shares between individuals and governments, with implications for issues like funding and fees.

While the concept of human capital goes back several centuries (Marginson 1993, pp. 31–34), the development of an econometrics research program based on implementing the theory can be dated to the early 1960s and the pioneering work of Gary Becker, Jacob Mincer and Theodore Schultz. By the late 1960s this research program had become prolific and the use of Mincer-style earnings functions had become a standard part of econometrics: calculating rates of returns spanned areas as diverse as education, training, health and migration (see the overview by Blaug 1976).

Some useful distinctions

It is useful, at the outset, to draw a number of important distinctions which become relevant in later parts of this chapter. The first important distinction is between wages and earnings. The former is the rate of pay which prevails in a particular job, and is often measured in econometric studies as an hourly rate of pay. The latter is the actual money which individuals earn from their labour market activities and is commonly collected as weekly or annual earnings. What an individual earns is thus dependent not only on the rate of pay, but also the amount of labour they supply. That is, the number of hours worked (for weekly earnings) and the number of hours and weeks worked (for annual earnings). In practice, researchers often construct rates of pay by dividing earnings by hours (or weeks) worked, since what employers actually pay is rarely available in most household-level data sets. This distinction matters because human capital theory is really about earnings, not rates of pay.

Secondly, whether one uses wages or earnings, a common practice is to regard this as an outcome variable and to regress this on a set of explanatory variables, which include human capital variables such as education and experience. As we will see later

the additional variables—such as industry and occupation—make a considerable difference to how one interprets the results. From this regression modelling one generally concludes that particular variables have a wages premium (or penalty) attached to them.

When it comes to educational variables, such as years of education or a particular qualification, the premium can be regarded as the return on education. This is common practice, even outside the realm of human capital theory. In the case of wage decompositions, used widely in the discrimination literature, one distinguishes between how much a ‘privileged’ worker earns by virtue of their characteristics and how much they earn because of the *returns* on those characteristics.

The return on a variable such as education is not, however, the same as a rate of return. The latter is the mainstay of human capital theory and involves an extra stage of analysis. While it starts with the wage premium attached to education, it then proceeds to take account of the lifetime earnings which that premium might lead to and the cost of obtaining that education. Such rates of return can be both social and individual and I will discuss this issue more fully below.

Why it matters

These various methodological and conceptual distinctions matter for a number of reasons. First, directly comparing different studies is not straight-forward. Some researchers provide wage premiums, some provide rates of return; some researchers construct ‘pure’ human capital earnings functions, others construct more comprehensive labour market models which include a large range of explanatory variables.

Secondly, as one moves further along the pathway from wage premiums to rates of return, more and more assumptions need to be taken because there is usually a paucity of relevant data. One needs to make assumptions that deal with a host of departures from the pure theory. What is the lifetime earnings for a cross-sectional population where we only have their weekly wages at one point in time? How does this differ for women, with their interrupted working-lives? What about unemployment, and periods out of the labour force? How does one deal with people studying part-time, or those studying full-time but holding down a part-time job? What difference does it make if studies commence for an adult during mid-career? A particular set of answers to these—which then become assumptions in the modelling—can produce quite different rates of return to those obtained with another set of answers. I pursue this theme in greater detail below.

While moving from wage premiums to rates of return is largely an accounting exercise, moving from inequalities in earnings to human capital theory is a conceptual journey. To complete this transition it is also necessary to take on board certain assumptions about individuals and firms. First, human capital theory presumes individuals make particular future-oriented decisions: ‘the fundamental notion of human capital, of foregoing current income for the prospect of increased future earnings’ (Welch 1975, p. 65). Secondly, it further assumes they have the knowledge, at least in general terms, of their likely future earnings and of their current educational costs. Thirdly, human capital theory also assumes that employers accept the link between education and productivity, and that they are aware of how much extra productivity they are acquiring when they hire a more educated person. The linkages between edu-

cation, productivity and earnings are a critical part of the overall framework, something which I deal with in the next chapter.

Some background

In his comprehensive review of human capital theory, Marginson distinguished three phases in the modern implementation of the theory (Marginson 1993, pp. 40ff). The 1960s was the heyday of the concern with social rates of return, with a commitment to public expenditure on education as a way of fostering economic growth. The 'growth accounting' approach of economists like Schultz and Denison were influential during this period. The second phase, during the 1970s, was a 'period of eclipse' in which disillusionment with the promise of public investment in human capital emerged. Graduate unemployment, for example, raised doubts over the capacity of education to foster economic growth.

This is not to say that human capital theory ceased to have influence: its impact within academic econometrics continued to grow as it steadily achieved a hegemonic position as the orthodoxy for studying wage determination. Rival theories, such as the screening hypothesis, as well as various segmented labour market approaches, were far more influential within sociology than within economics (see, for example, Edwards 1979; Piore 1983; Reich 1984). Mainstream economics regarded this field of study with considerable skepticism (see, for example, Cain 1976). The period of 'eclipse' was more a reflection of the theory's diminished influence in the realm of public policy rather than its status in universities.

The third phase, from the mid-1980s onwards, saw this change, as human capital theory re-emerged with the imprimatur of the Organisation for Economic Cooperation and Development (OECD) (Marginson 1993, p. 48). It was now a more sophisticated theoretical framework, which incorporated elements of screening theory, and its notion of the link between education and economic performance was more nuanced. Technological change was now a central component of the link and innovation was eulogised. Compared to the first phase, in which the social returns on educational investment were foremost in public policy, in this second phase it was private rates of return which were emphasised. As Marginson noted, this dovetailed neatly with the increasingly dominant policies of 'smaller government' and 'user pays' (Marginson 1993, p. 49). It thus provided the perfect avenue for the expansion of fee-based education. As the OECD commented in 1990: 'Even if graduates do have higher productivity, they are rewarded for this in higher earnings and therefore there is no obvious reason why the rest of the community should be expected to meet their study costs' (quoted in Marginson 1993, p. 49). The context for this renewal in human capital theory at a policy level was the rise of neoliberalism.

It was during this third phase of human capital theory that Australia's Hawke Labor Government introduced the Higher Education Contribution Scheme (HECS). Part of the impetus for this move lay in the recognition among some Labor stalwarts that the free education initiatives of the Whitlam Government had not led to a major increase in working-class students entering the universities. This left some of them disillusioned with educational reform and resentful that working-class taxes were subsidising the entry of middle-class students into high-paying professional careers. At the same time, however, the introduction of fees gained support from human capital

theory, in the form of the Wran Committee's report on user charges. Not only did they adopt a human capital perspective, but their commissioned research included modelling of private rates of return using the human capital framework (Marginson 1993, p. 51).

1.2 What are qualifications worth in the labour market?

In his overview of education and earnings David Card observed:

Education plays a central role in modern labor markets. Hundreds of studies in many different countries and time periods have confirmed that better-educated individuals earn higher wages, experience less unemployment, and work in more prestigious occupations than their less-educated counterparts (Card 1999, p. 1802).

But, as Card also added, whether this is a causal relationship or not is another matter. In this section I look at the recent empirical research in Australia which charts this linkage between qualifications and earnings.

Nearly all the empirical studies in this field employ some form of human capital earnings function, in that they fit a linear regression model to earnings, using education and experience as predictors. The earnings are usually expressed in logarithmic form, something which assists with the fitting of the model and also makes interpretation easier (the coefficients can be expressed as percentages). In its most basic form, this earnings function represents education in terms of years of completed education, while experience is often based on age. More sophisticated versions include qualifications and employ actual measures of labour force experience. Similarly, other predictors—such as demographic background, industry and occupation—are also often included. There is much at stake in all these variations, because *what is being explained* begins to change as the model specification changes.

What goes into a model

It's important to realise that the range of predictors included in a model make a considerable difference to how one interprets the results. Omitting certain predictors—such as qualifications, industry or occupation—means that the remaining predictors—in this case, years of education—are left to carry a larger load. In effect, this amounts to statistical confounding: the effect of these omitted predictors are 'embedded' in the coefficient for years of education. Sometimes such omissions are the result of inadequate data, more often they reflect a theoretical predilection. In the case of the more stringent varieties of human capital theory, for example, the assumption of a competitive labour market means that the returns on industry and occupation, for example, are equalised across the labour market and so these predictors can be deliberately ignored. (Technically, they form part of the residual which, being random 'noise', can be safely ignored.) For those with less faith in the concept of competitive labour markets, the inclusion of industry and occupation variables is necessary if the earnings function is to be free of bias. In the eyes of these researchers, the coefficients on years of education are likely to be inflated by the omission of these other influential predictors. I will demonstrate this phenomenon later in this chapter.

Occupation is a particularly interesting predictor. In one sense, entry into certain occupations requires particular qualifications, and the relative earnings of workers are very much influenced by their occupation. Hence the argument might be made that including occupation robs the education qualifications variable of some of its influence in determining earnings, since its impact is now indirect. Education determines who gets into certain occupations and this, in turn, determines earnings. The debates between human capital theory and screening theory have a bearing on how one interprets this relationship. Do qualifications simply play a sorting role, determining who gets into what occupations, or do they also enhance productivity and allow the person to earn more once in they begin working in that occupation?

In looking at the model specification, there is not only an issue around which predictors to include, but also the issue of the outcome variable. As canvassed earlier, should one look at hourly rates of pay, weekly earnings or annual earnings? The latter two entail considerations of labour supply, such as how many hours are worked, while the former is closer to the actual ‘worth’ of a job. On the other hand, if the concern is with prospective earnings and foregone earnings—as it should be with human capital theory—then the actual money earned, rather than the employer’s rate of pay, is presumably the relevant category.

While often the modelling is based on theoretical choices, sometimes it is based on pragmatic issues related to the data. If the actual years of labour market experience is not available, then this predictor is often proxied by age (less years of education and infancy). But the interrupted working lives of many women makes this device problematic, so one often finds the study population restricted to adult male workers.

In recent years, much richer micro-datasets have removed some of these limitations, but various problems remain unresolved. Other anomalies—such as junior rates of pay—make restricting the study population to adults a common practice. Other anomalies—such as the high incidence of casual employment—are often ignored, even though many of these workers are paid various casual loadings in lieu of holiday and sick leave.¹

These rich micro-datasets, many of them providing panel data on individuals over time, have been a boon to researchers: sophisticated empirical variations on human capital theory are now a widespread feature of most labour market research. Some economists, such as James Galbraith (1998), lament the displacement of macroeconomics, with its Keynesian framework, by microeconomics, with its neoclassical emphasis. Galbraith further suggests that this new empirical hegemony has been abetted by the availability of such rich micro-datasets. With so much data, it’s now easier for researchers to focus on individuals, rather than the macroeconomy, and to shape their interpretations in individualistic terms. While methodological individualism is inherent in neoclassical economic theory—and is thus the default perspective in human capital theory—the research practices of researchers reinforce this framework.

How education is cast

In its original formulation, human capital theory also incorporated training and on-the-job learning, but these have been rarely included in most earnings functions. Instead the emphasis tends towards variations on the educational component. The most basic variation entailed including education in the form of the highest qualification

held, rather than just years of education and this has been common in the literature since the early days. Such an inclusion is useful since it allows for direct comparisons between degrees, diplomas and certificates. Another variation is the inclusion of *both* qualifications and years which has the advantage of distinguishing between the ‘pure’ human capital component of earnings and that attributable to credentials. The PhD by Cheung (2006), to be discussed below, provides an example of this. Finally, another variation is the inclusion of *all* qualifications held, not just the highest, an approach which acknowledges the contribution made by earlier qualifications when it comes to current earnings. The study by Cully (2005), also discussed below, provides an example of this approach. Cully has pointed to the particular relevance of this issue for VET: focusing only on the highest qualification ‘is especially problematic when there are multiple pathways into qualifications, as there are with VET, and when trying to disentangle the separate effects of secondary school and VET’ (Cully 2005, p. 44).

These studies, as well as several other recent studies on education and earnings, are now briefly summarised. It is worth noting that, despite most of these studies making explicit reference to human capital theory, only the Ryan (2002) study actually calculates rates of return. The other studies all report earnings premiums, either in the form of model coefficients or as percentage increments.

Recent Australian studies

Preston, 1997

Alison Preston’s study showed that male degree holders earned nearly 90 per cent more than non-school completers. Certificate holders (with the particular level not indicated) held a premium of about 27 per cent, while those with a diploma gained about 56 per cent. These premiums are relative to a benchmark, that is, a contrast group. In the case of this study, these were school non-completers, individuals with no post-school or Year 12 qualifications. Those who did finish Year 12 had premiums over non-completers of about 13 per cent.

Table 1.1: Preston model results, 1991

Highest educational level	Coefficient	Premium (%)
Completed high school	.126	13.4
Certificate (basic, skilled and associate diploma)	.238	26.9
Undergraduate diploma	.444	55.9
Degree (including post-graduate)	.638	89.3

Notes: Dependent variable is log of weekly earnings. Note that to convert coefficients into percentage premiums one uses the formula: $100 * (\text{exponent}(\text{coefficient}) - 1)$. For small coefficients, the percentage is almost the same.

Source: Table 1 from Preston (1997, p. 55).

Population: Males.

A couple of things about these results are worth noting. First the coefficients are quite large, but they usually decline as more predictors are added to the model. Unfortunately, the specific details for the addition of occupation and industry—which invariably change the coefficients considerably—are not provided by Preston in her

article. Secondly, the highest education level variable is quite crude, for example, lumping together basic vocational certificates with skilled vocational certificates.

Cheung, 2006

Stephen Cheung's study included both years of education and qualifications. Qualifications were used to measure the effect of attaining the credential, often referred to as the 'sheepskin' effect. Unfortunately, Cheung did not specifically consider certificate qualifications. Apart from a degree, his only other post-school qualification was an undergraduate diploma. The major contribution his study makes is to net out the effects of credentialism:

...credentials play an important role in explaining the returns to education for young Australians. In particular, there is a sizeable and significant return to completion of a bachelor's degree for both males and females. There is no significant credential effect to high school graduation, while the results for undergraduate diplomas are mixed ...

Overall, the portion of the total return to education that can be attributed to credentials is of the order of one-third, and this figure appears to be slightly larger for males than for females. However, even after allowing for credential effects, the returns to years of education also remain important, and there is some evidence that these returns are non-linear (Cheung 2006, p. 5.13)

Cully, 2005

The study by Mark Cully provided the most detailed breakdown of the various VET qualifications. Furthermore, as mentioned above, Cully modelled other qualifications held as well as the highest. Looking first at comparisons with non-school completers for the highest qualification held (which makes it more comparable to Preston's study), Cully found a premium for degrees of 43 per cent for men and 41 per cent for women; diplomas had an advantage of 28 per cent for men and 20 per cent for women; and certificate III/IV were worth 13 per cent for men and 8 per cent for women.

As with Preston, these are relatively large figures, and this reflects the nature of the comparison group: those who left school early and gained no other educational qualifications. In an obvious sense this creates unrealistic comparisons, such as comparing a university graduate with an early school leaver. Furthermore, considering that some individuals have both completed year 12 and hold lower level vocational qualifications, this approach does not illuminate the net effect of those qualifications. That is, the first two columns in Table 1.2 combine the contribution made by a Year 12 completion with the contribution made by a VET certificate for someone with a vocational qualification who has also finished school. As Cully cautioned, part of the wage premium in this case was simply due to finishing Year 12 rather than the result of gaining a vocational qualification.

Cully's second comparison dealt with this problem by reporting all qualifications held, and making the reference group those without the particular qualification. In this situation, degree holders benefitted from their degrees by 25 per cent and 28 per cent (men and women), while the premium for diploma holders was 11 per cent

(both men and women). Only males benefitted from Certificate III/IV, with a modest premium of 6 per cent, with all other results not statistically significant.

While these results were an advance over the last set, they still suffered from one shortcoming. The comparison group included individuals without that particular qualification, but who may (or may not) have held other qualifications (Cully 2005, p. 48). Cully's final, and preferred set of results, are summarised in Table 1.3. The comparison group is non-school completers without post-school qualifications and the results are shown according to the level of schooling completed (that is, Year 12 and Year 11 or lower).

Presented in this way, we can compare the various combinations of qualifications and schooling status. These results demonstrate that higher-level vocational qualifications do bring a wage premium over and above completing Year 12, but lower-level vocational qualifications imply a *negative* return. For example, Certificate III/IV qualifications—for those with Year 12 completion—endow their recipients with a higher return than those simply completing Year 12: 18.5 per cent compared to 14.0 per cent for males and 12.7 per cent compared to 9.3 per cent. On the other hand, those with Certificate I/II qualifications—and who complete Year 12—are worse off than if they had just completed Year 12. For example, a male who completes Year 12 and has no post-school qualifications earns 14 per cent more than someone without Year 12, but a male who completes Year 12 as well as a Certificate I/II qualification, is only 10 per cent better off.

Table 1.2: Earnings premiums, initial results, Cully models (%)

Qualification	Comparison group			
	Non-school completers		Those without the qualification	
	Men	Women	Men	Women
Degree of higher	43.2	41.2	24.7	28.2
Diploma	28.3	20.4	10.8	10.5
Certificate III/IV	13.1	7.6	6.0	2.0
Certificate I/II	7.5	4.8	-0.3	0.7
Certificate NFD	5.1	10.0	-3.1	2.6
Year 12	13.8	8.9	10.6	7.5

Notes: These are percentage premiums, already converted from regression coefficients by Cully.

Source: Tables 11 and 12, Cully (2005, p. 46–47).

Population: Wage and salary earners, excluding school students.

Table 1.3: Earnings premiums, controlling for level of schooling, Cully models (%)

Highest non-school qual	Men		Women	
	Year 12	Year 11	Year 12	Year 11
Diploma	29.8	25.6	22.6	16.9
Certificate III/IV	18.5	11.2	12.7	4.1
Certificate I/II	10.4	5.6	7.0	4.0
Certificate NFD	4.8	5.7	13.2	7.2
No non-school qualification	14.0	na	9.3	na

Notes: Qualification holders compared with non-school completers.

Source: Table 13, (Cully 2005, p. 48).

Population: Wage and salary earners, excluding school students.

Ryan, 2002

As mentioned earlier, Chris Ryan's study not only modelled earnings premiums associated with educational qualifications but also calculated their rate of return, by making provision for whether the individuals were working while undertaking their studies. In terms of the first part of the analysis—the earnings premiums—Ryan's key finding was that employees with VET qualifications enjoyed about a 10 per cent advantage. For associate diploma graduates, when the comparison group were Year 12 completers, the premiums were 9.4 per cent and 7.6 per cent (males and females). For skilled vocational certificate holders, when the comparison group were non-school completers, the premiums were 13.8 per cent and 9.2 per cent (males and females). Finally, when it came to comparing diploma holders to certificate holders, the premium enjoyed by the former ranged between 10.3 per cent and 12.3 per cent. Table 1.4 summarises these results.

Table 1.4: Earnings premiums, Ryan models (%)

VET qualification	Males	Females	Comparison group
Associate diploma	25.9	20.5	School non-completers
	9.4	7.6	School completers
	10.3	12.3	Basic vocational
	10.7	10.4	Skilled vocational
Skilled vocational	13.8	9.2	School non-completers
	0.0	0.0	School completers
	0.0	0.0	Basic vocational
Basic vocational	14.1	7.3	School non-completers

Notes: These are percentage premiums, already converted from regression coefficients by Ryan.

Source: Table 3, (Ryan 2002, p. 26) (this is an exact copy of Ryan's table but with slight changes in wording).

Population: Full-time employees.

As well as estimating earnings premiums for different levels of qualifications, Ryan also considered the field of study. Compared to individuals with business qualifications, Ryan found the premiums were at least 5 per cent lower for individuals with qualifications in health, architecture and building, agriculture or miscellaneous fields (Ryan 2002, p. 30). Another of his findings, of considerable importance, was that short courses which did not lead to qualifications appeared to have no effect on earnings.

Moreover, incomplete VET qualifications (commenced during the previous five years) also had no effect on earnings.

As noted earlier Ryan's study was one of the few recent Australian studies which actually calculated rates of return. These entailed estimating the return on the individual's investment in undertaking educational studies, something which included a number of elements. There was the cost side of the equation: actual course costs (like fees, books and materials) and the foregone earnings when the individual was not able to work full-time. There was also the revenue side: the future earnings stream which resulted from obtaining the qualification. In pursuing this analysis, Ryan considered two student 'types'—young people and people in their mid-thirties—and two work-study combinations: full-time work with part-time study and full-time study and part-time (or nil) work (Ryan 2002, p. 31).

Not surprisingly, the key determinant in these estimations was the foregone income, a product of how long the course took and whether the students worked full-time or not. Those who could continue to work full-time reaped the highest rates of return, as did those who undertook short courses (providing they were also working full-time). On the other hand, those who undertook longer courses requiring full-time studying, had the lowest rates of return (which were actually negative for females). For example, young males working full-time and undertaking skilled vocational qualifications—the typical apprenticeship scenario—had a rate of return of about 38 per cent. If they were in their mid-thirties, the rate of return reached 61 per cent. By contrast, young females who undertook an associate diploma full-time, while working part-time, had negative returns, as did those who didn't work at all but received AUSTUDY. For females, the highest rates of return were for basic vocational studies undertaken part-time while working full-time (Ryan 2002, Table 4, p. 32).

Leigh, 2008

Andrew Leigh's study, one of the few which used the HILDA data,² is interesting because he modelled both hourly wages and annual earnings. He argued that the former reflected productivity effects, while the latter reflected participation effects. Leigh also provided regression estimates which were corrected for 'ability bias', something I discuss in a later section. For the present, the main concern is with the unadjusted estimates, and these are summarised in Table 1.5.

Table 1.5: Earnings premiums, Leigh models (%)

Qualification	Hourly wages	Annual earnings	Comparison group
Grade 10	10	22	Left at end Year 9
Grade 11	10	30	Left at end Year 9
Grade 12	21	57	Left at end Year 9
Certificate I/II	0	-6	No post-school quals †
Certificate III/IV	7	21	No post-school quals †
Diploma/adv dip	13	22	No post-school quals †
Certificate III/IV	-2	-3	No post-school quals ‡
Diploma/adv dip	14	19	No post-school quals ‡
Bachelor degree	35	50	No post-school quals ‡
Graduate dip/cert	39	46	No post-school quals ‡
Masters or doctorate	45	74	No post-school quals ‡

Notes: These are percentage premiums, already converted from regression coefficients by Leigh.

† Comparison group is no post-school qualifications and 11 or fewer years of schooling.

‡ Comparison group is no post-school qualifications but sample now restricted to those with 12 years of schooling.

Source: Tables 2 and 3, (Leigh 2008, pp. 240–241).

Population: Persons aged 25 to 64.

Leigh's results suggested that the the greatest 'productivity gain' was for Year 12 completion and Bachelor degree completion (Leigh 2008, p. 246). The magnitude of the gains were greater when participation effects were taken into account: as is evident most of the figures in the second column of Table 1.5 are considerably higher, especially for early school leavers. On the other hand, lower level VET qualifications conferred no significant increase in earnings, though Certificate III/IV qualifications were a definite advantage for early school leavers. Diplomas conferred a considerable gain for both early school leavers and for school-completers. On the basis of his findings, Leigh argued that 'greater policy attention should be given to increasing school completion rates in Australia' (Leigh 2008, p. 246).

Karmel and Mlotkowski, 2010

This study is not directly comparable to the studies just examined. While the authors also undertook regression modelling of earnings, their framework, population of interest and purpose were quite different. Karmel and Mlotkowski (2010) set out to examine the impact of wages on the decisions made by apprentices and trainees not to continue their courses. They used the estimates from their regression models as inputs into additional modelling on the probability of completing apprenticeships and traineeships. Their population consisted of only apprentices and trainees, rather than the labour force more generally.

The authors began with a certain scepticism of the low figures concerning wages which were routinely shown in the survey data for attitudinal responses to non-completion. As they argued:

Our approach is motivated by an innate distrust of a number of the previous studies, not because they have been undertaken badly but because the usual methodology is to ask individuals about their satisfaction or their reason for not completing. We know that low wages do not feature highly in reasons for not completing an apprenticeship or a trainee-

ship, but we also know that low training wages are the most important source of dissatisfaction. The issue is whether what the individuals say is reflected in actual behaviour—would have completion rates been better if training wages were higher? Or would completion rates be higher if the wages on completion were more attractive? (Karmel and Mlotkowski 2010, pp. 10–11)

While part of their approach entailed modelling wages in a similar fashion to those studies discussed earlier, their approach does not lend itself to direct comparisons because of the specialised target population and the nature of the comparisons. Instead of comparing their subjects of interest, that is apprentices and trainees, with a contrast group—such as school non-completers or those without post-school qualifications—Karmel and Mlotkowski based their comparisons on three different benchmarks which were relevant to apprentices and trainees and which were likely to be informative with regards to course completion. These were what they would earn at each stage in their training; what they might earn in alternative employment; and what they might earn at the end of their contract. For example, in the trades wages increased 17.5 per cent after one year of training; 38.1 per cent after two years; and 62.3 per cent after three years (Karmel and Mlotkowski 2010, p. 18).

In assessing whether it was worthwhile in monetary terms for apprentices and trainees to complete their courses, Karmel and Mlotkowski concluded that a lot hinged on the particular field of studies. In most trade areas, except for hairdressing, the dollar premiums were considerable: as much as \$23,000 in electrotechnology and telecommunications, \$17,000 in construction, and \$14,000 in automotive and engineering. For hairdressers, the sum was a paltry \$632. The story was quite different in the non-trades areas. In some occupations, trainees who completed their courses actually earned less than those who didn't complete. These areas included community and personal service workers (males), sales workers (both) and labourers (females). As Karmel and Mlotkowski concluded, in a comment which has considerable relevance for the theme of human capital theory:

The major point to emerge is that apprenticeships and traineeships are a bit of a mixed bag. The theoretical model in which individuals invest in their skills development by taking a training wage in order to reap the rewards of their investment through a wage premium on completion is certainly the case for some apprenticeships and traineeships. But it is not the case for all, and therefore the value of the training must be questioned for those occupations (Karmel and Mlotkowski 2010, p. 33).

Watson, 2011

In order to illustrate the sensitivity of Mincer-style earnings functions to the underlying assumptions I present some results from modelling the HILDA data for the period 2003 to 2009. I refer to this as 'Watson 2011', for ease of comparison, but it needs to be kept in mind that this is not a separate publication, but part of this report.

The analysis of this HILDA data extends the earlier studies in three main ways. First, the models presented here include a more comprehensive set of explanatory variables, including items related to training and on-the-job learning. Secondly, these models also take account of selection effects, that is, the fact that not all persons in

the sample are observed to be earning (see the useful discussion of this issue in Vella 1998). Finally, this analysis also includes a model which takes account of unobserved heterogeneity, that range of individual and contextual factors which are usually unobserved by researchers but which might influence the results.

There are two major advantages in presenting these results in the context of this discussion. Direct comparisons between the different studies which I have just reviewed are difficult because they use different datasets, different populations, different specifications and different definitions of the variables. For this illustration I have consistency across all of these and can choose to vary just one: the model specification. In this way I can demonstrate just how much the final results hinge on which specification of the model is used. Secondly, I can repeat these specifications taking account of other methodological issues, some of which appear esoteric, but which can influence the final results to a considerable degree. In one sense ordinary least squares (OLS) regression is a 'naive' approach, in the sense that it does not attempt to deal with problems of selection or unobserved heterogeneity. Selection is particularly important in the case of women, since at any one time, a considerable proportion are outside the labour force because of parenting or other caring roles they may have undertaken. Repeated observations on the same individual—as one finds in a longitudinal dataset—are a 'nuisance' with OLS, and one needs to take account of this in calculating the standard errors (as Leigh did above and as I do below). But when used with panel data techniques, these repeated observations become an asset: they allow one to 'net out' the unobserved heterogeneity, those unobserved aspects of the individual and their circumstances which may be confounders because they correlated with both the outcome and some of the predictor variables. So, both panel data methods and selection corrections are useful approaches and help deal with the potential biases which are to be found in OLS models. At the same time, these techniques are not panaceas. In some cases they are quite fragile, and they also rely on various assumptions.

In summary, both the model specification (what variables to include and their 'functional form') and the estimation method (such as ordinary least squares, selection methods, or panel data methods) profoundly influence the final set of results. Even with a single dataset and the same population, there is no simple 'correct' answer to what kind of premium is associated with which particular qualification. Table 1.6 illustrates this quite dramatically. Before discussing these results more fully, I will briefly elaborate on the practicalities of the modelling, since it helps explain what the figures mean.

In practical terms, three of the models use conventional linear regression, that is, ordinary least squares (OLS), and they range from a simple human capital earnings functions in Model 1 (education and experience) through to a fully specified labour market model in model 3. The same specification is repeated in Models 4 to 6 using a Heckman two-step approach to correct for selection. Finally Model 7 is the same as Model 3, but uses panel data methods to fit a random intercept to the model and thereby take account of unobserved heterogeneity. The population consists of employees aged 25 to 64 who reported earnings during the period 2003 to 2009 (current dollars, indexed to 2009). This period was chosen because one of the key training variables only became available from 2003 onward. The full model results are presented in the appendix.

In the early days researchers modelled on-the-job training by recourse to years of labour force experience (Berndt 1991, p. 160), but in recent decades training inform-

ation has been routinely collected by statistical agencies. The Ryan study, discussed earlier, made use of one of the flagship ABS training datasets (the Survey of Training and Education which has been running in one form or another every 4 years since 1989). Yet while this study made use of experience—and also included both job tenure and occupational tenure—it did not make use of any measures of on-the-job training (Ryan 2002, p. 44). In other words, the data allowed it, but the researcher chose to stick with Mincer’s original formulation which emphasised experience.³

The study by Cheung did include a variable for on-job-training, but this was a dummy variable indicating the presence of such training during the interview year, not a measure of the amount of training. It was mainly employed as a control to take account of possible confounding in those models which looked at ability and experience (Cheung 2006, pp. 4.14, 7.3). The same strategy is followed here, with the HILDA variable which indicated whether the respondent had access to training during the interview year included as a dummy variable. Unfortunately, HILDA only began including information on the amount of training from Wave 7 onward, so the main models are limited to the dummy variable.

Finally, the neglected cousin in this whole field of modelling—learning-by-doing—is also included in this modelling by way of a variable which measures the extent to which workers have the opportunity to learn new skills in their jobs. With these additional training variables, as well as an accurate measure of workforce experience, the specifications for the earnings models which follow come closer in spirit to the original human capital theoretical framework than do most others in the field.

Table 1.6: Earnings premiums, Watson model (%)

Highest educational qual	Conventional linear regression			Corrected for selection			Panel
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Males							
Bachelor or above	71.2	44.1	38.9	51.9	29.5	32.9	59.3
Advance diploma, diploma	36.8	23.2	17.7	28.5	16.8	15.0	25.9
Certificate III/IV	20.9	15.8	9.6	14.4	10.3	7.7	13.9
Certificate I/II NFD	-7.4	-7.4	-9.5	-10.3	-10.1	-10.0	-3.6
Year 12	24.4	16.7	11.4	19.3	12.6	9.7	19.9
Females							
Bachelor or above	58.1	33.8	24.5	45.5	21.9	11.4	36.6
Advance diploma, diploma	30.4	18.8	12.6	23.0	11.3	4.2	19.6
Certificate III/IV	13.0	10.6	6.5	7.2	4.3	-0.7	9.1
Certificate I/II NFD	-5.9	-5.9	-8.9	-6.5	-6.6	-10.2	-11.3
Year 12	17.8	12.1	7.0	13.0	7.1	1.7	8.8

Notes: NFD = Certificate Not Further Defined.

Models 1, 4: education and experience only; Model 2,5: occupation added; Model 3,6,7: full specification (other demographic, labour market and training etc); Model 7: same as 3 but with a random intercept.

The comparison group is Year 11 and below.

Outcome variable is the log of annual earnings.

Conventional linear regression fitted by ordinary least squares and selection corrected models fitted using a Heckman approach. Panel model fitted using mixed effects estimation. Full details can be found in the appendix.

All models used pooled data with standard errors (shown in appendix) corrected for repeated observations.

These are percentage premiums, converted from the model coefficients using the formula: $100 * (\text{exponent}(\text{coefficient}) - 1)$.

Source: see Tables A.1 to A.7 in the appendix. Based on HILDA data.

Population: Employees aged 25 to 64 who reported annual earnings, 2003 to 2009.

So, what do the results show? Looking first at males, the earnings premiums for university qualifications, and for diplomas, are quite large: 71 per cent for the former, 37 per cent for the latter. Certificate III/IV carry a premium of about 21 per cent, whilst lower level certificates carry a penalty. For females, the relativities are similar, but of a reduced magnitude: 58 per cent, 30 per cent and 13 per cent respectively.

For males, the addition of occupation (Model 2) makes a large impact: it reduces the university premium by 27 percentage points and the diploma premium by about 14 percentage points. It has a much more modest impact on Certificate III/IV holders in absolute terms (but a considerable impact in relative terms). In the case of females, the reductions are 14 percentage points and 11 percentage points for university and diplomas, and the impact on Certificate III/IV is similar to that for males (in relative terms). These results for occupation are consistent with the view that educational qualifications play a major gate-keeping role, determining who gets into particular occupations. Once there, more highly educated workers earn a certain proportion of their premium by virtue of simply being in that kind of job.

The third model is a more fully specified earnings function, using the rich set of variables available in the HILDA data set. As well as a number of demographic and workplace variables, this full specification includes a control for training, as well as a measure of learning-by-doing, an item rarely included in the human capital models though obviously relevant to the theory. Again, the premium for university qualifications is reduced by the inclusion of these variables, but the drop is modest for males (about 5 percentage points) and somewhat higher for females (about 9 percentage points). The reductions are of a similar order with both diplomas and certificates: small in absolute terms, but larger in relative terms. For example, males with Certificate III/IV drop about 6 percentage points, females drop about 4 percentage points, but for both groups these represent relative declines of about 40 per cent. These results suggest that the 'net' worth of Certificate III/IV qualifications is really very modest indeed.

Models 4 through 6 show how these same set of models change when one uses an estimation procedure that takes account of sample selection bias (a Heckman two-step selection model). The most striking finding is the considerable reduction in the magnitudes of the premiums for all qualifications. There are some interesting gender differences here which are consistent with the view that women's labour force participation is more variable than men's (due to parenting roles, in particular) and that their earnings equations will be more subject to bias if these selection effects are not taken into account. For males, the reductions which adjust for the selection effect are more severe for the pure Mincer-style earnings functions (about a 27 per cent reduction in Model 4 and a 15 per cent reduction in Model 6). For females the reductions are greater for that model which is more fully specified (53 per cent in Model 6 compared with 22 per cent in Model 1).

By way of summarising these findings, it is worth noting that if one ignored the complexity of the labour market, as is the case in neoclassical economic theory, then one would look simply at education and the obvious earnings premium attached. However, loaded into that figure—which might be a premium of 71 per cent—are a range of other factors which influence it. These include which occupation one works in (Model 2) and whether one is more or less likely to be working at all (Models 4 and 5). Finally if one also looks at the host of other influences, admittedly much weaker, then that initial figure of 71 per cent is reduced even further.

In other words, to the practising labour market researcher, the original figure of 71 per cent is considerably biased because of the neglect of these additional regressors. On the other hand, for the labour market researcher concerned about unobserved heterogeneity, and with access to panel data, the unbiased figure is the one shown in Model 7, which is a reduction from the 71 per cent, but of a smaller magnitude (though its worth noting that the reduction for females in the panel model—from 58 per cent to 37 per cent—are of a larger magnitude). Both these labour market researchers might argue the relative merits of their approach, but it is clear that some degree of complexity needs to be incorporated. In this respect, the original estimate is misleading.⁴ For some human capital theorists all of this additional complexity is irrelevant, because neoclassical economic theory suggests most of the differences flowing from this complexity are equalised over time if the labour market is allowed to operate as it should. I pursue this theme more fully in the next section.

What are the implications?

What does this overview of recent research tell us? Does it confirm a particular theoretical approach, or endorse a particular conceptual framework? Before exploring some of these more theoretical issues, it's worth looking at the substantive findings and their policy implications.

It appears indisputable that the original insight—more education equals more earnings—is repeatedly endorsed by many different variations in the regression modelling. But the results are not uniform, shown by the fact that some particular education/training pathways actually leave people worse off. Moreover, where the results are consistent—and this is mainly university qualifications and VET diplomas and higher level certificates—the magnitudes of the earnings premiums are quite varied. The ordering is fairly consistent—with university qualifications worth the most and VET certificates the least—but the actual magnitudes depend on the specifics of the modelling. At their best Certificate III/IV qualifications earn their holders as much as 20 per cent more; at their lowest somewhere under 10 per cent. The contrast here is with those who left school without completing Year 12. When the comparison is made with those who do complete Year 12, the premium can disappear entirely. It is no surprise to find some researchers, such as Leigh, arguing for a policy emphasis on increasing school completion rates.

The negative premiums which are evident in a number of these studies are worth commenting on. These invariably attach to Certificate I/II qualifications. As Karmel suggested in his discussion of negative premiums attached to some completion rates, 'there is apparently little skills acquisition during the traineeship, or if there is skills acquisition the skills are not valued by the labour market over the general work experience obtained during the traineeship' (Karmel and Mlotkowski 2010, p. 33). The results for Certificates I/II qualifications in most of the studies also show negative premiums. These results can be misleading if one is looking at them in any kind of causal framework. In many cases, such certificates are quite workplace specific, and are undertaken by workers who are already in their jobs (such as occupational health and safety training or being instructed in particular methods of work). In other cases, such certificates may play no role in augmenting earnings, but they may play a role in facilitating access to jobs or retaining a job during an organisational restructure. Par-

ticularly in the context of labour market programs, various certificates may provide the entry point to a job which is otherwise unavailable.

This last point is an important one. It is always tempting with regression modelling to assume that associations between explanatory variables and outcome variables are causal in nature. This is an unwarranted assumption. It is interesting to note that the convention in all these studies of earnings functions is to talk about marginal ‘effects’ or ‘premiums’ rather than associations. While not explicitly causal, such terms imply a causal connection. To understand whether qualifications actually increase earnings in a causal sense, one needs a methodology that parallels the experimental controlled studies used elsewhere in the sciences. There are unique problems with the social sciences because experimental studies are quite rare (except in artificial settings like the games theory scenarios studied in experimental economics). In the social sciences, most of the data is observational, and while ‘natural experiments’ have become an important part of the economics research agenda, their use is not widespread (they don’t occur very often). One really needs longitudinal (panel) data to establish causality. For example, one needs to observe an individual’s earnings before they gain a qualification and then to observe their earnings later, after they have gained that qualification. As a control, one needs closely comparable individuals whose earnings are also observed, but who don’t undertake the qualification. Some of the studies of labour market programs have used such a methodology (which comes under the broad heading of matching estimators, with propensity score matching the most commonly employed). The adoption of such approaches has become widespread in recent years and they hold considerable promise (see, for example, Rosenbaum 2002; Dehejia and Wahba 2002; Wooldridge 2002). Interestingly, though, the earnings functions which are the staple of human capital theory remain largely cross-sectional regression studies, the least promising vehicle for establishing any kind of causality.

This discussion of methodology is now pursued further by looking more closely at the interpretation one can place on the findings from these various empirical studies. It’s important to appreciate that changing the specification of the models is not without consequences, both substantively and theoretically. Introducing more predictors, for example, reduces the influence of confounding. As noted in the last section, what one assumed was an association due to educational qualifications, for example, turns out to be an association partly shaped by occupation. As a general rule, a researcher tries to balance parsimony—keeping the number of predictors to a minimum—against the need for a sufficient number of controls to eliminate (as much as possible) the influence of confounding. In this respect, the fuller model specifications discussed in the last section—particularly the Watson 2011 models—are to be preferred, since they have reduced confounding quite substantially. Yet if one wished to implement a human capital earnings function in its purer form, then most of these predictors would be absent. One would need considerable confidence in the underlying theoretical framework, particularly the neoclassical assumption about self-regulating markets, to ignore this methodological impulse to implement a fuller specification and avoid confounding.

Human capital rates of return

What makes this smorgasbord of varied numbers even more complicated is that all of these studies, except one, do not even present human capital rates of return. While beginning with Mincer-style earnings equations, all but one of the studies considered here have overwhelmingly chosen not to complete the human capital journey and to pull out at the point where the earnings premiums are estimated. This is fair enough, estimating these premiums is a worthwhile task after all. But this reluctance to complete the journey (even if it wasn't part of the goal) suggests that undertaking a full human capital analysis is not part of the agenda for many applied researchers.

The reasons for this are not hard to find. Earnings premiums are a straightforward affair: they fit within a conventional regression framework and can be regarded as the equivalent of any other statistical interpretation of model coefficients.⁵ That is, they reflect the partial 'effect' of a particular explanatory variable on a particular outcome variable, with all other predictors held constant. In this regard, they have a fairly unproblematic conceptual and methodological status within statistics. This is not to say there won't be debates about the model specifications: simply comparing how a health researcher and an econometrician go about fitting a regression model shows that there is considerable disciplinary diversity here. Nor are all the issues settled within one discipline, illustrated in Blinder's comments on the debates about the functional form for earnings equations (Blinder 1976).

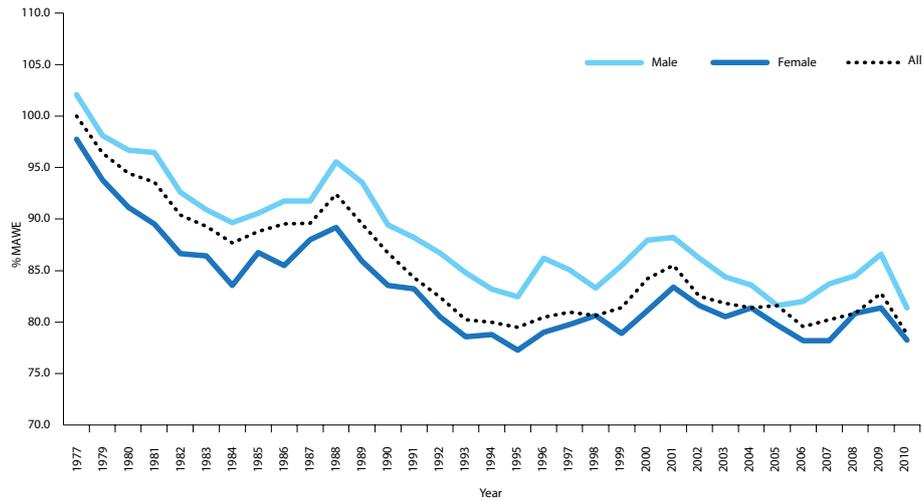
While the coefficients in these earnings models have this relatively simple statistical ontology, the same cannot be said for the larger enterprise of human capital rates of return. It is not just a problem of methodology or data, but a theoretical dilemma. I gestured towards this earlier in my comments about whether one attempts to model labour market complexity as fully as possible, or whether one assumes the complexity away.

By way of a metaphor, the ground upon which the enterprise of calculating rates of returns is constructed is already wobbly before the first footings are poured. Add to this the wobbly construction itself the host of assumptions needed to turn these premiums into rates of return and the final edifice become even more shaky. Consider the host of assumptions required to calculate private rates of return. Not only are there aspects of the life-course—whether the person is young or middle-aged—but there are also assumptions about labour force attachment—whether they work full-time or part-time. And then, of course, there are the other costs involved: course fees and so forth. Finally, there is the future: making assumptions about their future earnings streams, including the longevity of their labour force attachment.

In terms of the future, one could make various assumptions using historical data, but how reliable would that be, given that future earnings are likely to depend on a large range of factors? Take, for example, the earnings of graduates, those whom human capital theory should come closest to approximating. Not only has there been a long-term decline in graduate starting salaries, but the fall has been a very bumpy one (as shown in Figure 1.1). As for labour force participation rates among mature age workers, that too has shown great volatility. While the trend towards lower rates for workers with lower levels of education has been consistent over the last two decades—as traditional blue-collar jobs have shrunk—the pattern among other categories of worker has shifted erratically. Patterns of early retirement have changed as government incentives to work longer have been rolled out. Plans for pushing out the pension

age will no doubt consolidate this trend, as will the large losses in superannuation savings which took place during the global financial crisis. In summary, historical data is unlikely to provide a reliable guide for calculating the quantum of either future earnings or future labour force attachment. The upshot of this is that there is too much complexity to arrive at any simple formulation of private rates of return from human capital ‘investments’.

Figure 1.1: Graduate salaries relative to average weekly earnings 1977–2010



Notes: Shows median starting salaries relative to annual rate of full-time male average weekly earnings.

Source: Graduate Careers Australia (2010, p. 9).

The results of Ryan’s study illustrate this problem where the mode of presentation becomes: a person with certain characteristics can expect certain rates of return. This approach of constructing cameos resembles the economic modelling done by NATSEM when assessing the impact of government policies on particular types of household, such as single parents or retired couples. This is certainly a useful way to present findings, and is common in many statistical fields as a way of presenting complicated results (such as the estimates from non-linear regression models where the interpretation of the coefficients is not self-explanatory). However, when it comes to arbitrating between rival theories, how useful are such findings? Results like these do not really help in either confirming or refuting particular theoretical frameworks. In some respects, the assumptions needed to operationalise the calculation of the rates of return becomes almost circular. Thus Ryan finds, for example, that people who work full-time while they study earn the highest rate of return, as do people who undertake short courses. This follows, almost axiomatically, from the assumptions used in the calculation, particularly the primacy given to foregone income.

Does the absence of private rates of return in most of these studies, and the circularity in the one study which did derive such rates, suggest that human capital theory has really very little to contribute to our understanding of education and earnings? To answer this we need to think about how knowledge advances in a scientific fashion. From a Popperian perspective, one should be able to test the falsifiability of theoretical precepts. Awkward results should not be easily accommodated, glossed over, or just ignored. Circularity in reasoning should be tempered. In his overview of human cap-

ital theory, Blaug adopted such a perspective and suggested that human capital theory had become a 'degenerate research program':

its rate-of-return calculations repeatedly turn up significant, unexplained differences in the yields of investment in different types of human capital, but its schooling-model explanation of the distribution of earnings nevertheless goes on blithely assuming that all rates of return to human-capital formation are equalized at the margin. Worse still, is the persistent resort to ad hoc auxiliary assumptions to account for every perverse result, culminating in a certain tendency to mindlessly grind out the same calculation with a new set of data, which are typical signs of degeneration in a scientific research program (Blaug 1976, p. 849).

For a local example of this dilemma we do not have to look far. The Preston study, discussed above, illustrates the problem quite clearly. Preston (1997, p. 71) asks at the outset: 'human capital theory remains a dominant framework for the study of wage determination. Does habit give human capital theory such status?' She finds that her results are 'consistent with earlier studies' (as one would expect from the self-replicating nature of the this modelling exercise) but she also finds that industry is a significant determinant of earnings, as is occupation. Gender earnings differences also appear to be entrenched. All these findings challenge the core of human capital theory, which assumes that competitive labour markets will diminish the influence of such factors.

An obvious response might be to acknowledge that labour markets are not like other markets, and prior neo-classical expectations about competition, marginal returns, equilibrium, and so forth, are simply not appropriate in this domain. The other response is to stay wedded to the precepts of human capital theory and look for 'ad hoc auxiliary assumptions'. In looking at a decade long comparison (1981 to 1991) in wage structures, Preston concludes:

Overall the inter-decade analysis suggests that either competitive wage forces are sluggish to adjust or that there is market failure. In other words, wages will not adjust to competitive levels as predicted by neoclassical wage theory because of persistent *imperfections* or normative forces, such as trade unions, industrial tribunals and discrimination (Preston 1997, p. 72).

In other words, the real world itself has failed to match the world prescribed by human capital theory. In the same breath, Preston concludes that human capital theory is 'unable to explain significant and persistent inter-industry, inter-occupational and gender wage differences' but that the theory is 'a useful framework for the study of wage determination in Australia' (Preston 1997, p. 73).

1.3 Screening theory

The other aspect of scientific progress—alongside the falsification principle—is the notion that rival theories play an important role in assessing the worth of a particular theoretical framework. In the case of human capital theory that rival has mostly taken the form of screening theory, though other positions are also plausible. Screening theory has been more widespread, partly because it shares the methodological individualism of human capital theory and partly because it accommodates the same empirical findings.

In the conclusion of his overview, written in the mid-1970s, Blaug expected rather optimistically that human capital theory would slowly fade away and be replaced by screening theory:

In time, the screening hypothesis will be seen to have marked a turning point in the “human investment revolution in economic thought”, a turning point to a richer, still more comprehensive view of the sequential lifecycle choices of individuals (Blaug 1976, p. 850).

Blaug clearly didn't see what was around the corner, with the resurgence of neoliberalism during the 1980s giving a boost to neoclassical economic theories in all their different localities. As noted earlier in my summary of Marginson's overview, it was during this decade that the OECD's embrace of human capital theory assisted its enthusiastic adoption in policy circles. However, Blaug was right in one sense: screening theory did not go away. But within the new orthodoxy, it became the one absorbed, rather than doing the absorbing.

I mentioned earlier that the notion of productivity is at the core of the human capital framework: education boosts an individual's productivity and it is the marginal productivity of the worker which the employer rewards with higher wages. In the next chapter I scrutinise the concept of productivity, to see if this nexus actually makes sense. In this chapter—keeping the focus on education and earnings—the productivity issue is also relevant to screening theory, but mainly by virtue of its dismissal. For advocates of screening theory, education plays a minor role in augmenting an individual's productivity. In the classic formulation of the theory, by Kenneth Arrow, the ‘filtering’ role is emphasised:

Higher education ...contributes in no way to superior economic performance; it increases neither cognition nor socialization. Instead, higher education serves as a screening device, in that it sorts out individuals of differing abilities, thereby conveying information to the purchasers of labor (Arrow 1973, p. 194).

What the employer pays extra for are the ‘signals’ which educational qualifications indicate. Given the uncertainty about the future work performance of a prospective employee, the employer can use qualifications as a screening device to minimise the risk of employing a less suitable employee. Within this perspective, less educated individuals may be just as able as educated individuals to perform the job, but they are screened out on the basis of educational qualifications. Hence the notion of a ‘sheep-skin effect’: the credential itself signals something to the employer. It may be that

the employer assumes the more qualified person is more able: after all, they have persisted with their education. It may be that they assume the more qualified person will learn more quickly, particularly if new technology is part of the workplace. While these all of these assumptions have productivity implications, screening theory argues that they only operate indirectly. The employer primarily focuses on the signal which the qualification sends and sorts out job applicants accordingly. In the real world, of course, the situation is more complex. As well as personal interviews and references, many employers administer personality tests and other screening devices, rather than relying entirely on educational qualifications.

In this short summary, a number of key categories have emerged: signalling, screening, filtering, sorting and sheepskin effects. Among labour market researchers some of these categories also form the basis of different models to be tested (see the discussion in Cheung 2006), but for practical purposes they all amount to the same thing: a rejection of the notion that education necessarily embodies enhanced productivity and is rewarded by employers for that reason. Looking at it from the perspective of screening theory, it matters little to an individual with a degree whether their greater earning power comes from their productivity or from their status as a credential holder. Their 'individual rate of return' will not change whichever theory is more credible. But for society more broadly, there are major implications in the challenge posed by screening theory: the 'social rate of return' will differ considerably if one theory is more credible than the other. Basically, for the advocates of screening theory, a major social investment in education may not be warranted if workforce productivity is not significantly enhanced and the main effect of such spending is to simply increase the supply of credentials within the labour market.

Is it difficult for researchers to arbitrate between these two rival theories? One of the problems is that the same empirical findings—along the lines of the studies examined in the last section—can be used to justify the logic of both theories. As Berndt (1991) puts it:

It would of course be very useful if one could employ historical data and econometric methods to discriminate between the human capital and screening theories of education ... The essential problem, however, is that since the more able will self-select themselves into educational degree programs regardless of which theory is correct, in some sense the two theories are *observationally equivalent*, and so it is difficult if not impossible to distinguish between them using historical data (1991, p. 158) (Emphasis added).

The Cheung study aimed to isolate the sheepskin affect, which is a core assumption of screening theory, by distinguishing years of education from qualifications. However, this approach does not resolve this problem of self-selection and it relies on human capital assumptions about productivity and earnings, a link which is highly problematic (and which I will be exploring later in this report).

Does the problem simply reduce to a theoretical, and even ideological, choice? If one finds the precepts of neoclassical economics convincing, and if one thinks that the human capital framework is useful, then it seems likely that the empirical studies can be mobilised to endorse this position. On the other hand, if the world of neoclassical economics is regarded with suspicion, and if all the tenuous and ad hoc assumptions needed to keep human capital theory afloat are seen as distasteful, then siding with

screening theory is an obvious choice. There are of course other options, and a theory of wage determination which goes beyond both these perspectives is presented in the next chapter. For the moment it is worth looking more closely at a number of other educational issues which have not yet been discussed, but which also raise troubling questions. They represent some of the holes which human capital theory has yet to satisfactorily fill.

1.4 Holes to be filled

In discussing the problem of moving from wage premiums to rates of return I emphasised the additional complexity involved, particularly the range of assumptions required and the paucity of relevant data items. That discussion was not meant to imply that all is well with the more modest task of fitting earnings functions as statistical models. In fact, even for labour market researchers with no interest in human capital theory, there are a range of practical and theoretical problems which modelling earnings brings to the surface. For these researchers these are difficult but interesting problems; for human capital theorists these jeopardise the credibility of their framework. In this section I look at two of the more troublesome aspects: various types of measurement error and issues of ability and heterogeneity.

Measurement error

The earnings premiums discussed in the earlier section, as well as the rates of return, are always presented as point estimates. While the standard errors are usually presented with the model results, there is little attention given to the margin of error around these estimates. Confidence intervals are rarely discussed in this literature, something often encouraged by policy-makers who generally prefer a rhetorically powerful single figure. The cautionary disposition of the statistician, particularly those with a Bayesian inclination, towards emphasising uncertainty in all modelling, is usually absent in this environment.

This uncertainty represents the inevitable error which arises from the modelling exercise, of trying to simplify the complexity of the real world and represent it in a mathematically tractable fashion. We have no choice in this matter, though we can draw comfort from the ongoing refinements in statistical methods which make the identification of uncertainty a source for considerable insights.

When it comes to the measurement error to be found the data items, earnings functions suffer more than their share. The outcome variable—earnings—is notoriously difficult to collect and to standardise. As Berndt (1991, p. 160) observed ‘the use of wage rate data in empirical studies of wage determination may reveal only a portion of the total compensation differentials among workers.’ A host of issues—salary sacrificing, fringe benefits, overtime, penalty rates, shift loadings—make the collection of this item problematic for not just salaried employees, but also for those on hourly rates. Attempts to standardise to an hourly rate run into problems with managers and professionals. The open-ended nature of their labour process—the fact that they are task-oriented rather than time-oriented—can lead to severely deflated hourly earnings if one uses their ‘usual weekly hours’ as the denominator in the calculation of the hourly rate. For other segments of the labour market (such as casuals) there may be

no reliable measure of ‘usual weekly hours’, or the real hours may not be captured in the data (such as those doing unpaid overtime).

None of this is meant to suggest that the final research results are ‘dodgy’ or ‘suspect’. After all, many different studies, using data sets of quite different quality, often come up with consistent results, suggesting a certain reliability in the overall research agenda. To some extent this reflects a uniformity of approach, but it also suggests that there are likely to be stable patterns in the real world which are being mapped, albeit roughly, by all this furious modelling. What really matters is the spurious accuracy attached to economic modelling, the neglect of this dimension of uncertainty which follows from generally presenting point estimates and relegating difficult data decisions to footnotes or appendices.

Finally, there is another kind of error we need to be aware of, one which is not acknowledged by presenting confidence intervals. This error is more of a logical, or even theoretical kind, and arises from attempting to operationalise particular concepts, categories which may be valuable for public policy reasons but which defy easy definition or deny easy collection. Ability and productivity are two of the most intractable of these. I deal with the latter in the next chapter. The former is addressed in the following section.

Ability and heterogeneity

When it comes the human capital debate, ‘ability’—however one defines it—is problematic for statistical reasons. As Berndt (1991, p. 166) notes, ability is likely to be correlated with schooling, so omitting measures of ability are likely to bias the regression estimates for educational returns. In other words, the earnings premiums are likely to be inflated by the omission of an ability variable. There have been a number of strategies employed to deal with this: using intelligence test data as a measure of intelligence; using data on identical twins; and using panel data.

These are all pragmatic responses, and sometimes quite crudely implemented. Drawing on the results of research on twins, Leigh, for example, suggested that the extent of upwards bias was likely to be in the range of 10 to 28 per cent (Leigh 2008, p. 235). Consequently, he provided two sets of results from his modelling of earnings premiums: the straight estimates and another set deflated by 10 per cent to adjust for this ability bias (2008, pp. 240, 241). At best this represents a gesture towards the problem, but not a serious engagement with it.

However, in this area one encounters more than just problems of data. The concept of ‘ability’ is central to the lexicon of educators, but is notoriously difficult to operationalise. It is also beset with conceptual confusion produced by crude dichotomies between ‘nature’ and ‘nurture’. One of the longest running debates in the sociology of education concerns the rival contributions made to educational outcomes by ‘socio-economic status’ and ‘ability’. Using the 1995 cohort from the Longitudinal Survey of Australian Youth (LSAY), Marks and McMillan (2003) made use of year 9 test school test scores in their modelling. They concluded that:

Ability is an important influence on educational outcomes and thus indirectly influences occupational destinations. Its effects cannot be attributed to socio-economic background or other factors such as cultural cap-

ital. Its effects on educational outcomes tend to be stronger than that for socio-economic background (Marks and McMillan 2003, p. 467).

Yet the notion that school test results taken in Year 9 are a 'neutral' indication of innate ability flies in the face of decades of neurological and sociological research. Both fields of endeavour have shown that the social environment of a child's upbringing is fundamental to the brain's development, as well as being formative of all the other personal attributes (inclination and enthusiasm, for example) which come to be designated ability. Even twin studies, a favourite device for some researchers in this field, cannot fully take account of this fluidity in a child's environment. The myriad interactions between a child and the world, from birth onwards (and even beforehand) shape the brain in ways still not fully understood by scientists.⁶ Economists had for many years been sceptical of the role of early childhood education in shaping long-term outcomes (Barnett 1992), but recent research seems to suggest that its importance for long-term social and economic benefits is unambiguous (Bartik 2008; Bartik 2009). The debate over what constitutes human ability is far from settled.

The study by Cheung (2006) discussed above, also employed the 1995 cohort of the LSAY used by Marks and McMillan (2003). Cheung used the LSAY test scores, in conjunction with information on the parents' education, as part of an analysis of 'employer learning' in the labour market. They were both viewed as measures of a worker's ability, which Cheung posited were observed by the researcher, but not by the employer. This provided him with a useful test of sorting theories of education vis-à-vis human capital theory. If employers could learn more about the 'harder-to-observe aspects of ability' over time, then they would attach less weight to 'easy-to-observe variables such as education' (2006, p. 7.1). The test for this thesis entailed interacting ability (the test score variable and the parental education variable) with experience to see if earnings increased, the assumption being that such an increase represented employer learning expressed through higher remuneration.

Cheung's results for the test scores showed little support for the thesis of employer learning: 'the estimates [for the baseline model] confirm that the test score indeed captures information about ability that is valued by employers, the estimate [for the interaction model] suggests that this information is largely already observed by employers at the time of labour market entry' (2006, p. 7.6). On the other hand, results for the parental education variable showed the opposite result, though the estimates were only statistically significant for males, not females. Having set out with two measures of ability, and finding only one of them to be supportive of the thesis, Cheung concluded his analysis by arguing that while both measures of ability were valued by employers, 'the information contained in the test score is already observed by employers at the time of labour market entry' while the 'the information contained in the parental education variable is initially more difficult for employers to observe' (2006, p. 7.11–7.12).

Without commenting further on the range of assumptions that are needed for this overall analysis to make sense, it's clear that Cheung has not only equated employer learning with workers' wages, but he has also combined into one overall notion of ability—which he also equates with 'worker characteristics'—the two aspects of the LSAY dataset which are usually counterposed in sociology: scholastic ability and socio-economic background. Ability, even in this hybrid guise, is unproblematically taken as having considerable relevance in the labour market. After all, human capital

theory posits a link between schooling and working in which scholastic ability and productivity are presumed to go hand-in-hand. As Cheung concludes, even if sorting plays a role in who gets a job and how much they earn at the outset, ‘the finding of employer learning implies that the effect of sorting will ultimately be undone—and that wages will eventually converge to actual productivity’ (2006, p. 7.12).

But what if worker performance and scholastic ability have no necessary connection? As Arrow argued when he questioned the relevance of IQ tests:

...unfortunately these ability measures are wrong in principle. Typically, they are measures of intelligence; but “ability” in the relevant sense means the ability to produce goods, and there is simply no empirical reason to expect more than a mild correlation between productive ability and intelligence as measured on tests. Intelligence tests are designed to predict scholastic success, and this is a function they perform well. But there is considerable evidence in direct studies of productivity (e.g., by the U.S. Navy) that ability to pass tests is weakly related to ability to perform specific productive tasks. It is only the latter ability that is relevant here (Arrow 1973, pp. 214–215).

To take it further, one could argue that the issue goes beyond intelligence tests and school test scores of mathematics or reading to the more fundamental issue of what constitutes human ability in the broadest sense. In his assessment of pre-school compensatory programs Barnett argued:

The finding that IQ test scores do not adequately capture the effects of preschool education on cognitive human capital suggests that economists risk serious errors if they do not account for the complexities of cognitive abilities in research on human capital. It does not appear to be safe to assume that the contributions of schools (or families) to cognitive human capital can be precisely described by the term “intelligence” or “ability” or adequately measured by whatever test scores happen to be available. It should not be assumed that scores from different types of cognitive tests are comparable. Efforts to elaborate the theoretical definition of human capital and greater attention to the correspondence between theoretical constructs and measures might significantly improve human capital studies (Barnett 1992, p. 306).

And this cautious view comes from an economist working within the human capital framework.

One can, of course, remain agnostic and avoid specifically pinning down ability. One can consign it to the ‘bundle’ of attributes which make up unobserved heterogeneity, thereby allowing personal attributes like inclination, enthusiasm, and other cognitive capacities to simply be regarded as a diffuse residual. In a way, this is what the econometrician’s terminology of ‘ability and motivation’ points towards. There are well-trodden methods for dealing with the potential confounding influence of this residual—its likely correlation with both earnings and schooling—by using longitudinal data on the same individuals. One strategy open to researchers—and possible with the HILDA data which Leigh used, but not pursued by him—is to exploit the panel nature of such data and directly model unobserved heterogeneity, that is, the

unobserved attributes of individuals which are likely to be confounders. This was the estimation method used for the final model in Watson 2011 above.⁷

These panel data approaches are certainly a promising avenue for moving beyond the simplicity of the earlier studies and the increasing availability of good micro-economic datasets like HILDA make this a manageable task. However, there is still the important issue of how one interprets the model results. Removing the confounding induced by unobserved heterogeneity is clearly worthwhile, but what does this actually mean in broader labour market terms. After all, within mainstream economics unobserved heterogeneity is invariably individualised and this has implications for how the results of modelling earnings are subsequently interpreted. As Watson (2010) argued in his analysis of low paid employment:

...‘individual heterogeneity’ is not about *personal* features of the individual. Rather this concept refers to features unique to individual observations in the dataset which make it likely that any analysis of sample means will not adequately capture the processes at work. Whereas observed heterogeneity can be controlled for in the regression analysis using variables in the dataset, unobserved heterogeneity (by definition) is not able to be assessed in the same way. It is important to keep in mind that unobserved heterogeneity may refer to both personal aspects of a low paid worker—such as their social skills—as well as contextual aspects of their working life—such as the presence of discrimination in the workplace—and also features of the local labour market—such as poor transport options in certain suburbs. While the analysis does not allow us to pinpoint which combination of these kinds of things are at work, it’s important to avoid the narrow ‘ability and motivation’ label which is commonly employed (Watson 2010, p. 30).

To grasp this structural and contextual dimension of the labour market requires a different orientation to that provided by the methodological individualism of neo-classical economics. The next chapter will discuss this in greater detail.

2. Earnings and the labour market

2.1 Earnings and productivity

Productivity in theory

We saw in the last chapter that for human capital theorists the neoclassical maxim that earnings represent productivity is taken for granted. More highly educated individuals earn more—and the empirical research consistently confirms this—because their marginal productivity is higher and their earnings are evidence for this. This last link in the chain is never investigated, however, but merely asserted. For neoclassical economists, marginal productivity and earnings are virtually synonyms, and one finds this logical equivalence regularly asserted in any number of empirical studies on the labour market.

Why is this so? Neoclassical economics is a microeconomic perspective which takes as its starting point the decisions made by firms in competitive markets. The goal of such firms is profit maximisation, and efforts to increase the output of the firm in pursuit of this goal are subject to diminishing returns in the short term because inputs like capital are fixed. According to this perspective, firms can hire additional workers in order to increase output, but the ‘law of diminishing returns’ means that each additional worker who is hired produces less output than the worker hired prior to them. Thus the firm keeps hiring workers ‘up until the point at which the wage equals the amount for which ... the last worker’s additional output can be sold’ (Keen 2001, p. 112). Within this framework, a worker’s marginal productivity is equated with the firm’s marginal revenue product and the wages they are paid will reflect this (Keen 2001, p. 114).

The maxim that more productive workers earn more has a common-sense ring to it. But this is only because the term ‘productive’ is used so loosely. In reality it encompasses a range of requirements which employers look for in designing tasks and the bundle of attributes which they value in the person assigned to those tasks. In some tasks diligence will be required, in others it will be close attention to detail, while in others it might be a capacity to endure boredom. Where customers are directly involved, as in most service sector jobs, communication skills will be valued. And in most workplaces, irrespective of the tasks, attributes like being co-operative will be valued. It is the combination of these various attributes which come to mind when one uses the word productive in this common-sense way.

What employers look for in a worker is an important theme in this chapter, and I look in more detail at this below. For the moment, it’s worth noting that if we wish to use the concept of ‘productive’ in its more precise sense—in which the wage equates

to the worker's marginal productivity—we immediately run into both conceptual and empirical difficulties. Exploring these is the purpose of the remainder of this section.

Critics of neoclassical economics can point out that there are more convincing accounts of why wages differ in the labour market, such as efficiency wage theory or segmented labour market theory. These both emphasise, to varying degrees, the importance of the relative bargaining power of the employer and the worker. Historically, this recognition has always been at the heart of the institutional framework for wage determination in Australia, whereby employers and workers (through their collective voice) sat down to negotiate wage outcomes. Despite this reality, the neoclassical microeconomic theory of wages remains ascendant in academic circles and in many public policy debates concerning the labour market. It is certainly at the forefront of the debates which connect labour markets with education, debates in which human capital theory sets the ground rules.

Does the concept of marginal productivity actually make sense? and can it be measured? The latter is an important consideration. In an era of evidence-based policy making, in which quantitative evidence counts the most, it must surely be problematic if a key concept cannot be accurately measured. Increasingly, most major public policy initiatives are accompanied by volumes of economic modelling, such as reports from the Productivity Commission or groups like Access Economics. The cynic might suggest that these are window dressing for decisions made on political or sectional-interest grounds. But if we take the democratic process seriously, as the optimum case in which good public policy-making is based upon serious research and reflection, then this unpacking exercise is worthwhile.

Writing a time when he still subscribed more confidently to human capital theory, Mark Blaug outlined one of the major difficulties which the simple marginal productivity thesis faced:

... the assertion that education renders people more productive is liable to be misunderstood. It seems to imply, first of all, that labour as a factor of production makes a definite contribution to output which can be distinguished without much difficulty from the contribution of other factors, such as management and capital equipment. But of course all factors of production participate jointly in the productive process and the separate contributions of each to final output can only be assessed at "the margin", that is, by holding constant the quantity and quality of all the other factors.

Furthermore, there are many margins: every type of machine has its own margin and, as for labour, there is a margin for each distinct attribute that enters into the hiring function of employers. A minimum list of these attributes would cover age, native ability, achievement drive, work experience, possession of specific skills, educational attainments, and on-the-job or in-plant training received. An employer cannot normally hire one of these attributes by itself, since each worker is a particular bundle of them, but he can acquire them indirectly by choosing different combinations of workers. *In that sense, labour as a factor of production can be viewed as a vector of attributes, each of which has a distinct price.* Thus, the proposition that "education renders people more productive" must be strictly read as "education makes the marginal worker more productive when he is furnished with the same quantity and quality of management,

capital equipment and complement of all other workers as before” (Blaug 1972, p. 55) (emphasis added).

These important qualifications highlight the reason some theorists consider that productivity ‘is a function of jobs, not people’ (Carnoy, cited in Marginson 1993, p. 53). Blaug’s re-formulation of the problem still leaves intact the underlying theory of marginal productivity: it simply shows that its realisation is more complicated than the simplistic exposition found in most economics textbooks. A more fundamental criticism comes from the work of Piero Sraffa, who convincingly showed that a firm’s marginal returns do not in fact diminish. Writing as long ago as 1926, Sraffa argued:

Business men, who regard themselves as being subject to competitive conditions, would consider absurd the assertion that the limit to their production is to be found in the internal conditions of production in their firm, which do not permit of the production of a greater quantity without an increase in cost. The chief obstacle against which they have to contend when they want gradually to increase their production does not lie in the cost of production—which, indeed, generally favours them in that direction—but in the difficulty of selling the larger quantity of goods without reducing the price, or without having to face increased marketing expenses (Sraffa 1926, p. 543).

This insight has a direct bearing on neoclassical arguments about employment and wages. As Keen argues ‘with a flat production function, the marginal product of labour will be constant, and it will *never* intersect the real wage. The output of the firm then can’t be explained by the cost of employing labour’ (Keen 2001, p. 77). For Keen the implications are far-reaching: ‘neoclassical economics simply cannot explain anything: neither the level of employment, nor output, nor, ultimately, what determines the real wage’ (2001, p. 77). As Joan Robinson put it, more bluntly, in her review of Sraffa’s 1960 book: ‘the marginal productivity theory of distribution is all bosh’ (Robinson 1961, p. 58). Pursuing this debate further is beyond the scope of this report. At this point, we might register these conceptual difficulties, but then ask the pertinent question: what happens when we operationalise the concept of marginal productivity by looking at the data collected in the real economy.

Productivity in practice

If we move to the level of the economy, and the workforce more broadly, it’s notable that the potential reach of this theory of marginal productivity and wages is quite limited. For a start, the public sector, which constitutes more than 20 per cent of employment, lies outside this framework altogether since there is no profit-maximising dynamic at work here.⁸ Next are the self-employed, who make up about 16 per cent of the workforce, a group who are not part of any employment relationship. This means that, at the outset, some 36 per cent of the labour force are outside the reach of this theory of marginal productivity and wages.

In practice, the number of workers who fall outside this theoretical framework is much greater. Looking at those industries which are unambiguously widget-makers,

that is, engaged in producing physical output, we can sum the proportions of employees in each: agriculture, forestry and fishing (1.2 per cent); mining (1.6 per cent); manufacturing (9.2 per cent); and construction (6.5 per cent).⁹ Taken together, this group constitutes just under 20 per cent of the workforce. Moreover, because these numbers are based on an industry categorisation, they include a range of occupations in which the link to marginal productivity is largely irrelevant. In accounting terms, these are jobs which form part of the business overheads, and constitute fixed costs which must be met irrespective of production levels. So the 20 per cent figure is probably an overestimate of how many workers this linkage between marginal productivity and wages actually applies to.

In summary, the empirical reach of the original theory of marginal productivity is quite limited. When it comes to actually measuring it in a practical fashion, which means at an industry level, the concept under scrutiny is not ‘marginal productivity’ but simply ‘productivity’. The basis for most published estimates of productivity in Australia involve collecting data on these simple measures: labour productivity, which divides outputs by an index of labour input; capital productivity, which divides output by an index of capital input; and multifactor productivity (MFP), which divides output by both labour and capital inputs combined. Output can be measured as gross product, or as gross value added (which takes account of intermediate costs) and labour inputs can be measured by the number of hours worked. At this fairly crude level, qualitative variability in the workforce—in terms of education or experience—is ignored.

Even estimating these fairly crude measures of productivity is not a simple matter. For example, to come up with its experimental industry-level measures, the ABS relies on a number of assumptions and methodological simplifications. The exercise assumes that capital utilisation does not change, that each hour of labour is fully utilised and that economies of scale cannot be identified (ABS 2007, p. viii). When it comes to labour productivity, operationalising this is problematic: one obvious limitation is that one is trying to attribute to one factor of production ‘changes in output attributable to all factors of production’ (ABS 2007, p. 1):

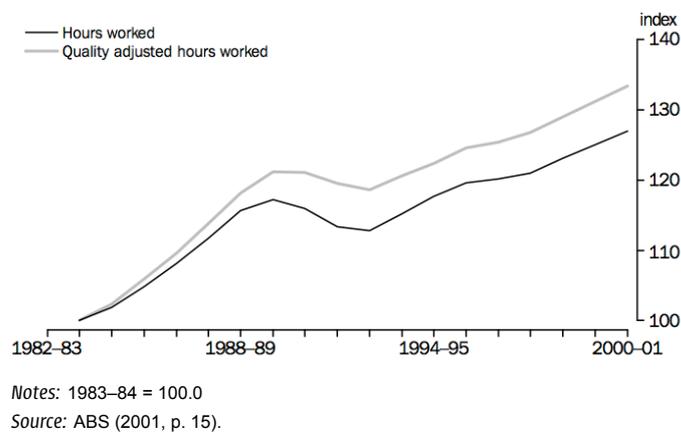
...the effects of technical progress, improvements in management practices and economies of scale, could affect measures of both capital and labour productivity. Also, a labour productivity measure takes no account of the amount of capital available to labour, or how this amount changes over time (ABS 2007, p. 1).

What are the implications of these measurement issues? We start this journey at the micro level of the firm, with a labour force differentiated by education and experience. Its marginal revenues vary accordingly, and it also pays differentiated wages accordingly. We arrive at the macro destination, either industry-wide or economy-wide, but the labour force is no longer differentiated by either education or experience. All that enters the equation is the volume of hours worked. Interestingly, it’s hard to displace the cameo of the more ‘productive’ worker at the firm level, and one finds commentaries which accompany discussions of macro trends in productivity falling back on speculation about quality. In noting the increased volume of hours in mining since 2000-01, the ABS authors noted that this had not been accompanied by a significant growth in employment and suggested ‘These new workers may not be as

productive as incumbent workers and their output could be lower. Hence measured productivity might also be lower' (ABS 2007, p. 28).

Australian statisticians have tried to move beyond crude measures of productivity. Experimental estimates of labour input, which take account of changes in the quality of labour, have been developed by the ABS (ABS 2001, pp. 12–19). Figure 2.1 shows estimates for the period 1983 to 2001 and suggests that quality adjusted hours worked rose at a faster rate than unadjusted hours (1.6 per cent per year compared with 1.3 per cent.) This was more so for the earlier period, upto about 1995. Since then the growth rate of the quality-adjusted hours only exceeded the unadjusted series by about 0.15 percentage points. The ABS still regards this approach as experimental, cautioning that more work is needed for the results to be regarded as plausible.

Figure 2.1: Indexes of labour input, Existing & Experimental (%)



At a conceptual level, one is struck yet again by that familiar circularity which is so common in economics. While the quality adjustment is a sophisticated process, at its heart is the use of hourly wage rates to differentiate the quality of labour.¹⁰ The linkage back to the micro level is complete: why do some workers earn more? Because they are more productive. How do we measure their productivity? We look at what they earn.

In essence, conventional measures of productivity at the macro level are nothing more than ratios of outputs to inputs. Yet the terminology of 'productivity' carries with it that common-sense connotation of improved performance, of 'being more productive'. It represents a fascinating sleight of hand which appears to provide a straight-forward endorsement of this theory of the firm. What is happening here is a shift from the cosy image of the worker who is more highly skilled, or educated or experienced—an image which gives the textbook cameo of the firm some kind of obvious appeal—to the simple accounting entry of the volume of hours worked in an industry.

If the number of hours required to produce the same output falls, that must be a good thing, surely? This simple question recalls the fantasising about the coming 'age of leisure' which prevailed in the early 1970s, before the culture of long hours settled over the Australian workforce. If the number of hours are reduced for the same output, then surely workers are being more productive? At this point, a brief historical excursion into the workplaces of the 1990s is worthwhile, an excursion which helps

explain the increase in productivity during the 1990s. After averaging a growth rate of 1.5 per cent per annum during the 1980s, the measure known as 'gross value added per hour worked' rose at an annual rate of 2.3 per cent during the 1990s, before dropping back to 1.4 per cent during the 2000s (see spreadsheet ABS 2010, Table 15).

Enterprise bargaining in Australia began in the early 1990s under the Hawke-Keating governments (ACIRRT 1999, Ch. 3). While this new phase of industrial relations bargaining replaced the centralised system of wage fixing which had prevailed under the Accord, it did not entirely displace the old arrangements, with the Award system still operating for large segments of the workforce, particularly those in lower paid occupations. While Awards persist to this day, they are a shadow of their former selves, and largely represent those segments of the workforce who are not in an effective bargaining position vis-à-vis their employers (hence the language of annual 'safety net' wage adjustments). The core insight into what the 'transformation of industrial relations' (in the words of one author) really meant can be found by looking at the 1990s and at what happened with enterprise bargaining. While many in the labour movement feared that employers would make use of the early 1990s recession, and the opportunity of enterprise bargaining, to drive down wages, the real action took place around hours of work. In the period from 1992 to 2002, an average of 82 per cent of registered enterprise agreements covered the issue of working hours. By contrast, only 55 per cent of agreements dealt with training issues, and only 42 per cent dealt with occupational health and safety issues (Watson et al. 2003, p. 85).

Employers took the opportunity provided by enterprise bargaining to restructure the labour process: to eliminate 'dead-time', to end demarcations, to reduce 'over-staffing', to increase the length of shifts, to reduce skilled-to-unskilled staffing ratios, to introduce new technology and to undertake organisational restructuring. Overall, these changes represented a range of strategies to provide employers with both 'numerical flexibility' (the hiring and firing workers) and 'functional flexibility' (the allocation of task to employees). The job shedding which resulted, in conjunction with the growth in 'multitasking', led to a widespread pattern of work intensification, that is, working harder during each hour at work. While the mantra 'working smarter, not harder' was commonly heard, the productivity increases of the 1990s were largely driven by this reconfiguration of working time, by technological change and by the overall restructuring of workplaces and supply chains. All of this took place against a backdrop of labour shedding in manufacturing, as many manufacturers relocated their factories to China or other parts of Asia, and labour shedding in the public sector, as many statutory authorities were privatised or corporatised. As part of this process, the latter reduced their blue-collar workforces on a large scale and curtailed their commitment to workforce training. Traditionally, statutory authorities—like the Water Boards, Electricity Commissions and Railways—along with government trading enterprises—like QANTAS—had been the mainstay of vocational training, either through apprenticeships or in-house training programs. The reduction in their training commitment was evident at the individual level in their annual reports during this period, and evident at the macro level in the training figures for large workplaces. In 1990, for example, large workplaces had provided 26 per cent of all apprenticeships, but by 1997 this had already fallen to 14 per cent (Watson et al. 2003, p. 162).

The productivity gains of the 1990s were therefore largely driven by changes related to hours of work and by labour shedding, workforce strategies which must eventually reach some kind of limit. The poorer labour productivity performance of the last

10 years suggests such limits have indeed been reached. At the same time, the proportion of the population with post-school qualifications has climbed to over 50 per cent. Increased post-school education has, however, failed to ignite further productivity improvements. Indeed, were the linkages between education, marginal productivity and wages as robust as the human capital framework suggests, we might expect to see higher relative wages among this more highly educated sector of the workforce. However, as Figure 1.1 showed, there has been a long-term decline in the starting salaries for university graduates since the 1970s, and this has not abated during the 2000s.

None of this means that educated workers are not an asset to the economy, nor that their performance in the workforce is not enhanced by their education. Rather it suggests, as Marginson has argued (1993, pp. 13ff), that credentialism—credentials inflation—is a characteristic of Australian post-school education and that an over-supply of qualifications has led to a relative decline in their earning power. The content of many jobs, in terms of their skill demands, has not changed; but entry into their ranks now demands a higher level qualification. As we shall see below, this highlights an important issue in many workplaces: problems of skills under-utilisation and the existence of an ‘overeducated’ workforce.

2.2 Wage inequality

Wage inequality has increased in most western countries since the 1970s. Australia has not been immune from this, though the changes here have not been as dramatic as those in the United States and the United Kingdom. The literature exploring this phenomena is vast, but insightful accounts include Blau and Kahn (1996); Freeman (1996); DiNardo et al. (1996); Katz and Krueger (1992); Waltman (2000); Burtless (1998); Gossling et al. (2000). In the case of Australia, useful accounts of wage inequality in Australia exist for the 1970s (Norris 1977), for the 1970s to 1980s (McGuire 1993; King et al. 1992), and for the 1970s to mid-1990s (Borland 1999; Norris and McLean 1999).

Given the perspective on earnings and education outlined in the last chapter, it is not surprising that the human capital explanation for growing inequality in the labour market draws on the notions of ‘returns to skill’ or ‘returns to education’. Indeed, there is even the expectation among neoclassical labour economists that a properly functioning labour market—one free of the rigidities imposed by trade unions and minimum wage legislation—will exhibit high levels of wage dispersion, and this should be welcomed, as it indicates an efficient market at work. Lest this sound too harsh, it’s important to realise that neoclassical labour economists anticipate that in the long run wage dispersion will abate because the enhanced mobility of labour—brought about by removing these rigidities—will see the labour market settle into a new equilibrium.

One finds the human capital explanation for wage inequality explicitly outlined in the ‘skill-biased technological change’ thesis. In the words of Danziger and Gottschalk:

Technological change which raises the productivity of older and more-educated workers faster than that of younger and less-educated workers is consistent with increases in both relative wages and relative employment of more-skilled labor. If workers with more education are more productive, then firms will hire more of them in spite of their higher costs (Quoted in Galbraith 1998, p. 26).

James Galbraith provides one of the most comprehensive rejections of this human capital explanation. Labelling it ‘the skills fallacy’, Galbraith notes that the timing for this thesis is all wrong and that ‘the actual diffusion of computers occurred after the rise in skill or education premiums’ (1998, p. 35). He then proceeds to list three other major reasons why the computer revolution cannot explain rising inequality: it does not account for the ‘precise mechanism whereby tools and education interact’ to produce higher marginal productivities; it does not explain ‘the distribution of rising inequality across sectors, contrary to relative productivity movements, that apparently occurred in the early 1980s’; finally, it does not explain the increase in earnings premiums to experience and unobserved characteristics which began in the early 1970s (1998, p. 35).

Ultimately Galbraith settles on unemployment as the driving force behind the growth of inequality during the last quarter century. His major argument is that the onset of recessionary cycles since the 1970s has coincided with increasing levels of wage inequality in the US labour market. This has been compounded by poor monetary policy, an over-valued currency, and political resistance to raising the minimum wage (Galbraith 1998, pp. 8–9). The emphasis on unemployment is an important one. In Australia, Mitchell and his colleagues argued for many years that a long period of suppressed demand has been responsible for Australia’s high levels of unemployment during the 1990s and for its chronic problems of hidden unemployment, which remain to this day (see, for example, Mitchell 1998; Mitchell 1999; Mitchell and Muysken 2002).

To unemployment we need to add *underemployment*—a striking feature of the Australian labour market during the last two decades. As long ago as 1951, Reynolds argued that it was chronic underemployment, rather than the immobility of labour, which generated earnings inequality in the labour market (Botwinick 1993, p. 112). This position is most fully developed in the seminal work by Howard Botwinick: *Persistent Inequalities: Wage Disparity under Capitalist Competition*.

The starting point for this analysis is the recognition that real capitalist competition is quite different to the idealised competition of the neoclassical textbooks. For the latter, ‘competition’ is the basis for equilibrium and for the even development of the economy: its self-adjusting mechanism. By contrast, real capitalist competition is the ‘source of instability, crises and uneven development’ (Weeks 2001, p. 16). This emphasis on competition, instability and uneven development is most fully explored in the work of David Harvey (see, for example, his most recent book, Harvey 2010).

In terms of Botwinick’s thesis, the ongoing generation of profits takes place under conditions of capitalist competition which involve the relentless expulsion of labour from production through processes of mechanisation. In particular, the ‘uneven development of technical change’ leads to differential wage rates *across* industries. At the same time, differential wage rates also emerge *within* industries because some businesses hang on to their aging fixed capital whilst others adopt the latest techniques. As a result of competition, the more backward businesses face downward pressure on their wages, whilst the more advanced sectors are able to pay higher wages. This thesis dovetails with the arguments advanced by Robert Brenner (2002; 2006) concerning the problems of excess capacity which lie at the heart of the current malaise.

For the workforce, the uneven spread of technical change produces conditions of chronic unemployment and underemployment: the constant reproduction of a ‘re-

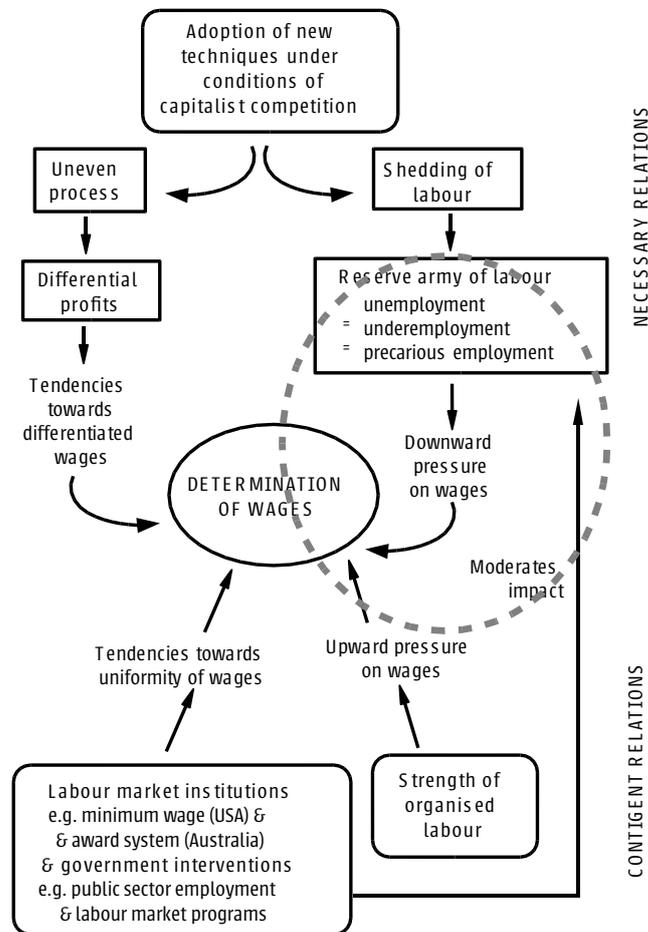
serve army' of labour. This reserve army is not a cyclical phenomenon, a reflection of deficient demand in the economy, but is continually generated by three dynamics: the rate of growth of investment; the capital-labour ratio, and the rate of labour force participation (Botwinick 1993, p. 74).

At this point we can observe how theories of segmented labour markets also dovetail with this account. Constant competition amongst the workforce—particularly the lowest paid—takes place against this backdrop of chronic underemployment and unemployment, and this results in constant downward pressure on wages. Segmentation does not just reflect the conditions of production—as emphasised by Edwards, for example—but also reflects the efforts of the workforce itself. As Marcia Freedman (1976) argued, workers themselves built 'shelters' to protect themselves from competition, thereby reproducing segmentation. While much of this analysis has focussed on the American labour market, one can immediately grasp its relevance in the Australian setting. The Award system, and the many 'restrictive' practices build into Australia's system of industrial relations during the twentieth century, represented attempts to take wages 'out of competition' and to build such shelters. Historically, when we look at who was placed outside these shelters—such as 'non-European' workers at the turn of the century and women for much of the century—we immediately see how broader social divisions became the basis for workforce divisions.

Returning to Botwinick, this co-existence of advanced and backward sectors sets the limits within which wages vary: in the advanced sectors the most efficient firms set the upper limit for wage levels, whilst in the backward sectors the presence of the reserve army of labour sets the lower limit. Botwinick further argues that chronic underemployment is the normal condition within the aggregate labour market, and as a result, labour mobility does not lead to the equalization of wage rates: 'low-wage firms ...continue to find ample sources of cheap labour within the reserve army. Consequently, there will tend to be little upward pressure on wage rates at the low end of the market' (Botwinick 1993, p. 111). The reserve army is bolstered not only by workers already in the low-wage sector, but from new entrants to the labour market. A model of wage determination, based on the Botwinick thesis, is shown in Figure 2.2.

How does this apply to the contemporary Australian setting, which is supposedly characterised by 'tight' labour markets? First, we need to appreciate that the notion of full-employment currently discussed in public commentary is part of the neoclassical theory of the 'natural rate of unemployment' (the NAIRU) and does not resemble the full employment of the 1960s, when unemployment rates rarely moved above 2 per cent (compared to today's 5 per cent).¹¹ Moreover, when one takes account of the labour under-utilisation rate—which incorporates under-employment—the overall measure of deficient demand for labour in the economy is probably more than double what it appears to be (see ABS 2009; Wilkins 2004). What's more, none of this takes account of those workers who have prematurely left the labour market altogether. One indication of the magnitude of this group are the working-age population who subsist on welfare benefits other than unemployment benefits: a group who numbers nearly 800,000. Finally, the last decade has also witnessed large movements of new labour market entrants: the 457 visa program, the foreign student influx, and the considerable movement of welfare recipients, such as single parents, into the workforce.

Figure 2.2: A model of wage determination



Source: from Watson (2002, p. 94)

It is instructive to note that the mining boom, and the supposedly tight labour market of recent years, has not seen a ‘wages explosion’ comparable to anything in the 1970s or 1980s.¹² This partly reflects the more decentralised system of wage bargaining which now prevails, but it also illustrates Botwinick’s thesis. The advanced sectors of the economy push against the upper limits, whilst in the backward sectors the combination of competition, under-employment and the infusion of new workers all serve to place downward pressure on the lower limits. Indeed, were it not for institutional arrangements—in the form of annual safety net adjustments to minimum wage rates—these dynamics would have seen the lower limits fall much further over the last decade.

So where does the Botwinick thesis leave us? In terms of educational policy it seems clear that the human capital explanation suggests that we simply need more of the same: a better educated workforce will be one with higher levels of marginal productivity and higher earnings. And, in the long run, earnings inequality should diminish. However, if Botwinick’s account is correct, and the dynamics of wage inequality are inherent in capitalist competition, then a larger increase in qualifications

amongst the workforce, with nothing else changing, will most likely lead to credentialism. In other words, the same jobs will exist, but their incumbents will be more highly qualified. The immediate objection to this—that a better educated workforce leads to the creation of better quality jobs—recalls the notion that ‘supply creates its own demand.’ A more realistic view might be that a better educated workforce is a necessary, but not sufficient, condition for the emergence of better quality jobs.

What does the empirical evidence suggest? Have the new, better quality jobs of the last quarter century emerged because the workforce is more highly educated? Is there evidence of widespread credentialism? To answer these questions we need to look at what employers look for when they engage labour—whether qualifications matter—and how they utilise skills within their workplaces.

2.3 Qualifications, skills and employers

What role have qualifications played in the Australian labour market, particularly over the last decade or so? How do these relate to skills? Ultimately, to answer these questions we have to leave behind the focus on labour supply—the mainstay of all the studies on earnings premiums—and look more closely at the demand side of the labour market, particularly the behaviour of employers. Fortunately there are a number of recent studies which help with this endeavour.

What do employers look for?

We are fortunate in having a recent study which helps answer this question. As well as looking at wage premiums, the Cully (2005) research discussed above also questioned employers on their recruitment practices. Cully began by observing that qualifications might be a ‘necessary condition of employment’, particularly in those occupations where professional associations regulated entry (Cully 2005, p. 19). Beyond this, however, qualifications might matter because they signalled to the employer the likely productivity of the applicant. It’s interesting to note, in the light of the earlier discussion in this chapter, that Cully’s use of this term is not a technical one—the marginal productivity aspect—but is part of that common-sense bundle of useful worker attributes mentioned earlier: ‘Productivity is a short-hand term which refers to a set of characteristics, such as effort, loyalty, likely tenure and pattern of absence’ (2005, p. 19).

In his review of the earlier literature Cully found that qualifications did not seem to feature strongly as an important issue for employers when recruiting workers. This research included employer surveys, case studies of job appointments and the activities of employment agencies. Cully’s own research included an analysis of internet job advertisements and interviews with recruitment specialists. In the advertisements, experience was the most commonly stipulated requirement (about 75 per cent of cases), followed by qualifications (34 per cent) and specific skill sets (26 per cent). Licences were mentioned in 6 per cent of cases. Where qualifications were mentioned, the most common reference was to a degree (or higher) followed by Certificate III/IV (18 per cent and 9 per cent respectively). Cully observed that the most striking aspect of these advertisements was ‘the lack of concrete detail in advertisements and the comparatively rare inclusion of qualifications as explicit selection criterion’ (Cully 2005,

p. 23). Even for professional jobs, a ‘surprisingly high proportion’ (45 per cent), made no mention of qualifications. In the case of tradesperson jobs, some 54 per cent made no reference to qualifications (Cully 2005, p. 25).

In an interesting analysis, Cully compared the relative importance of experience vis-à-vis qualifications across occupational groups and observed that experience was the attribute most commonly sought in all of them. For tradespersons, 62 per cent mentioned experience and 46 per cent mentioned qualifications. This was the narrowest gap. The largest gap was for advanced clerical and service workers, where 4 per cent sought qualifications and 82 per cent wanted experience. In this area, specific skills sets rated highly (such as experience with particular software like MYOB), leading Cully to suggest that ‘short targeted training courses may be of more value in attaining jobs’ in this occupational group than undertaking studies leading to formal qualifications’ (Cully 2005, p. 25).

In his overall summing up, Cully noted that for the higher level occupations (managers, professionals, associate professionals and tradespersons) qualifications did matter for getting a job, but experience was still more important. In the second group of occupations (advanced clerical and service workers, intermediate clerical, sales and service workers, and production and transport workers), experience was again the most important requisite while qualifications were ‘relatively unimportant’. Licences and specific skills were also important. Finally, in the lowest skilled occupations (elementary clerical, sales and service workers, and labourers), experience was all that mattered (Cully 2005, p. 25).

For his research on recruitment specialists, Cully looked at three segments of the labour market covering the top-end of the labour market, the trades and semi-skilled sector, and the bottom of the labour market (where unemployed workers sought jobs). At the top-end, which covered areas like executive recruitment and professional jobs (eg. accountancy or IT), the key requirements in an applicant were ‘business acumen’ and ‘personal savvy’, with psychological tests commonly used to gauge these. While qualifications were a good indicator of ‘diligence’, they were important only for entry-level jobs. The emphasis, for experienced applicants, was on competence and likely performance. At most qualifications were used for screening, and this could be relaxed in a tight labour market (Cully 2005, p. 27).

Cully’s research for the trades and semi-skilled jobs was focussed on a labour hire company, so the hiring procedures comprised two stages: getting on the books and then getting placements. For the first stage qualifications mattered, because it served as an indicator of ‘certified skills’, something employers insisted on. Once on the books, an individual’s performance on placements became the key determinant of how much work they were subsequently offered. Cully noted that for this labour hire company “a qualification signals that the person has desirable attributes, such as motivation and ‘a keenness to move up’. Account is taken of where the qualification was completed, with TAFE particularly well regarded” (Cully 2005, p. 27).

Not surprisingly at the bottom of the labour market, qualifications did not rate. For the agency attempting to place unemployed workers in entry-level jobs, the ‘whole strategy is *not* to focus on the attributes of the job or the person seeking work, but on the price’. Where training entered the picture it was simply in terms of job search, with assistance provided in preparing résumés, and sometimes extended to bridging

courses (such as Certificate II qualifications in areas like retail, clerical work and aged care) (Cully 2005, p. 28).

In his summing up Cully noted that apart from this screening role qualifications appeared to play only a small part in the decision-making of employers. Only for tradespersons were qualifications ‘relatively important’. In a finding which echoes the early results for wages premiums, there was not one job advertisement which specified a Certificate I/II qualification (Cully 2005, p. 29).

How do employers make use of qualifications?

Once recruited, do workers with qualifications make use of those qualifications? Do they actually need them for the job? A number of recent studies help illuminate these questions, though one often finds within this literature, a looseness in language, particularly around the notion of ‘skill’. For this reason, I will focus more specifically on issues of skill shortly.¹³

The usefulness of qualifications within the workforce are sometimes assessed in terms of ‘overeducation’, the idea that there is *mismatch* between the education level of the employee, and the skill requirements of the job. Using this notion, Ingrid Linsley argued that ‘In Australia close to 30 per cent of workers are overeducated and are underutilising their skills’ (Linsley 2005, p. 121). Linsley also showed that about 21 per cent of workers with a degree were working in jobs which didn’t require that level of education, while about 46 per cent of workers with a vocational qualification were in jobs not requiring that level.¹⁴

In its series *Education and Work*, the Australian Bureau of Statistics publishes data on the occupation and the highest level of non-school qualification of its respondents. An indication of the extent of over-qualification can be gauged from Table 2.1 showing data for 2006. Similar to Linsley, this showed that about 20 per cent of tertiary graduates were working in jobs which did not require that level of education (that is, lower than technicians and associate professionals). The proportion of VET graduates (Certificate III/IV) working in jobs not requiring these qualifications was about 35 per cent (that is, adding up the total for those occupations lower than intermediate clerical, sales and service workers).

Table 2.1: Highest non-school qualifications by occupation, 2006 (%)

	Tertiary	Cert III/IV	All VET
Managers & administrators	12	7	7
Professionals	58	6	11
Technicians & assoc profess	11	13	15
Tradespersons	2	37	24
Adv clerical & serv workers	2	2	4
Interm clerical, sales & serv	9	15	18
Inter production & transport	1	9	7
Element clerical, sales & serv	3	5	6
Labourers & related workers	1	6	6
Total	100	100	100

Source: ABS (2006, Table 12)

An important study by Cully et al. (2006) looking at VET graduates in NSW also focused on the extent of educational and occupational mismatches. That report found that only one in four persons achieved a match between the intended occupation (based on the training they undertook) and the actual occupation in which they were subsequently employed. The authors observed:

There is only one area where there is a strong match between the skill level associated with the occupation and with highest educational attainment: two in five men with a certificate III/IV are employed as either tradespersons or advanced clerical and service workers (skill level III). (2006, p. 6).

Utilising the NCVER's *Student Outcomes Survey*, Cully et al. (2006) showed that those students not in work prior to training fared worse in terms of occupational outcomes. Moreover, their prior circumstances were more influential than the type of training they undertook (2006, p. 18). In an interesting variation on the traditional matching approach, Cully et al. (2006, p. 34) contrasted the intended occupation of VET students with their destination occupations and showed that about 15 per cent of students end up employed at lower skill levels than intended in terms of the training they undertook. Among some occupations, for example, associate professionals, the proportion was more than double this.

In making an overall assessment, Cully et al. (2006, p. 35) defined outcomes as either 'good' or 'poor'. By good, they meant that the individual was employed after training in their intended occupation; or, they were employed at the same, or at a higher skilled level; or, they were enrolled in studying towards a higher level of qualification. On the other hand, a poor outcome was one where, after training, the individual ended up at a lower skill level than their intended occupation or was unemployed; or, was not undertaking further study; or, was not studying for a higher level qualification. By these criteria, Cully et al. (2006) judged that about 70 per cent of VET graduates in 2005 experienced a good outcome and 29 per cent experienced a poor outcome.

All of these different studies point in the same direction, and suggest that about one third of the Australian workforce is 'overeducated', in the sense that there is a mismatch between their qualifications and the jobs they do. Does this level of overeducation exist because too many graduates are being produced, or because too many jobs are being 'dumbed down'? Is there a large-scale process of deskilling underway in the labour market, along the lines suggested by Braverman (1975) in the 1970s (and argued over ever since)? For an insight into this question, we can draw upon a study by Sheehan and Esposto (2001) which set out to explore how the actual *content* of jobs in the Australian labour market has changed over the last few decades.

The content of jobs

The Sheehan and Esposto (2001) study was quite innovative, utilising an occupational database called O*NET to map the *knowledge intensity* and the *work activities* of 400 occupations in Australia over the period 1976 to 1996. The knowledge intensity of jobs was measured in two ways: whether the knowledge was important for the job and whether the knowledge was required at a high level (Sheehan and Esposto 2001, p. 223). In this part of the analysis the authors concluded:

Consistent with the emergence of the knowledge-based economy, the knowledge intensity of full-time jobs has increased substantially over the past decade. The measures used to reach this conclusion take account of both the importance of knowledge to the job and the level of knowledge required in the job (Sheehan and Esposto 2001, p. 230).

There were, however, some important variations on this finding: differences between male and female employment and between full-time and part-time jobs. Among women, the rate at which less knowledge-based jobs were growing was much more rapid than among men. At the same time, the knowledge intensity of part-time jobs was declining, a trend which the authors characterised as a decline in the ‘quality’ of part-time jobs. This decline was evident for both men and women, though it was somewhat greater among men.

Turning to the activities which characterised these jobs, Sheehan and Esposto (2001) examined whether the contents of jobs had changed in terms of nine key activities, such as searching for information, interacting, undertaking physical work, and so forth. In calculating activity scores, the authors again found important full-time and part-time differences. Among the full-time jobs there were increases in all activities suggesting that ‘full-time work has become more demanding in an activity sense’, with the only declines being in terms of physical and manual activities. By way of contrast, for part-time jobs the importance of most of the nine activities had fallen over the period from 1976 to 1996, a result that was consistent with their findings on the quality of these jobs (Sheehan and Esposto 2001, p. 239).

In summary, how have jobs changed over the last few decades? As Sheehan and Esposto (2001, p. 240) noted in their conclusion: ‘the full-time labour market has become more demanding’ both for knowledge-intensity and higher levels of work activity; broadly based knowledge competence had become more important than narrow expertise; processing information, and making decisions, as well as interacting with others, had also become increasingly required in jobs. At the same time, opposite trends were underway in the part-time labour market, especially for men: ‘the quality of part-time jobs seems to have declined, particularly for men, and there seems to be evidence that it is becoming more difficult to hold down high-quality jobs on a part-time basis’ (Sheehan and Esposto 2001, p. 240).

This study suggests that questions about ‘jobs in general’ or ‘aggregate labour market trends’ are not particularly helpful. Instead, it is recognising the polarised nature of the Australian labour market which holds the key to understanding education and the labour market. This polarisation has been recognised for some time now (it was a major theme, for example, in Watson et al. 2003), and it becomes a key part of understanding the role which skills play in the labour market.

How do employers make use of skills?

In a study published in 2008, before the onset of the global financial crisis, I argued that employer association claims of widespread skill shortages were exaggerated (Watson 2008*b*, pp. 6–8). Using data from the skilled vacancy index and from NCVET’s employer surveys for 2005 and 2007, I suggested that about one fifth of employers were experiencing difficulty recruiting staff. These difficulties were not the same as ‘skill

shortages, since there can be other reasons for such recruitment difficulties. Using a subset of responses—where employers pinpointed industry skill shortages in their answers—I calculated that about 15 per cent of employers faced actual skill shortages. This was an all-industry average, and the mining industry stood out as a glaring anomaly: 34 per cent of employers there faced skills shortages. In the case of the skilled vacancy index, this had largely remained flat from about 2000 onward, with only Western Australian—the home of mining—standing out decisively.

As well as skills shortages, I also looked at skills gaps, the situation where employees don't have the required 'qualifications, experience and/or specialised skills to meet a firm's skill needs' (ABS 2000, p. 15). This led to the conclusion that the size of the skills gap in Australia was about 5 per cent. By way of contrast, some 37 per cent of employers regarded their employees as having skill levels *above* what was required (Watson 2008b, p. 9).

With findings such as these—in a context of constant claims of a skills crisis—I then pursued the question of how employers were actually utilising the skills base which existed in their workplaces. For this I drew upon both the NCVET's student outcomes surveys and the HILDA data. The rate of skills under-utilisation for employees with VET qualifications was between about 10 per cent and 15 per cent. As an average, this figure obscured some important occupational and industry differences. For managerial and professional jobs, skills under-utilisation was very low—about 4 per cent—whereas in the low skilled occupations of elementary clerical, sales and services, and among labourers, the figures reached the 20 per cent range (Watson 2008b, pp. 10–11). When other major cleavages in the labour market—around hours and employment status—were included, the divergences were also quite pronounced. Whereas only 6 per cent of permanent full-time workers reported not using their skills and abilities, the figure for casual part-time workers was 18 per cent (Watson 2008b, p. 14).

Two recent studies also used HILDA data to look at 'overskilling' (Mavromaras et al. 2009; Mavromaras et al. 2010). In the earlier study, Mavromaras and his colleagues began by drawing the important distinction between being 'overeducated' and being 'overskilled':

Those who are defined to be overskilled (i.e. those who have more skills and abilities than their jobs require) need not necessarily be overeducated, they simply can do more things than their job requires' (Mavromaras et al. 2009, p. 61).

Mavromaras et al. (2009) used as their measure of overskilling a question in HILDA which asked for agreement with the statement: 'I use many of my skills and abilities in my current job'. They then constructed three categories: the *severely overskilled*, the *moderately overskilled*, and the *well matched*. They found, overall, that about 12 per cent of employees (in full-time employment) were in the severely overskilled category and 30 per cent were in the moderately overskilled category (Mavromaras et al. 2009, p. 63). Interestingly, when broken down by educational level, there was little variation in the figures. The most notable finding was for the category of severe overskilling where they found a considerable difference between early school leavers (16 per cent) and tertiary graduates (9 per cent). The rates for both moderate and severe overskilling among VET graduates were very close to the overall averages. Mavromaras et al. (2009, p. 64) also proceeded to estimate wage equations for their sample

and found that the severely overskilled earned about 10 per cent less than their well-matched counterparts and the moderately overskilled earned about 2 per cent less. Among VET graduates the penalty was somewhat lower, at about 6 per cent, while among university graduates the figure reached nearly 20 per cent.¹⁵

Overall, these figures for overskilling are quite striking. Keeping in mind that the population excluded part-time employees—which as we have seen, are likely to be worse affected—some 42 per cent of the workforce had some degree of overskilling. While the figure for VET graduates was slightly less—about 40 per cent—it still represents a considerable number of workers. It is moreover, similar to the figure which Linsley found for overeducation among VET graduates (46 per cent). It is important to keep in mind, however, that a considerable proportion of VET graduates work in occupations which are different to those they trained for (Mavromaras et al. 2010, p. 20).

In their later study, Mavromaras et al. (2010) used more waves from the HILDA survey and provided more detailed estimates for the educational levels. Their results are shown in Table 2.2, which shows the incidence of overskilling by educational level.

Table 2.2: Reported overskilling in employment (%)

	Extent of overskilling			%
	Well matched	Moderately overskilled	Severely overskilled	
All employed	50.99	30.68	18.32	18.69
Year 10 and below	47.39	32.25	20.36	25.79
11–12 Certificates I/II and below	45.19	35.88	18.92	1.73
Certificates III/IV and apprenticeship	62.13	27.88	9.99	21.02
Diploma/degree	62.46	26.33	11.21	32.78
All qualifications	56.06	29.16	14.78	100.00
No. of observations	23,688	12,322	6,245	42,255

Notes: Uses waves 1 to 6 from HILDA.

Source: Mavromaras et al. (2010, p. 14).

These figures reinforce the earlier findings, but suggest that the overall level of severe overskilling was somewhat higher (at 15 per cent). In terms of VET, it showed that Certificate III/IV holders had the lowest levels of overskilling—at about 10 per cent—but the figure was still higher than that found in the earlier study. The combined figure for overskilling for these VET graduates was about 38 per cent. By contrast, those with Certificate I/II had very high concentrations of overskilled workers in their ranks: 19 per cent were severely overskilled and 36 per cent were moderately overskilled (2010, p. 14). As the authors observed, in summing up their modelling: ‘the overskilling incidence is concentrated where the probability of doing menial or low-level jobs is high’ (2010, p. 22).

As an additional part of their analysis, (Mavromaras et al. 2010, p. 23) also examined state dependence among the workforce, that is, the notion that being overskilled persists into the future by virtue of already being overskilled. While they found evidence for this among non-VET graduates, this was not the case for VET:

we find no evidence of mismatch state dependence, or ‘stickiness’, amongst VET graduates in employment. By contrast, there appears to be over-

skilling state dependence for both the ‘up to Year 12’ category and even more so for the diploma/degree category ...the evidence ...supports the view that in the case of VET graduates any severe overskilling state dependence that may be present tends to be a short-term phenomenon that dissipates quickly ...Considering the long-term costs that severe overskilling imposes on workers, VET graduates score very well with the lowest costs. The opposite is true for workers qualifying by more conventional academic routes (Mavromaras et al. 2010, pp. 23–24).

Finally, as with their earlier study Mavromaras et al. (2010, p. 25) also found an earnings penalty for those workers who were severely overskilled, ranging from 13.8 per cent to 18.9 per cent among graduates and from 11.6 per cent to 14.4 per cent for vocationally qualified workers.

The conclusions which Mavromaras and his colleagues drew from their analysis were:

It looks as though the incidence of bad matches in the workplace are the problem of lower education levels. The best way to guard against a worker ending up overskilled in their workplace appears to be post-school education. The overall message is clear: employed people with higher education levels are less likely to be mismatched in their workplace (Mavromaras et al. 2010, p. 27).

If the policy implications of this are that a larger number of more educated workers is needed to reduce overskilling, we are back with ‘supply creates its own demand’. How the content of jobs which demand fewer skills than those already held by their incumbents can change by virtue of a more highly educated workforce is hard to envisage. Certainly, individuals who get more education may have a better chance of personal success in finding a well matched job, but the overall job structure will stay the same. All of those labouring and elementary, clerical, sales and service jobs will still remain and still need filling.

The basic problem with the interpretations (as opposed to the findings) advanced by Mavromaras and his colleagues is that they take the high correlation between education and overskilling and interpret it as a causal relationship. Had they focussed on hours and employment status, then they would have found high correlations between part-time casual jobs and overskilling. But such an analysis would have focussed on the demand side of the labour market, and that is beyond the horizon of these researchers.¹⁶

When they move beyond the focus on educational background to look at their occupational results, Mavromaras et al. (2010, p. 28) appear to concede that overskilling might just have something to do with the jobs on offer:

it could be jobs attributes that are responsible for these differences. It could be that the lower/elementary occupations do not have the potential to adapt to individuals who may be able to do more than the original lower specification of their job, so that they remain overskilled.

3. Labour market adjustment

3.1 The current policy context

Issues of skill formation took centre stage in early 2011. The Productivity Commission released its report on the VET workforce (Commission 2011), Skills Australia released its ‘roadmap’ for vocational education and training (Skills Australia 2011), and the Federal Budget provided increased funding for a range of skill-related initiatives. All of this took place in the context of a heightened concern about emerging skill shortages existing alongside chronic problems of long-term unemployment and underemployment.

Early 2011 also saw the publication of an article which brought unemployment squarely into focus. Peter Davidson’s study of employment assistance programs in Australia since 1990 provided a number of sobering statistics. Prior to the downturn in 2009, the number of long-term recipients of unemployment benefits was over 300 thousand. ‘This was well above the number two decades earlier, despite robust employment growth and an unemployment rate that plummeted to 30-year lows’ (Davidson 2011, p. 83). Those on payments for over two years rose from 16 per cent to 43 per cent and those on payments for over five years rose from 5 per cent to 23 per cent. By way of explanation, Davidson observed that:

...as unemployment fell, the profile of recipients of unemployment payments became more disadvantaged ...with a higher incidence of Indigenous peoples, people of mature age, people with disabilities, and people with social barriers to work such as homelessness, addictions or mental illness (Davidson 2011, p. 83).

By 2011, with economic recovery well underway in Australia—yet lagging poorly in Europe and North America—skills shortages had begun to re-emerge in the labour market. However, the long-term unemployed people enumerated by Davidson were among the most poorly placed to take advantage of this recovery. In 2011 it was evident that the growing skills needs of the Australian economy were more likely to be met from overseas sources than domestically.

In April 2011 Skills Australia published its roadmap for skills formation in Australia (Skills Australia 2011). The Skills Australia report was a particularly insightful publication, delving into many of the themes which have been discussed in this report, particularly productivity, workforce participation and labour market restructuring. In the discussion which follows I draw upon some of these insights as I survey some of the current challenges facing the Australian labour market when it comes to unemployment and VET.

3.2 The costs of economic restructuring

The modernising of the Australian economy which has taken place since the 1980s has had both positive and negative consequences. On the positive side, Australia's relatively low unemployment rate—hovering around 5 per cent—and its low levels of public debt contrast sharply with many other OECD countries struggling with unemployment rates of 8 per cent and upward and levels of public debt which have become unsustainable. However, the negative outcomes are equally stark. Inequality has grown steadily over the last 20 years, a major housing affordability crisis has emerged in most capital cities and the labour market itself has become increasingly polarised, with high levels of casual work, persistent underemployment and intractable long-term unemployment. This inefficient under-utilisation of labour exists alongside emerging skills shortages in various sectors of the labour market. Skills Australia refers to the 'structural mismatch' in the Australian labour market which began in the 1970s whereby the 'the growth in job opportunities [was] not being matched by the skills of those who are underemployed or unemployed' (2011, p. 22).

In recent years structural imbalances in the economy have become more evident, with a highly valued currency driven by the commodities boom exerting major pressure on other industries, particularly manufacturing, tourism and even retail. In the case of manufacturing this latest predicament is the culmination of several decades of relative decline during which the policy choices taken have rarely addressed the costs of this decline. Large numbers of older workers, employed at some stage in manufacturing, missed out on the new jobs when their old jobs disappeared. They now find themselves in the ranks of long-term employed, the prematurely retired, or surviving on the Disability Support Pension (DSP). Equally disturbing are the large numbers of younger workers who might once have expected to find stable jobs in manufacturing workplaces and who now confront either unemployment or intermittent employment in casual service-sector jobs.

A collection of papers published in 2001, *Work Rich, Work Poor: Inequality and economic change in Australia*, attempted a labour market assessment of some of the facets of economic change during the 1980s and 1990s. Only 25 per cent of the new jobs created during the 1990s were full-time, and the growth rate of full-time jobs was only about one-quarter of that in the 1980s. What's more—as was noted in the last chapter—the quality of these part-time jobs declined. Indeed, the vast majority (75 per cent) of all new jobs created during the 1990s were casual jobs. Particularly notable was the dramatic growth in full-time casual work: it more than doubled during the 1990s.

While there is considerable debate about what constitutes a 'casual' job, and whether it is equivalent to 'precarious employment', there is a broad consensus that these kinds of jobs do not offer the security of employment available through 'permanent' jobs. What's more, casual jobs exacerbate labour market churning, the movement in and out of jobs and in and out of the labour force. The 'working poor' and young job seekers are particularly vulnerable to labour market churning, but casual jobs are overwhelming the kinds of jobs on offer to them. When it comes to workplace training, casuals also miss out, since they are not regarded as core members of a firm's workforce.

The 1990s also saw levels of under-employment rise, with about one quarter of the part-time workforce unable to work the number of hours they required. At the

same time, the relative earnings of part-time workers declined during that decade. The polarisation of the labour market noted in the last chapter was also emphasised in this collection of papers, and its broader social relevance was noted:

This social crisis in the midst of a buoyant economy is evident from many signs in Australia's cities, towns and rural areas. These range from manifest inequalities in entry to, and rewards from, economic activity to increasing demand on emergency relief agencies, public hospital casualty wards, crisis centres and services for the homeless ...

To those who focus on aggregate economic indicators talk of a social crisis, especially one driven by trends within the economy, is incomprehensible. After all, for much of the past decade employment and average real earnings have been growing strongly, and unemployment has been falling ... But the disadvantage and distress in many Australian communities is real indeed, and the fact that the crisis has developed through a period of strong economic growth has been one of its most distinctive, and most disturbing, features (Borland et al. 2001, pp. 2–3)

Certainly some of the weaknesses in the labour market were the result of the economic restructuring wrought by the early 1990s recession. It took many years for strong economic growth to resume. In the last 10 years, however, economic growth has been solid, but many of these weaknesses have not been overcome. The proportion of people on unemployment benefits for more than five years rose from one in 10 in 1999 to almost one in four in 2008 (Davidson 2011, p. 55). Over the same period the numbers of working age persons on Disability Support Pension has continued to grow, with their numbers exceeding those on Newstart since 2002. By 2010, the numbers on unemployment benefit (Newstart and Youth Allowance) were over 600 thousand, while the numbers on Disability Support Pension had reached nearly 800 thousand. These trends led one researcher to observe: 'at present more people will die on DSP or move onto the old age pension than will move into employment' (Fowkes 2011, p. 11).

3.3 Labour market adjustment

Concerns about both the long-term unemployed and those on DSP have been central to policy debates in recent years. Similarly, increasing the labour force participation among other groups on welfare, such as single parents, has also been emphasised. While there are no doubt genuine concerns for the welfare of these groups among policy makers, there is also the recognition that increased levels of labour force participation are crucial for continued economic growth. As this paper has suggested, wringing more productivity from workplace change has limited prospects of success. Work intensification has largely reached its limits. Workforce development and increased workforce participation remain the most likely vehicles for sustaining economic growth.

Effective labour market programs are central elements in any strategy for economic growth for two reasons. The first is that increased workforce participation is not simply about incentives and penalties. It also entails an enabling philosophy towards welfare rather than a populist punitive strategy or a cost-cutting budgetary

exercise. Both of these have been evident in the breaching regimes which have been central features of welfare policy in Australia over the last decade (see, for example, Davidson 2011).

The second reason for emphasising effective labour market programs is that the existing workforce can expect continuing disruptions to their working lives as the Australian economy restructures. In coming years this is likely to revolve around measures to reduce carbon pollution. As with the economic changes of the 1980s and 1990s, the coming tumult in the economy will see many existing workplaces close and many new workplaces open. Only effective labour market programs can ensure that the job losers also become the job winners, and do not end up among the ranks of the long-term unemployed.

In emphasising the importance of ‘a deep, flexible and portable skills base in our economic and social fabric’ the Skills Australia roadmap (2011, p. 20) recognises that sustaining economic growth requires new approaches to productivity and workforce participation. Effective labour market adjustment programs are likely to be central to this strategy.

The relevance of Scandinavian examples in Australia has been regularly debated since at least the publication of *Australia Reconstructed* in the late 1980s. Nevertheless, the experiences in that corner of the world illustrate the issue of labour market adjustment in a very succinct manner. In attempting to make their economies more open and dynamic, the Scandinavian democracies learnt that labour market adjustment needed to be carefully engineered. If firms were to close down, in order to free up both capital and labour for more profitable pursuits elsewhere, then public policy needed to ensure that the workers affected were not thrown on the scrap heap but had a positive future in the new dispensation. The waves of deindustrialisation that swept through the UK and the northern states of the USA in the late 1970s and early 1980s, had largely taken the scrap heap route; as did the later modernisation waves for much of Eastern Europe (see, for example, Bluestone and Harrison 1982). The social inclusion agenda, which gained prominence in Britain during the 1990s, attempted to address the social wreckage brought about by this economic dislocation. Shortly I will look more closely at one Scandinavian-inspired model that has been recently proposed for Australia. For the moment, my focus is on Australia’s limited attempts to deal with economic restructuring and the prevalence of a welfare-to-work philosophy rather than an effective labour market adjustment approach.

The Working Nation scheme developed by the Australian government in the early 1990s reflected an emphasis on effective labour market adjustment and addressed the core link between economic restructuring and long-term unemployment. Despite some common elements, the Coalition’s Job Network marked a profound departure from this approach. Working Nation had emphasised skill formation and had confronted the problem of inadequate labour demand. It incorporated on-the-job and off-the-job training, with both wage subsidies and public sector job creation to ensure that the Job Compact—a guarantee of a job for every eligible unemployed person—could be delivered.¹⁷

By way of contrast, the Job Network was located within the welfare-to-work philosophy which had become dominant in various overseas countries (particularly the United States) during the 1990s. It was basically an individualist framework which emphasised behavioural change aimed at overcoming ‘the passivity and de-motivation

that may develop with long-term spells of unemployment' (Productivity Commission, quoted in Fowkes 2011, p. 6). The Job Network epitomised the OECD's dichotomy between the 'passivity of welfare' and 'active labour market programs' and thus endorsed the OECD's labour supply perspective. From this point of view, the problem of unemployment was largely a problem of the unemployed, not a product of deep economic restructuring which required adequate labour demand measures.¹⁸

The retreat from serious labour market adjustment into narrow welfare-to-work strategies had both political and ideological roots. Working Nation was the child of the Keating Government's last years and its implementation was expensive. It was evident that labour market programs of this nature—with their extensive case-work approach—could not be done on the cheap. At the same time, the cultural roots for punishing the unemployed were never far away. Australia's history as the 'wage earners welfare state', meant that material support for the unemployed was invariably conceived in short-range welfare terms (Macintyre 1985). The absence of social insurance along the lines of the European welfare states had been a notable feature of Australia's post-war history and the 'dole' had never been intended to provide a livelihood. Its stigma has never diminished, even in recessionary periods. Finally, the dominance of neoclassical thinking about the labour market also played a role in this emphasis on welfare-to-work since it dovetailed neatly with supply-side solutions to labour market restructuring. The cost, however, was that innovative solutions to labour market adjustment were absent from the policy debate. To this day, labour market policy in Australia has not embraced a life-cycle perspective, along the lines of transitional labour markets (Schmid 1995; Schmid and Gazier 2002), nor has it grappled fully with the concept of *security* (Standing 1999; Standing 2002). The legacy of the Howard years remained evident under subsequent Labor governments, with unemployed workers still treated in a punitive and moralising fashion. The Howard government's 'Work for the Dole' was not abolished by the incoming Labor government, nor was the restructured Job Services Australia much of a departure from the Job Network. The most notable difference in employment policy between the two governments was the Productivity Places program, a large-scale vocational training program for jobless people introduced in 2008–09 (Davidson 2011, p. 85).

In her overall assessment of the failings of the Job Network, Lisa Fowkes, the former Chief Executive of Job Futures, noted the legacy of a decade of Conservative government: 'a system which treats unemployment as, at its core, a moral failing of individuals. While assistance is provided, the major form of intervention is to increase pressure and to change behaviour of job seekers' (2011, p. 4). The design of the system meant that assistance to the unemployed emphasised early placement in any job, regardless of its quality or likely duration, rather than a tailored program to equip the unemployed with useful skills (through TAFE, for example) (Fowkes 2011, p. 6). As Fowkes noted 'any strategic effort to upskill or reskill unemployed people prior to placement was discouraged by the system itself' (2011, p. 6).

In judging the Job Network a failure, and seeing little improvement in the Job Services Australia, Fowkes advocated a radical restructuring of the system, rather than further incremental tinkering. She argued for the need to move beyond moralism and punitive sanctions and to embrace the 'building capabilities' framework advanced by Amartya Sen. As she argued:

...if we want labour market programs that foster adaptation then they need radical change. They need to build individual capabilities – not just

in terms of vocational skills, but in the ability to make effective decisions. The risks and social costs associated with work in a labour market that is increasingly volatile need to be shared. Adaptation is not just a task for the unemployed, it is also a challenge for employers. They need to be engaged in a discussion of how structures can be adapted to support inclusion of those currently outside the workforce (Fowkes 2011, p. 4).

There are two important dimensions to successful labour market adjustment. One is improved job matching. This is important because it minimises job turnover and labour market churning. It also means that workers don't spend too much time on the dole in the first place. Historically, labour exchanges and social networks played a key role in job matching, so it is appropriate to briefly examine how these function in the context of the 21st century. The second dimension is skills formation through labour market programs, so that displaced workers and the long-term unemployed remain in jobs long after assistance measures have been removed.

Labour exchanges in the 21st century

The labour exchanges of the 20th century in Australia were both physical and social. Access to information on jobs was provided by a widespread network of CES offices and, in many small towns, through the local pub. These were physical places. The classified jobs section of the metropolitan, regional and local newspapers were also largely physical. By way of contrast, information about jobs in the 21st century exists in cyberspace, with the internet replacing newspapers and touchscreen kiosks replacing notice boards. Not only is this a vast improvement when it comes to disseminating information, but it offers greater potential for job matching than was ever possible before. For this to work more efficiently, however, several issues need addressing.

As Cully noted in his overview of internet job advertisements:

Perhaps the most remarkable finding of this exercise is the lack of concrete information contained within job advertisements. In particular, there is very little information on putative employment conditions. More than a third of all advertisements (37%) did not specify working hours, while an astonishing 70% did not disclose in the advertisement whether the job was permanent, or for a fixed-term, or casual (Cully 2005, p. 22).

The absence of information on remuneration is also a disturbing feature of these advertisements. For a labour exchange to work efficiently, the flow of information needs to be 'frank and fearless'. If honesty is expected from workers in their résumés, then full disclosure should be forthcoming from employers. There is clearly room for better regulation in this sphere, with a possible role for the ACCC under its truth in advertising mandate.

Secondly, the digital divide may see these new labour exchanges restricted, rather than broadened in its reach. To ensure against this, universal access to the internet is obviously essential. As many have argued, the internet in the 21st century should be a basic utility, much as water or electricity supply has been in the 20th century. The National Broadband Network promises to deliver this, though its cost to subscribers may still put it beyond the reach of low income households. Clearly, the role of local

libraries and community centres in ensuring universal access to the internet is one obvious requirement for these labour exchanges to work effectively. Another are the computer skills needed to make such an interaction a fruitful exercise, skills which the VET sector is ideally placed to provide.

Even with touch screens, computers can be daunting because the logic behind the interaction is often far from the lived reality of its users. Everyday life is littered with frustrating computer interactions—whether ATMs, telephone systems or digital television recorders. Some of this is inevitable, and reflects the user-hostile design of the system; but some is simply due to a lack of digital literacy: the skills to decode the logic systems which are at work in the interaction.

These reflections on the importance of digital literacy are given concrete expression in the Skill Australia roadmap. That report emphasises the teaching opportunities in the VET sector which are provided by digital technology and broadband internet, and notes that ‘Broadband developments will offer untold opportunities to more easily reach learners and enterprises’ (Skills Australia 2011, p. 7).

The social dimension of the traditional labour exchange was also present in those social networks which operated at neighbourhood level. Particularly in tight-knit working-class communities, the route into most jobs was through these networks rather than through more formal channels. In his research into the American ‘underclass’, William Julius Wilson explored the links between the dramatic deterioration in the labour market for unskilled urban workers, and the decline in the social environment of inner city areas.¹⁹ As he saw it, the breakdown of this resulted in ‘weak labour force attachments’ by African-Americans living in these areas, often termed ghettos. Where conservative commentators had viewed this weak labour force attachment as an individual failing (Ken Auletta and Charles Murray for example), Wilson was adamant that the term was a ‘structural concept set in a theoretical framework that explains the vulnerability of certain groups to joblessness’ (Wilson 1991, p. 472). He argued that this problem was the combined effect of both the limited job opportunities offered by the local labour market, and the breakdown in those informal job network systems and other resources which had traditionally stabilised urban black working class communities. Wilson explained both these developments in terms of the deindustrialisation of the large industrial metropolises of the North East and Midwest. The accompanying exodus of middle-class black families out of the inner city ‘made it more difficult to sustain the basic institutions in the inner city (including churches, stores, schools, recreational facilities etc.) in the face of prolonged joblessness’. In turn, the social organisation of these neighbourhoods also declined (Wilson 1988, pp. 58–59).

While the scale of the changes in Australia have been less dramatic, and the research agenda far less developed, similar problems have also occurred in working-class neighbourhoods in Australia, both in the outer suburbs and in rural areas. While he does not pursue this issue of job networks, the work of Boyd Hunter has been important in emphasising the damaging impact of economic restructuring on Australian neighbourhoods since the 1970s (Hunter 1995; Hunter 2003). Similarly, the work of Ian Falk and his colleagues into issues of regional education has explored the links between employment and social capital (Falk and Kilpatrick 2000; Falk 2001). They point towards the importance of ‘weak ties’ in securing employment:

...accessing employment was enhanced if people had access to networks outside their immediate circles. Granovetter called these ties strong ties and weak ties. He found that strong ties—those bonds that people used regularly, such as family and neighbourhood interactions—were not as useful for finding employment as the weak ties—those ties that bridged to outside the immediate community. In fact, Gittell and Vidal differentiate between these two kinds of ties by using the terms ‘bonding ties’ and ‘bridging ties’ ...Stack’s (1974) comprehensive ethnography shows how the lack of ties to sources outside the community results in restricted (among other things) knowledge of employment opportunities.

Clearly, the problems of unemployment emphasised by Wilson pointed towards the importance of the local, informal networks, while the research on weak ties emphasised the wider connections beyond the local community. These two explanations are not in tension, but signal an historical evolution. One can see that a ‘deindustrialised’ neighbourhood loses local job opportunities and with it, the traditional pathways into those jobs. Once this jobs ‘wasteland’ evolves, or where a neighbourhood develops without a strong jobs base in the first place—as with many of the public housing suburbs in Australian cities—it is the availability of ‘bridging ties’ that provide an important avenue into employment.

These insights about neighbourhood networks are important for two reasons. First, the labour exchange of the 21st century, with its extensive reach in cyberspace, can provide one kind of bridging tie into outside employment. One sees ‘weak ties’ constantly built in cyberspace, in the various internet forums which spring up around group interests, whether that be hobbies, software problems or consumer purchases. Extending this in a useful fashion into employment forums awaits development.

Secondly, along with primary and secondary schools, VET is uniquely placed to respond to local communities. While a few universities have decentralised campuses, this does not signal a connection with local neighbourhoods, and indeed, most universities are heavily centralised. By contrast, not only are TAFE colleges widely spread, but a long history of connections with local communities, and with local industries and businesses, has been a hallmark of their operations. In the same way that local high school careers advisers often have personal links with a range of local businesses, so too have TAFE staff traditionally been anchored in their local communities. While this may have eroded over the years, new initiatives, like school-based apprenticeships, reaffirm the importance of *locality* within the VET framework.

Skills Australia argues that VET has a major role in ‘reaching people who have only been marginally or intermittently connected to the world of work and formal education’ (2011, p. 24). It ‘strong profile in appealing to and attracting such learners’ makes the sector ideally placed to intervene at a local level in helping rebuild employment networks. Part of this involves rebuilding the historical connections between working-class youth and ‘technical training’ which were once a mainstay of employment in local communities. Another part entails revitalising lifelong learning, so that individuals flow in and out of educational institutions throughout their working lives as a matter of course rather than as a symptom of obsolescence.

Skills formation and labour market programs

'Any job is better than no job' is a familiar refrain, but it hides a core problem. As research by Perkins and Scutella (2008) and Watson (2008a) has emphasised, the 'no pay low pay' cycle is a feature of the interface between the low wage sector and unemployment. Labour market policies which simply 'privileg[e] ...the initial transition into employment' (Perkins and Scutella 2008) do little to overcome problems of labour market churning. In a similar vein, in 2007 the Australia Council of Social Services (ACOSS) criticised the government's 'Welfare to Work' policy for its emphasis on 'moving people rapidly into jobs, often at the expense of upgrading their skills' (ACOSS 2007). ACOSS also commented on the close links between low skilled work and the predominance of part-time and casual employment which has been a theme of this paper.

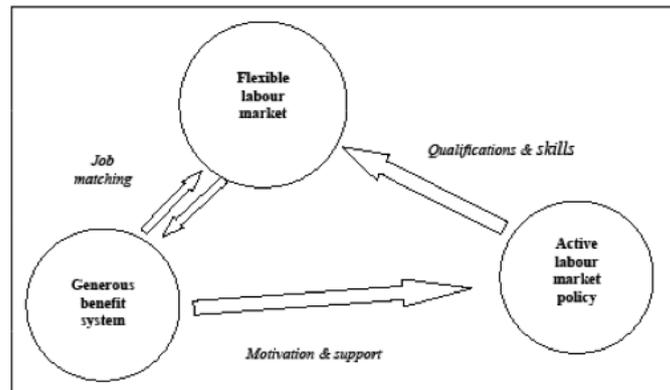
For many people, the pathway to escape from labour market churning or a succession of casualised jobs and to find security in employment involves enhancing their skills. For some, this means industry-specific skills. For others, it means consolidating foundational skills. Whatever the case, it is clear that the role of VET can be central in achieving skills enhancement for people on the margins of the labour market. As Skills Australia puts it: VET 'occupies a special position at the interface of the labour market and welfare systems and is a powerful lever for change' (2011, p. 21).

Consistent with this approach is one of the key policies promoted by Skills Australia in its roadmap for prosperity. It advocates a closer integration between employment assistance and vocational training, and the need to 'bridge the gap between the policy silos' in these two domains (2011, p. 109). Among a range of reforms, Skills Australia argues for establishing formal links between employment services and vocational education and training providers; for increasing resources for the public providers of VET; and for formal recognition of the importance of adult and community education (ACE) (2011, pp. 5, 13).

The practicalities of VET engagement in this challenge have been explored recently in two important NCVET reports, *The role of vocational education and training in welfare to work* (Guenther et al. 2008) and *Complex not simple: The vocational education and training pathway from welfare to work* (Barnett and Spoehr 2008). In the remainder of this section I outline another dimension of this challenge. In this discussion of the role of VET it is important to move beyond the welfare-to-work theme and refocus on the theme of labour market adjustment. I discuss in some detail an innovative proposal from within the labour movement which leads us back to the Scandinavian approach to labour market adjustment and the importance that lifelong learning plays in enabling workers to adapt to economic restructuring.

Grant Belchamber's outline of 'flexicurity' was published at the end of 2010 and drew upon his research during a study tour of Denmark and Sweden during 2009. These innovative ideas resurrected the labour movement's tradition of looking towards the Scandinavian social democracies for social and economic inspiration. This awkward word is the combination of flexibility and security and contains three planks: labour market flexibility; generous unemployment benefits; and active labour market programs (Belchamber 2010, p. 280). Figure 3.1 shows how these three elements are related in the Danish flexicurity system.

Figure 3.1: The Danish Flexicurity Diagram



Source: from Belchamber (2010, p. 280)

All of these elements mark a departure in Australia. For neoliberals, flexibility in the labour market often means lower wages and greater managerial prerogative in workplaces. In the context of flexicurity, flexibility is intended to enable firms to be more competitive without resort to either of these. Indeed, it takes, as a given, the presence of a strong partnership with unions. It stresses ‘flexibility for workers, not of workers’ (2010, p. 282). The emphasis on flexibility recalls the discussion above about the dynamism of capitalism and the defensive nature of protectionism:

flexible labour markets ...facilitate structural change in the economy over time by enabling firms to re-set production systems in response to competitive pressures in the markets for their output (Belchamber 2010, p. 282).

In the case of unemployment benefits, the flexicurity approach also marks a considerable departure from Australia’s mean-spirited tradition of paltry welfare payments to the unemployed. The scheme aims to top up NewStart benefits by incorporating a form of social insurance, paid for out of a small proportion of the superannuation guarantee. This would see the current paltry replacement rates—about 19 per cent measured against average weekly earnings or 42 per cent measured against the minimum wage—raised to levels comparable with European replacement rates (in the range of 60 to 65 per cent).

It is in the third plank of the flexicurity scheme that the relevance for VET comes to the fore. An active labour market policy contains at its core training and lifelong learning. As Belchamber notes, in regard to the arrow from benefits to active labour market policy (in Figure 3.1):

For some workers—those whose industries and occupations have been affected by structural change, for example—there may be no job openings such as those from which they have been displaced. Soon after losing their jobs, these workers have the capacity (and obligation) to undertake programs of (re)training, whether to upgrade their existing skills or to acquire entirely new skill sets. The (generous) unemployment benefits available to them provide motivation and income support for the duration of the training program (Belchamber 2010, p. 281).

The next arrow is from the active labour market policy to re-employment in the flexible labour market: ‘Equipped with a new or renewed set of skills in demand, and/or having participated in capacity-building work experience programs, unemployed workers re-enter employment in the flexible labour market’ (Belchamber 2010, p. 281).

One can see how this approach to the labour market incorporates both the life-cycle perspective of transitional labour markets and the importance of lifelong learning:

The flexicurity conception is of ‘transitions’ through a multiplicity of alternative states. In a dynamic world—today and increasingly tomorrow—the vast majority of workers will have a succession of jobs with a series of different employers, intermingled with parenting and child care, care for elderly family members, community responsibilities, further study and training, and possibly joblessness. Every worker can reasonably expect to move between different combinations of these and other roles and duties during the course of their working life, in a continuing quest for ‘work-life balance’. Each successive transition shapes the next; success breeds further success, and every failure increases the baggage to be carried into the subsequent transition (Belchamber 2010, p. 281).

Belchamber points out that Australia’s current expenditure on active labour market programs is about 0.34 per cent of GDP and he contrasts this with the Danish equivalent figure of 1.85 per cent (Belchamber 2010, p. 292). Clearly, Australia’s commitment to substantially increase spending on workforce training and retraining would be essential for a system like this to work. Yet the benefits could also be substantial. Belchamber notes that Germany’s outcome following the global financial crisis justified its investment in a serious training commitment:

The rapid expansion of its retraining programs enabled thousands of workers to retain their jobs with shortened working hours plus intensive at-work skills programs. Under these arrangements, for the time spent in training, affected workers’ wages were subsidised by government. This is widely credited with extending the reach of the automatic stabilisers, avoiding any collapse in consumption expenditure, and keeping the German unemployment rate remarkably steady throughout 2009 (Belchamber 2010, p. 286).

3.4 Conclusion: the educator’s burden

In a way, it is reassuring to recognise that the arguments about the marginal productivity of workers carry little weight. It simplifies the task for educators by taking a burden off their shoulders. Meeting the ‘needs of economy’ can be recast as helping modern labour exchanges work better, and providing students with those core technical, cognitive and behavioural skills which their chosen vocation requires. In the case of those students drawn from the ranks of the long-term unemployment, building foundational skills will be the major challenge facing educators.

Second-guessing the ‘future needs of industry’, or anticipating the skills needs of the 22nd century, can be left to economic forecasters and astrologers. It could be argued that the future orientation educators most often required by educators is a broad understanding of the contours of workplace change and how retraining programs slot into this. Cully’s insights about the value of short targeted train courses shows the relevance of this approach (Cully 2005, p. 25).

The higher education sector is locked into an emphasis on credentials: all of its pathways, either into higher degrees or into the professions, place qualifications centre-stage. On the other hand, for VET credentials operate as the certification of skills, as Cully’s study of employer recruitment emphasised. In this context, TAFE is regarded highly.

If there are problems with an overqualified workforce, or with too many low skilled jobs, then there is little that educators can do to fix these problems. Unless this qualifications problem represents a severe mismatch between what the labour market requires and what VET is producing, the responsibility lies elsewhere. We know, for example, that a large number of VET graduates work in areas for which they were not trained, and many of these will surface in the statistics on overqualified workers. But we also that many VET graduates leave their original jobs because of problems with those jobs: such as low pay, poor conditions or disappointed expectations.

As suggested in the last chapter in the discussion of labour market segmentation, workers build ‘shelters’ for themselves, often by means of qualifications or licences. For those in professional occupations, these shelters not only prevent competition, but also allow considerable ‘rent seeking’. This outcome is almost guaranteed by virtue of tight controls over entry, in which the profession itself usually controls the credentialing or the licensing. Lawyers and surgeons come to mind.

There are two reasons why the trades area differs, and why the building of shelters is more a defensive act than one of greed. Generally, the credentialing and licensing is administered externally—by government agencies, for example—and there is no incentive to restrict supply. Secondly, the barriers to entry are more permeable in the trades. It is common for workers without formal qualifications to work in the trades areas, and the ABS labour mobility figures show a steady flow of workers into and out of the trades occupations, partly in response to the ebb and flow of the business cycle.

Nevertheless, it remains the case that erecting labour market shelters remains a defensive strategy and one that has adverse consequences. It has certainly been one way that skilled and semi-skilled workers have defended their wages and conditions, but often at considerable social cost. There are the inefficiencies which the restrictions on entry bring about, particularly when genuine skills shortages arise. Furthermore, it’s essentially a static strategy, and assumes that workers will stay in the same jobs for most of their working lives. Finally, shelters and segments invariably draw upon, and in turn reinforce, social divisions based on gender, race and ethnicity. For much of the 20th century, the skilled artisans of the Australian workplace were predominantly white, male, and of Anglo-Celtic descent. By way of contrast, those jobs which provided few shelters—the process worker jobs which underpinned manufacturing, the cleaning jobs which kept the offices functioning, or the back-of-house jobs which kept the hotels pristine—these jobs were disproportionately filled by non-Anglo-Celtic migrants, mostly women.

This report has suggested that the problems which labour market shelters evolved to deal with have not gone away. Downward pressure on wages and conditions at the bottom of the labour market remains a reality. The economy is still characterised by structural unemployment, under-employment and a large pool of working-age people completely outside the labour force. Together with wage inequality and job insecurity, this polarisation in Australian society undermines social solidarity and violates the social inclusion agenda. Efforts to deal with these problems, within the framework of VET policy, point towards a role for lifelong learning and for stronger linkages between educational institutions and local labour markets. Strategies which enable modern labour exchanges to work efficiently are central to these efforts. If the VET sector can assist workers in gaining the flexibility to move across a range of different jobs during their working lives, it will be providing labour market protections of greater worth than those offered by shelters.

A. Appendix for regression modelling

A.1 The HILDA dataset and modelling approach

The HILDA survey is a household-based longitudinal survey covering a broad range of social and economic questions (for more details, see <http://www.melbourneinstitute.com/hilda/>). Respondents are surveyed each year (called a ‘wave’), generally in the latter half of the year, and respond to both interviewer-administered questionnaires and a self-completion questionnaire. There are a core of questions which remain the same every year, thereby allowing for a valuable accumulation of consistent data on the same individual over time. New individuals are recruited into the survey each wave, allowing the sample size to remain high and compensating for the loss of individuals through attrition.

In the initial wave in 2001 13,969 individuals were interviewed. By 2007, for example, the original core had dropped to 9,628, but recruitment had kept the sample size at 12,789. The use of weights, which reflect both the sample design and the attrition, makes the estimates from the latter years comparable with the earlier years. For a survey of this type, the response rates have been impressive, and comparable with overseas equivalent surveys. Some 86.8 per cent of wave 1 respondents were interviewed in wave 2, and the figures for subsequent years were all above 90 per cent (and closer to 95 per cent).

The modelling which is used for this report pools the data for Waves 3 to 9, the period during which the training question was included in the survey questionnaire. This pooling of the data has methodological implications because all of the individual observations in the data—the person-year observations—are no longer independent. This is one of the key requirements of regression modelling and I discuss below various strategies for dealing with.

The model details shown in the next section contain coefficients as well as 95 per cent confidence intervals. This presentation is consistent with the argument of this report, that uncertainty in modelling should be explicitly revealed. Neither p-values nor standard errors adequately represent uncertainty (unless the reader undertakes mental calculations with the latter). For those readers still wishing to know which coefficients are statistically significant, confidence intervals will answer that question quite easily. If the interval excludes 0, then the result is statistically significant (at the 5 per cent level).

The models which follow begin with a simple ordinary least squares regression model and add more complexity. This takes the form of additional explanatory variables and more sophisticated estimation methods. For example, the Heckman models take account of selection effects, the fact that not all persons in the sample are observed in the wage equation. The statistic shown below (‘lambda’) is one measure of

the extent to which a selection effect is evident. If this is statistically significant, then a selection effect is evident and employing the Heckman approach is warranted. Both the regression models and the Heckman models make use of 'sandwich estimators', which is method for ensuring that the standard errors are robust and take account of the lack of independence between observations (that is, the repeat observations on the same individuals).

The panel data model takes the form of a mixed-effects model, in which there is a fixed component and a random component (for more details, see, Pinheiro and Bates 2004; Gelman and Hill 2007) The explanatory variables (age, education and so forth) are modelled as fixed effects and the individual persons are random effects. This produces a 'random intercept' model (though one can also include explanatory variables as random effects and produce a 'random coefficient' model). There are a number of advantages to this modelling approach. First, it deals with the lack of independence among observations in the pooled data (the reason for using the sandwich estimator in the earlier models). Secondly, it adjusts the fixed effects coefficients to accommodate this dependency (which is not done with the sandwich estimator approach), and finally it also provides additional information about the residual structure of the model.

In a panel data model like this the person-year observations can be thought of as 'earnings episodes' and the individual persons can be thought of as 'groups'. Consequently, the residual structure (the total variance) can be divide into a component due to variability around each earnings episode and a component due to variability between individuals ('groups'). The proportion of the variance due to the latter is usually expressed as the 'rho' statistic. A high value here indicates that a lot of the variability in the outcome is due to differences between individuals, rather than differences across the years for the same individuals.

A.2 Modelling results

Table A.1: Conventional linear regression: model 1

	Male			Female		
	Coefficient	Lower bound	Upper bound	Coefficient	Lower bound	Upper bound
Bachelor or above	0.5375	0.4930	0.5820	0.4579	0.4188	0.4969
Adv diploma, diploma	0.3134	0.2576	0.3692	0.2651	0.2168	0.3133
Certificate III/IV	0.1896	0.1496	0.2297	0.1226	0.0797	0.1655
Certificate I/II NFD	-0.0771	-0.2304	0.0763	-0.0603	-0.1556	0.0350
Year 12	0.2186	0.1618	0.2753	0.1640	0.1179	0.2101
Experience	0.0311	0.0258	0.0364	0.0270	0.0211	0.0329
Experience squared	-0.0005	-0.0006	-0.0004	-0.0004	-0.0006	-0.0003
Usual weekly hours	0.0283	0.0265	0.0302	0.0359	0.0346	0.0372
Weeks employed in year	0.0325	0.0292	0.0357	0.0343	0.0319	0.0367
Intercept	7.4263	7.2396	7.6129	6.9734	6.8379	7.1089
Number of observations	16,987			17,268		
R-squared	.40			.57		

Notes: Estimation by ordinary least squares regression with robust standard errors (to account for repeated observations). 95 per cent confidence intervals shown. Note that the estimates in Table 1.6 are percentage premiums and do not exactly match these coefficients (since they are converted from these model coefficients using the formula: $100 * (\text{exponent}(\text{coefficient}) - 1)$.)

Outcome variable is the log of annual wage and salary income. Omitted categories for education is Year 11 and below. Experience is measured as years in paid work.

Source: HILDA Release 9. Population: Employees aged 25 to 64 who reported annual earnings, 2003 to 2009.

Table A.2: Conventional linear regression: model 2

	Male			Female		
	Coefficient	Lower bound	Upper bound	Coefficient	Lower bound	Upper bound
Bachelor or above	0.3654	0.3152	0.4156	0.2910	0.2465	0.3356
Adv diploma, diploma	0.2086	0.1525	0.2647	0.1722	0.1248	0.2195
Certificate III/IV	0.1467	0.1067	0.1868	0.1005	0.0591	0.1418
Certificate I/II NFD	-0.0770	-0.2208	0.0669	-0.0611	-0.1543	0.0321
Year 12	0.1543	0.1000	0.2086	0.1142	0.0712	0.1573
Experience	0.0296	0.0245	0.0347	0.0233	0.0175	0.0291
Experience squared	-0.0005	-0.0006	-0.0004	-0.0004	-0.0005	-0.0002
Usual weekly hours	0.0266	0.0248	0.0285	0.0344	0.0331	0.0357
Weeks employed in year	0.0313	0.0281	0.0345	0.0333	0.0310	0.0357
Professionals	-0.0306	-0.0744	0.0131	0.0374	-0.0098	0.0847
Technicians and trades	-0.1818	-0.2260	-0.1377	-0.2046	-0.2754	-0.1338
Service workers	-0.1529	-0.2083	-0.0975	-0.2150	-0.2720	-0.1580
Clerical workers	-0.1808	-0.2283	-0.1333	-0.0876	-0.1357	-0.0395
Salesworkers	-0.2756	-0.3351	-0.2161	-0.2567	-0.3167	-0.1967
Machinery and transport	-0.2445	-0.2952	-0.1938	-0.1980	-0.3177	-0.0784
Labourers	-0.4149	-0.4748	-0.3549	-0.3912	-0.4667	-0.3156
Intercept	7.8134	7.6209	8.0059	7.2943	7.1454	7.4431
Number of observations	16,980			17,260		
R-squared	.43			.57		

Notes: See notes to Table A.1 above.

Outcome variable is the log of annual wage and salary income. Omitted categories for education is Year 11 and below and for occupation it is managers. Experience is measured as years in paid work.

Source: HILDA Release 9. Population: Employees aged 25 to 64 who reported annual earnings, 2003 to 2009.

Table A.3: Conventional linear regression: model 3

	Male			Female		
	Coefficient	Lower bound	Upper bound	Coefficient	Lower bound	Upper bound
Bachelor or above	0.3286	0.2744	0.3827	0.2193	0.1760	0.2626
Adv diploma, diploma	0.1629	0.1090	0.2168	0.1190	0.0732	0.1648
Certificate III/IV	0.0916	0.0554	0.1278	0.0631	0.0238	0.1023
Certificate I/II NFD	-0.0998	-0.2513	0.0517	-0.0934	-0.1926	0.0058
Year 12	0.1076	0.0551	0.1602	0.0681	0.0258	0.1104
Experience	0.0344	0.0219	0.0469	0.0277	0.0189	0.0364
Experience squared	-0.0002	-0.0005	0.0000	-0.0004	-0.0006	-0.0002
Age	0.0012	-0.0239	0.0264	-0.0141	-0.0289	0.0008
Age squared	-0.0003	-0.0006	0.0000	0.0001	-0.0001	0.0002
Usual weekly hours	0.0211	0.0192	0.0230	0.0299	0.0285	0.0313
Weeks employed in year	0.0257	0.0222	0.0292	0.0310	0.0285	0.0334
Professionals	-0.0384	-0.0815	0.0046	0.0082	-0.0375	0.0539
Technicians and trades	-0.1693	-0.2123	-0.1262	-0.1795	-0.2482	-0.1107
Service workers	-0.1992	-0.2526	-0.1458	-0.1891	-0.2459	-0.1323
Clerical workers	-0.1925	-0.2406	-0.1444	-0.0725	-0.1212	-0.0238
Salesworkers	-0.2295	-0.2900	-0.1691	-0.2248	-0.2868	-0.1628
Machinery and transport	-0.2143	-0.2619	-0.1667	-0.1660	-0.2964	-0.0357
Labourers	-0.3234	-0.3824	-0.2644	-0.2771	-0.3530	-0.2011
Balance of NSW	-0.1128	-0.1592	-0.0663	-0.1084	-0.1537	-0.0631
Melbourne	-0.0213	-0.0680	0.0255	-0.1025	-0.1441	-0.0608
Balance of Victoria	-0.1839	-0.2457	-0.1222	-0.1641	-0.2234	-0.1048
Brisbane	-0.0770	-0.1246	-0.0294	-0.0932	-0.1392	-0.0472
Balance of QLD	-0.0953	-0.1448	-0.0458	-0.1403	-0.1879	-0.0928
Adelaide	-0.1367	-0.1991	-0.0743	-0.1106	-0.1716	-0.0495
Balance of SA	-0.1152	-0.2062	-0.0243	-0.1943	-0.2830	-0.1055
Perth	-0.0106	-0.0726	0.0514	-0.0932	-0.1494	-0.0369
Balance of WA	0.0233	-0.0648	0.1114	-0.1358	-0.2470	-0.0247
Tasmania	-0.1693	-0.2539	-0.0847	-0.0932	-0.1545	-0.0318
Northern Territory	0.0083	-0.1011	0.1176	0.0794	-0.0275	0.1862
ACT	0.0382	-0.0371	0.1134	0.0141	-0.0708	0.0991
Occupational tenure	0.0044	0.0030	0.0057	0.0041	0.0028	0.0055
Job tenure	0.0002	-0.0017	0.0021	-0.0002	-0.0022	0.0019
Union member	-0.0790	-0.1070	-0.0509	-0.0415	-0.0683	-0.0146
Casual employee	0.1539	0.1029	0.2050	0.1897	0.1507	0.2288
Private sector	-0.0646	-0.0975	-0.0317	0.0106	-0.0181	0.0393
Organisational size: 20–99	0.1263	0.0893	0.1634	-0.0146	-0.0547	0.0256
Organisational size: 100–499	0.1831	0.1448	0.2215	0.0536	0.0143	0.0928
Organisational size: 500 plus	0.2661	0.2305	0.3017	0.0777	0.0408	0.1146
Supervisor	-0.0855	-0.1082	-0.0628	-0.0597	-0.0814	-0.0380
Year 2004	0.0040	-0.0183	0.0263	0.0188	-0.0080	0.0456
Year 2005	0.0295	0.0046	0.0545	0.0097	-0.0195	0.0388
Year 2006	0.0382	0.0157	0.0607	0.0539	0.0258	0.0820
Year 2007	0.0634	0.0380	0.0887	0.0931	0.0647	0.1216
Year 2008	0.0798	0.0538	0.1058	0.0774	0.0470	0.1078
Year 2009	0.1302	0.1045	0.1560	0.1250	0.0949	0.1550
Received training	-0.0202	-0.0393	-0.0012	-0.0150	-0.0341	0.0042
Learnt new skills in job	0.0106	0.0031	0.0180	0.0071	0.0002	0.0140
Intercept	8.2496	7.7911	8.7081	7.8094	7.5044	8.1144
Number of observations	15,039			15,640		
R-squared	.48			.60		

Notes: See notes to Table A.1 above.

Outcome variable is the log of annual wage and salary income. Omitted categories are: Year 11 and below; managers; Sydney; Not a union member; Not a casual employee; Organisational size: under 20; Year 2003; Didn't receive training. Experience is measured as years in paid work, Learnt new skills in job is scaled from 1 (low) to 7 (high).

Source: HILDA Release 9. Population: Employees aged 25 to 64 who reported annual earnings, 2003 to 2009.

Table A.4: Heckman selection approach: model 4

	Male			Female		
	Coefficient	Lower bound	Upper bound	Coefficient	Lower bound	Upper bound
Bachelor or above	0.4178	0.3848	0.4507	0.3753	0.3467	0.4038
Adv diploma, diploma	0.2510	0.2123	0.2898	0.2069	0.1735	0.2403
Certificate III/IV	0.1344	0.1055	0.1632	0.0694	0.0393	0.0995
Certificate I/II NFD	-0.1092	-0.1925	-0.0258	-0.0672	-0.1305	-0.0039
Year 12	0.1762	0.1392	0.2133	0.1221	0.0913	0.1528
Experience	0.0273	0.0236	0.0309	0.0246	0.0210	0.0282
Experience squared	-0.0002	-0.0003	-0.0001	-0.0003	-0.0004	-0.0002
Usual weekly hours	0.0273	0.0265	0.0281	0.0348	0.0341	0.0355
Weeks employed in year	0.0317	0.0303	0.0332	0.0339	0.0327	0.0350
Intercept	7.8637	7.7644	7.9630	7.2244	7.1433	7.3055
Lambda	-.7046	-.7926	-.6165	-.2347	-.2799	-.1895
Total number of observations	27,084			30,298		
Number obs in wage equation	16,981			17,264		

Notes: Estimation by maximum likelihood estimation with robust standard errors (to account for repeated observations). The selection equation consisted of the following variables: age, age squared, educational qualifications, marital status, number of children aged 0 to 4, number of children aged 5 to 9, number of children aged 10 to 14, geographical location. Identification was ensured by inclusion of the marital status and children variables. Lambda is the Heckman 'selection effect'. Coefficients for the selection equation are not shown but are available on request.

95 per cent confidence intervals shown. As noted above, the estimates in Table 1.6 are percentage premiums and do not exactly match these coefficients (since they are converted from these model coefficients using the formula: $100 * (\text{exponent}(\text{coefficient}) - 1)$.)

Outcome variable is the log of annual wage and salary income. Omitted categories for education is Year 11 and below. Experience is measured as years in paid work.

Source: HILDA Release 9. *Population:* Employees aged 25 to 64 who reported annual earnings, 2003 to 2009.

Table A.5: Heckman selection approach: model 5

	Male			Female		
	Coefficient	Lower bound	Upper bound	Coefficient	Lower bound	Upper bound
Bachelor or above	0.2585	0.2231	0.2938	0.1982	0.1657	0.2307
Adv diploma, diploma	0.1555	0.1170	0.1940	0.1073	0.0732	0.1415
Certificate III/IV	0.0979	0.0692	0.1265	0.0424	0.0119	0.0728
Certificate I/II NFD	-0.1068	-0.1874	-0.0262	-0.0685	-0.1308	-0.0062
Year 12	0.1184	0.0821	0.1546	0.0685	0.0379	0.0991
Experience	0.0262	0.0226	0.0297	0.0207	0.0171	0.0242
Experience squared	-0.0002	-0.0003	-0.0001	-0.0003	-0.0003	-0.0002
Usual weekly hours	0.0257	0.0249	0.0265	0.0332	0.0324	0.0339
Weeks employed in year	0.0306	0.0292	0.0320	0.0329	0.0317	0.0340
Professionals	-0.0246	-0.0517	0.0024	0.0399	0.0062	0.0735
Technicians and trades	-0.1762	-0.2048	-0.1476	-0.2077	-0.2600	-0.1554
Service workers	-0.1533	-0.1910	-0.1157	-0.2168	-0.2553	-0.1784
Clerical workers	-0.1867	-0.2198	-0.1535	-0.0901	-0.1245	-0.0558
Salesworkers	-0.2686	-0.3091	-0.2280	-0.2618	-0.3045	-0.2191
Machinery and transport	-0.2316	-0.2628	-0.2004	-0.2060	-0.2892	-0.1227
Labourers	-0.3971	-0.4319	-0.3623	-0.3945	-0.4392	-0.3498
Intercept	8.2056	8.1035	8.3076	7.5694	7.4805	7.6583
Lambda	-0.6551	-0.7407	-0.5694	-0.2532	-0.2977	-0.2087
Total number of observations	27,077			30,290		
Number obs in wage equation	16,974			17,256		

Notes: See notes to Table A.4 above.

Outcome variable is the log of annual wage and salary income. Omitted categories for education is Year 11 and below and for occupation it is managers. Experience is measured as years in paid work.

Source: HILDA Release 9. Population: Employees aged 25 to 64 who reported annual earnings, 2003 to 2009.

Table A.6: Heckman selection approach: model 6

	Male			Female		
	Coefficient	Lower bound	Upper bound	Coefficient	Lower bound	Upper bound
Bachelor or above	0.2842	0.2469	0.3216	0.1083	0.0742	0.1425
Adv diploma, diploma	0.1402	0.1054	0.1749	0.0410	0.0060	0.0761
Certificate III/IV	0.0739	0.0479	0.0999	-0.0072	-0.0387	0.0243
Certificate I/II NFD	-0.1052	-0.1774	-0.0330	-0.1075	-0.1694	-0.0455
Year 12	0.0928	0.0607	0.1249	0.0172	-0.0142	0.0487
Experience	0.0339	0.0277	0.0402	0.0291	0.0241	0.0341
Experience squared	-0.0002	-0.0003	-0.0001	-0.0004	-0.0005	-0.0003
Age	-0.0057	-0.0187	0.0073	-0.0341	-0.0443	-0.0239
Age squared	-0.0001	-0.0003	0.0000	0.0003	0.0002	0.0004
Usual weekly hours	0.0210	0.0201	0.0219	0.0283	0.0275	0.0291
Weeks employed in year	0.0256	0.0242	0.0271	0.0302	0.0291	0.0314
Professionals	-0.0390	-0.0663	-0.0117	0.0057	-0.0295	0.0408
Technicians and trades	-0.1691	-0.1988	-0.1394	-0.1841	-0.2371	-0.1310
Service workers	-0.1989	-0.2376	-0.1603	-0.1956	-0.2350	-0.1562
Clerical workers	-0.1923	-0.2258	-0.1588	-0.0768	-0.1118	-0.0418
Salesworkers	-0.2285	-0.2693	-0.1876	-0.2331	-0.2764	-0.1899
Machinery and transport	-0.2126	-0.2460	-0.1793	-0.1732	-0.2602	-0.0862
Labourers	-0.3220	-0.3585	-0.2855	-0.2860	-0.3323	-0.2397
Balance of NSW	-0.0986	-0.1298	-0.0675	-0.0855	-0.1182	-0.0528
Melbourne	-0.0263	-0.0530	0.0005	-0.1084	-0.1373	-0.0795
Balance of Victoria	-0.1728	-0.2104	-0.1352	-0.1514	-0.1910	-0.1118
Brisbane	-0.0905	-0.1226	-0.0584	-0.1047	-0.1388	-0.0707
Balance of QLD	-0.0828	-0.1147	-0.0508	-0.1325	-0.1659	-0.0992
Adelaide	-0.1283	-0.1657	-0.0908	-0.1135	-0.1536	-0.0734
Balance of SA	-0.0845	-0.1403	-0.0287	-0.1624	-0.2207	-0.1041
Perth	-0.0004	-0.0361	0.0354	-0.0724	-0.1124	-0.0325
Balance of WA	0.0418	-0.0136	0.0972	-0.0659	-0.1349	0.0030
Tasmania	-0.1512	-0.2024	-0.1001	-0.1099	-0.1611	-0.0588
Northern Territory	-0.0084	-0.0953	0.0785	0.0424	-0.0467	0.1316
ACT	0.0214	-0.0328	0.0756	-0.0106	-0.0713	0.0500
Occupational tenure	0.0044	0.0034	0.0054	0.0043	0.0032	0.0055
Job tenure	0.0002	-0.0010	0.0013	-0.0000	-0.0015	0.0014
Union member	-0.0784	-0.0971	-0.0598	-0.0433	-0.0639	-0.0226
Casual employee	0.1532	0.1233	0.1830	0.1993	0.1745	0.2241
Private sector	-0.0655	-0.0868	-0.0443	0.0099	-0.0110	0.0307
Organisational size: 20–99	0.1262	0.0990	0.1535	-0.0093	-0.0391	0.0205
Organisational size: 100–499	0.1835	0.1571	0.2099	0.0575	0.0295	0.0856
Organisational size: 500 plus	0.2655	0.2412	0.2899	0.0839	0.0581	0.1097
Supervisor	-0.0852	-0.1022	-0.0682	-0.0633	-0.0812	-0.0454
Year 2004	0.0033	-0.0249	0.0315	0.0194	-0.0113	0.0501
Year 2005	0.0289	0.0005	0.0572	0.0112	-0.0195	0.0418
Year 2006	0.0374	0.0092	0.0657	0.0547	0.0243	0.0851
Year 2007	0.0620	0.0334	0.0905	0.0948	0.0642	0.1254
Year 2008	0.0787	0.0500	0.1074	0.0803	0.0496	0.1110
Year 2009	0.1293	0.1007	0.1578	0.1277	0.0969	0.1585
Received training	-0.0204	-0.0371	-0.0038	-0.0129	-0.0309	0.0051
Learnt new skills in job	0.0105	0.0055	0.0156	0.0072	0.0020	0.0124
Intercept	8.4725	8.2113	8.7337	8.4870	8.2584	8.7156
Lambda	-.2027	-.3028	-.1027	-.3000	-.3491	-.2509
Total number of observations	25,140			28,671		
Number obs in wage equation	15,037			15,637		

Notes: See notes to Table A.4 above. Outcome variable is the log of annual wage and salary income. Omitted categories are: Year 11 and below; managers; Sydney; Not a union member; Not a casual employee; Organisational size: under 20; Year 2003; Didn't receive training. Experience is measured as years in paid work, Learnt new skills in job is scaled from 1 (low) to 7 (high).

Source: HILDA Release 9. *Population:* Employees aged 25 to 64 who reported annual earnings, 2003 to 2009.

Table A.7: Panel data: model 7

	Male			Female		
	Coefficient	Lower bound	Upper bound	Coefficient	Lower bound	Upper bound
Bachelor or above	0.4654	0.4186	0.5121	0.3116	0.2666	0.3566
Adv diploma, diploma	0.2304	0.1776	0.2831	0.1793	0.1258	0.2328
Certificate III/IV	0.1306	0.0919	0.1692	0.0868	0.0426	0.1309
Certificate I/II NFD	-0.0364	-0.1331	0.0603	-0.1199	-0.2158	-0.0239
Year 12	0.1811	0.1306	0.2316	0.0846	0.0345	0.1346
Experience	0.0565	0.0468	0.0662	0.0411	0.0334	0.0488
Experience squared	-0.0004	-0.0006	-0.0002	-0.0005	-0.0007	-0.0004
Age	-0.0064	-0.0248	0.0121	-0.0268	-0.0410	-0.0125
Age squared	-0.0003	-0.0005	-0.0001	0.0002	-0.0000	0.0003
Usual weekly hours	0.0143	0.0133	0.0153	0.0236	0.0227	0.0245
Weeks employed in year	0.0239	0.0227	0.0251	0.0293	0.0282	0.0303
Professionals	-0.0069	-0.0339	0.0201	-0.0005	-0.0370	0.0361
Technicians and trades	-0.0719	-0.1027	-0.0410	-0.1579	-0.2181	-0.0977
Service workers	-0.0864	-0.1299	-0.0429	-0.1339	-0.1768	-0.0910
Clerical workers	-0.0764	-0.1080	-0.0449	-0.0408	-0.0776	-0.0039
Salesworkers	-0.1115	-0.1519	-0.0710	-0.1482	-0.1943	-0.1022
Machinery and transport	-0.0958	-0.1316	-0.0600	-0.1044	-0.1978	-0.0110
Labourers	-0.1269	-0.1638	-0.0900	-0.2231	-0.2761	-0.1701
Balance of NSW	-0.1454	-0.1931	-0.0977	-0.1189	-0.1715	-0.0662
Melbourne	-0.0245	-0.0685	0.0194	-0.0825	-0.1299	-0.0352
Balance of Victoria	-0.1917	-0.2508	-0.1326	-0.1518	-0.2150	-0.0885
Brisbane	-0.0790	-0.1294	-0.0285	-0.0800	-0.1351	-0.0249
Balance of QLD	-0.1156	-0.1647	-0.0666	-0.1190	-0.1730	-0.0651
Adelaide	-0.1672	-0.2275	-0.1069	-0.0795	-0.1463	-0.0127
Balance of SA	-0.1679	-0.2527	-0.0831	-0.2683	-0.3610	-0.1756
Perth	-0.0148	-0.0720	0.0424	-0.0788	-0.1436	-0.0140
Balance of WA	-0.0319	-0.1155	0.0517	-0.1756	-0.2825	-0.0687
Tasmania	-0.2508	-0.3335	-0.1682	-0.1146	-0.2030	-0.0263
Northern Territory	-0.0614	-0.1729	0.0500	0.1089	-0.0207	0.2385
ACT	0.0301	-0.0472	0.1075	-0.0181	-0.1106	0.0745
Occupational tenure	0.0018	0.0008	0.0028	0.0026	0.0014	0.0038
Job tenure	0.0015	0.0001	0.0029	0.0019	0.0000	0.0037
Union member	-0.0681	-0.0892	-0.0469	-0.0413	-0.0652	-0.0173
Casual employee	0.1038	0.0754	0.1322	0.1291	0.1033	0.1550
Private sector	-0.0319	-0.0584	-0.0053	0.0107	-0.0148	0.0362
Organisational size: 20–99	0.0633	0.0369	0.0897	-0.0044	-0.0353	0.0266
Organisational size: 100–499	0.1196	0.0931	0.1461	0.0450	0.0148	0.0752
Organisational size: 500 plus	0.1569	0.1310	0.1827	0.0662	0.0371	0.0953
Supervisor	-0.0632	-0.0793	-0.0470	-0.0443	-0.0625	-0.0260
Year 2004	0.0127	-0.0073	0.0327	0.0158	-0.0083	0.0399
Year 2005	0.0394	0.0190	0.0597	0.0185	-0.0059	0.0429
Year 2006	0.0568	0.0362	0.0774	0.0637	0.0392	0.0883
Year 2007	0.0874	0.0662	0.1086	0.1006	0.0755	0.1257
Year 2008	0.1102	0.0885	0.1319	0.0972	0.0716	0.1229
Year 2009	0.1588	0.1368	0.1808	0.1482	0.1220	0.1743
Received training	-0.0031	-0.0170	0.0108	-0.0146	-0.0311	0.0020
Learnt new skills in job	0.0061	0.0013	0.0109	0.0035	-0.0018	0.0088
Intercept	8.6124	8.2916	8.9332	8.2399	7.9653	8.5145
Rho	.5950			.5361		
Number of observations	15,039			15,640		
Number of groups	3,755			3,934		

Notes: Estimation by generalised least squares regression for a random intercept model. Individual persons are the ‘group’ and earnings ‘episodes’ are the individual observations in the model. Rho shows the proportion of the total variance accounted for by persons. Omitted categories are the same as for model 6.

Source: HILDA Release 9. Population: Employees aged 25 to 64 who reported annual earnings, 2003 to 2009.

Notes

1. Casual status is usually included in most regression models as a dummy variable, but modification of the earnings variable to take account of these loadings is rarely done. For exceptions to this practice see Dunlop (2001); Watson (2005).
2. Leigh pooled the data and did not exploit the panel nature of the survey. He did take account of the clustered nature of the data in his estimation of the standard errors (Leigh 2008, p. 237).
3. Among the training categories available in this data set are: on-the-job training, in-house training and external training courses; as well as details on time spent in training and costs incurred.
4. One could also argue the case that one should fit a panel model which takes account of selection effects, though the counter argument runs that selection is less of an issue with panel data since each individual is much more likely to be observed over the course of a large number of waves. Baron2008 argue, for example, that selection effects are more of a problem with cross-sectional data than panel data (2008, p. 8).
5. I do mean to suggest the regression framework is without controversy. The notion of 'net effects', with all other influences held constant, can be challenged on both philosophical and methodological grounds (see, for example, Ragin and Fiss 2009).
6. Traditional notions that the brain becomes hard-wired have been challenged in recent years and the idea of a malleable brain has gained considerable credibility.
7. For a fuller discussion of these issues, see Wooldridge (2002); Hsiao (2003).
8. '...governments are not profit-maximisers and hence can produce any output of public services that Parliament approves. Governments may or may not utilise labour efficiently within a given budget, but the size of the budget itself lacks any economic rationale. Thus, to talk about the marginal productivity of the civil service is to abuse technical language' (Blaug 1972, p. 61).
9. These calculations are for 2009 and are weighted estimates from Wave 9 of the HILDA survey.
10. The ABS notes that they can use either average wages, or predicted wages from fitting a classic earnings functions (based on educational attainment and proxied work-force experience). Both give the same results.

11. The NAIRU is the acronym for the non-accelerating rate of unemployment. This concept relies on assumptions about employment levels and the transmission of wage costs through the economy which have been rarely explored rigorously. See DeBelle and Vickery (1998) for an example of its use and Mitchell (1998) and Galbraith (1998) for critiques of the concept.
12. Writing in 2008, prior to the global financial crisis, I argued: “Wage movements over the last few years, with the notable exception of mining, have not been consistent with the growth of major labour shortages or a ‘skills crisis’. In 2004–2005 wages grew at an annual rate of 3.8 per cent. This figure rose to 4.1 per cent in 2005–2006 and then fell back to 4.0 per cent in 2006–2007. Over this same period, annual wages growth in mining rose from 4.0 per cent to 6.1 per cent (March 2008, ABS6345.0). These are nominal rates, and do not take account of inflation, which grew at 2.4 per cent over 2004–2005, at 3.2 per cent over 2005–2006 and at 2.9 per cent over 2006–2007”. (Watson 2008*b*, p. 7).
13. This section draws heavily on previous research, see Watson (2008*b*).
14. Research by Voon and Miller (2005), using 1996 Census data, arrived at a lower estimate of overeducation—16 per cent for men and 14 per cent for women—while research by Kler (2005) put the figure for graduates at between 21 and 46 per cent.
15. These figures for wage penalties are as reported by Mavromaras et al. (2009) and match their model coefficients. They do not appear to have converted them to percentages using the standard formula ($100 * (\text{exponent}(\text{coefficient}) - 1)$) but given their small magnitude this does not affect the substantive results.
16. The authors concede that their research does not consider labour demand and that ‘there is a general dearth of research in the area of labour demand by post-school educational pathway’ (Mavromaras et al. 2010, p. 27).
17. The Job Compact guaranteed every unemployed person who had been on benefits for 18 months or more a full-time job for at least twelve months. Employment was to be mainly in the private sector, but could include the public or community sectors. They were to be paid a training wage during this period and were obliged to enter into individual case management (see Davidson 2011, p. 61; Junankar and Kapuscinski 1998, p. 25).
18. See Peter Davidson’s recent overview of the ‘work first’ programs premised on the OECD activation philosophy (Davidson 2011).
19. This material is taken from an earlier project which looked at the working poor. (see Watson 1993).

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