HECS FOR TAFE: THE CASE FOR EXTENDING INCOME CONTINGENT LOANS TO THE VOCATIONAL EDUCATION AND TRAINING SECTOR

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ABSTRACT

The public vocational education and training (VET) system is now one of the few areas in Australia's tertiary education system where students are required to pay up-front fees without access to loan assistance. These arrangements may lead to sub-optimal educational outcomes to the extent that prospective students reject a VET education on the basis of short-term financial constraints. In this paper we present a case for introducing an income contingent loan to the VET sector. The economic rationale is similar to that for higher education, and the Higher Education Contribution Scheme (HECS) provides a useful template. Using data from the first three waves of the Household Income and Labour Dynamics in Australia (HILDA) survey, we establish that there are indeed significant private returns to VET qualifications. An income contingent loan is argued to enhance access to these benefits, and the collection streams are analysed for different qualifications. The form that an income contingent loan might take for VET is considered, as are the implications for the Commonwealth Government with respect to potential subsidies associated with the design parameters.

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1.   INTRODUCTION

Australia's public vocational education and training (VET) system now sits in what is arguably a strange place amongst the nation's post compulsory education providers. Since the introduction of FEE-HELP in 2005, and its subsequent extension to an increasing number of eligible private higher education providers, the public VET system is now one of a few areas of tertiary education in which many students are required to pay up-front fees without access to loan assistance.

The economic case for an income contingent loan for the VET sector is as familiar as is this case for higher education, where such loans have been available since 1989. This takes the form of Commonwealth supported university courses under the guise of the Higher Education Contribution Scheme (now known as HECS-HELP), and since 2005, via FEE-HELP for non-Commonwealth funded courses at universities and eligible private higher education providers. Some might argue that the distinction in financing arrangements between VET and higher education seems somewhat arbitrary given the breadth of courses eligible for FEE-HELP. The central issue is that up-front fees, without the provision of an income contingent loan, sit uneasily with economic theory.

In this paper we evaluate VET in terms of returns to human capital investments, and assess the implications for this investment of introducing a HECS-style income contingent loan. To anticipate our results, we find significant private returns to the acquisition of higher level VET qualifications. This suggests that there is a potential to have contributions from students through HECS-type arrangements. Further, introducing a HECS-style income contingent loan into the VET sector would be administratively straightforward to implement given that the infrastructure is largely already in place.

The remainder of this paper proceeds as follows. The next section provides a broad overview of current course fees in Australia's public VET system. Section 3 establishes the theoretical case for income contingent loans while section 4 reviews Australia's experience with HECS. Section 5 introduces the concept of the internal rate of return to estimate the benefits of VET education, and section 6 analyses the impact of introducing an income contingent loan into the VET sector. In section 7 we consider how an income contingent loan might be extended to the VET sector in practical terms, and section 8 concludes.

2. CHANGES IN VET FEES AND THE INCIDENCE OF CONCESSIONS AND EXEMPTIONS

In this section we consider recent developments in course fees for VET education, and the prevalence of concessions and exemptions, in order to frame the debate. To the extent that course costs are significant, then up-front fees may prohibit participation in the VET sector. Given the range of courses available under the VET banner, we consider a selection of Technical and Further Education (TAFE) courses to proxy developments in public sector VET courses more generally.

With increased emphasis on the economic goals, and benefits, of tertiary education, have come increases in tuition fees charged by TAFE institutes. In 2003 the maximum TAFE fees for diploma programmes funded by governments ranged from \$500 in Victoria to \$1,200 in South Australia (Watson 2003). In 2005 the maximum fees for government funded programmes ranged from \$900 in Tasmania to \$1,224 in NSW. Restrictions on places funded by the government and the high cost of qualified teachers, facilities, equipment or materials in some areas have led several institutes to offer 'fee for service' or full fee-paying programmes. Many of these are in the 'new economy' areas where growth is fastest but the capacity to expand is lowest.

Thus Brisbane's Southbank Institute offers its Diploma of Multimedia for full fees (full rate \$6,060, concession rate \$5,362) because of the very high equipment and teaching costs of the programme. Perth's Central TAFE charges a tuition fee of \$4,000 for its Diploma of Aromatherapy of 480 hours, which is somewhat less than full time for one year. For its Certificate IV in assessment and workplace training, Melbourne's Holmesglen Institute of TAFE charges \$800 for 210 student contact hours, or about \$1,900 for a full-time load. Adelaide Institute of TAFE's Certificate III in hospitality (commercial cookery), charges high fees (\$3,167 for 6 months) because of the high cost of materials for the programme.

There are no data on the extent of full fee paying programmes offered by TAFE institutes, but State officials believe they are growing (Watson 2003). Student fees and charges were \$197.7 million or 4.3 per cent of all Australian TAFE revenue in 2003 (NCVER 2004). All States and Territories offer fee concessions or exemptions to members of particular demographic groups. TAFE generally does not charge fees for adult literacy and labour market programmes and some jurisdictions give concessions to apprentices or trainees. However, simplifying,

the States and Territories give fee exemptions and concessions to three main groups: Aboriginal and Torres Strait Islanders (ATSI), recipients of AUSTUDY and the youth allowance — student (AUSTUDY), and recipients of Commonwealth income support (pensioners). NSW and the Northern Territory exempt all members from these groups from TAFE tuition fees. Victoria charges Indigenous Australians and recipients of Commonwealth income support a single tuition fee of $50, and charges recipients of income support for students 50 per cent of the standard fee. The other jurisdictions charge a proportion of the standard fee ranging from 25 per cent (Queensland) to 53 per cent (Western Australia), and some jurisdictions also have caps, typically of $250 to $440 for a full year's study load. In addition, all jurisdictions give institute directors the discretion to waive fees for students who are considered to suffer extreme hardship. These arrangements are summarised in Table 1.

Table 1: State and Territory TAFE tuition fee exemptions and concessions for Diploma and above students

State	ATSI	AUSTUDY	Pensioners
NSW	Free	Free	Free
Victoria	$50	50% of standard fee	$50
Queensland	25% of standard fee	25% of standard fee	25% of standard fee
Western Australia	53% of standard fee	53% of standard fee	53% of standard fee
South Australia	50% of standard fee	50% of standard fee	50% of standard fee
Tasmania	33% of standard fee	33% of standard fee	33% of standard fee
Northern Territory	Free	Free	Free
ACT	50% of standard fee	50% of standard fee	50% of standard fee

Source: Watson 2003

3.   THE PROBLEMS WITH UP-FRONT FEES FOR VET

3.1   Income contingent repayment and the failure of capital markets

The first economic problem associated with charging up-front fees for VET is that for those who cannot afford to pay, there is only an ineffective capital market available from which to borrow. The concern of a bank lending for human capital investments is that, unlike many other purchases from a prospective debtor, there is no saleable collateral in the event of default — such as would be the case for the housing capital market — and there is no slavery market in which to sell the human capital being developed.

The other problem for banks lending to students relates to collection costs in the event of default, an issue which assumes significant importance given the absence of collateral. The governments of many countries address these problems by acting as a guarantor for student loans, and by paying the interest for the period before graduation. The problem inherent in this approach is that because the loans are government guaranteed, high default rates imply additional government subsidies, which can be very high. In the US, for example, the associated costs of uncollected debt are particularly significant for those borrowing to finance vocational training.

Further, loans are usually only made available to people from poor families, or those who can establish independence through satisfying a complex set of conditions related to age and/or work experience. This suggests that some prospective students who need financial assistance because their families do not provide help will be unable to access the system. That is, the financial barrier will not be completely removed through means testing allowing concessions or

free entry, because when this is conditional on family income, as is the current VET policy, such an approach presupposes that parents or partners are actually willing and able to share resources. If that assumption does not hold, the use of family income to determine support is a flawed criterion and means that some prospective students will be excluded even if their family income is relatively high. In essence, the idea of means tested loan arrangements based on family income relies on the assumption of willingness to help within the family, and can thus fail because of it.

The central point about access is that the high cost of participating in VET (both through direct living costs and foregone income), combined with a lack of family and capital market sources of finance, potentially creates a significant barrier for many students which is necessarily exacerbated through the imposition of up-front fees. However, schemes such as HECS, and other feasible income contingent repayment arrangements, are likely to considerably diminish these problems because they reduce the importance of the financial situation of the prospective student's family.

3.2 Income contingent repayment and default protection

Given the financing problem recognised above for VET, some policy commentators might be tempted to suggest the traditional solution of a loans system made available through the private banks with a government guarantee. However, making repayments conditional on future income has a special advantage over other typical debt repayment schemes, a point now explored.

One advantage of an income contingent repayment approach is that it avoids the basic problem of the usual type of loan offered by banks, known as a 'mortgage style' loan. This type of loan arrangement requires repayments to be made over

a specified period of time, for example, the term of a mortgage. Usually no weight is given to the consequences of low income because debt obligations have to be met within a given period of time.

The essential difference between income contingent and mortgage types of loans is that the income contingent variety serves to protect prospective students from the costs of the exigencies associated with the returns to educational investments. What HECS, for example, offers is a form of 'default insurance', such that former students do not have to bear the costs of reneging on their debt as a result of periods of low future income. This is quite different to a mortgage-style loan, in which the costs of defaulting exist and may be very high in terms of being locked out of other capital markets (most notably for housing) through damage to a person's credit reputation.

Default protection from income contingent repayment overcomes the fundamental problem for prospective borrowers inherent in other loan schemes. With income contingent approaches there is unlikely to be any concern about prospective students being unable to repay a loan or making repayment under financial duress.

It is important to emphasise that some aversion to borrowing for human capital investment is perfectly understandable. After all, the returns to such investments have a very high variance — many students enrolled in VET do not complete their courses, and the income differences between VET graduates can be significant. The critical point is that when the repayment arrangements are sensitive to the personal income of the VET graduate, the default issue related to borrowing essentially disappears.

3.3 Income contingent repayment and consumption smoothing

A related problem for students with bank loans concerns possible consumption difficulties associated with fixed repayments. If the expected path of future incomes is variable, a fixed level of a debt payment increases the variance of disposable (after debt repayment) incomes. The point can be illustrated with the following simple example, with much more detail being available in Chapman (2006).

Imagine that a student incurs a debt with a constant monthly level of repayments of $500 after graduation, say, for 5 years. If her monthly income is expected to be a constant amount of $5,000 after-tax, then the debt is also a constant proportion of income, in this case 10 per cent. It is more likely to be the case that she expects her income to increase over time, as a result of promotions for example, implying that the bank repayment would be expected to fall as a proportion of disposable income. In these cases the bank loan should not be expected to significantly affect her welfare.

But in the event of misfortune, such as job loss, or sickness, the former student's income stream might be far less stable than for the above circumstances. For example, imagine that the student gives a positive probability to a monthly after-tax income stream of $5,000 for the first year, but only $1,500 for the second year. In this case, her *ex post* loan obligations turn out to be 10 per cent of income initially, but then reach 33.3 per cent of income. The fixed loan repayment obligation is then associated with the likelihood of significant consumption hardships. Moreover, the possibility has a greater potential to discourage loan take-up from those expecting to not have access to alternative finances to help in

the event of low future incomes, and these are more likely to be members of relatively disadvantaged groups.

In summary, income contingent loans offer the prospect of a solution to the financial market problems inherent in charging for VET. In contrast, the up-front fee regimes currently in place in the public VET sector can be argued to be a less favourable arrangement, for both economic and social reasons.

4. AUSTRALIA'S EXPERIENCE WITH HECS[1]

In 1989 the Australian Federal Government re-introduced charges for undergraduate university students, with a (then) unique financing instrument, an income contingent loan. The system was known as the Higher Education Contribution Scheme and it allowed students to postpone the payment of the charge until their future incomes exceeded a given threshold, at that time equal to the average income of all Australians working for pay. The charge was a flat rate of $1,800 per full time unit of study per year (in 1989 dollars). Those choosing to pay up-front were given a discount of 15 per cent, but after the debt is incurred the rate of interest was (and remains) equal only to the rate of price inflation.[2]

At the time of the introduction of HECS close to nothing was known about the effects of income contingent loans, because the scheme was the first of its kind. There are several areas of interest in an assessment of the empirical consequences of HECS. They concern the effects of HECS on the private benefits

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1   Some of the analysis of this section follows discussion in Chapman (2006).
2   The discount for up-front payment was increased to 20 per cent, but has since been reduced to 10 per cent.

to higher education and the consequent demand for admission, and the access of the poor to the university system.

4.1 Studies of aggregate demand for university places

Two approaches have been adopted to assess the impact of HECS on student demand. One has been to estimate its impact on the private returns to investment in higher education. The second has been to explore whether higher education participation changed after either the introduction of HECS or the 1997 variations to its operation.

Chapman and Ryan (2005) adopt the first approach. They analysed whether the introduction of student charges through HECS in 1989, and the major changes to the system in 1997,[3] had significant impacts on the net economic benefits to graduates from a university education. The approach involves examination of private internal rates of return to higher education, a calculation requiring the construction of income profiles for hypothetical individuals, based on data from representative individuals.

The internal rates of return estimates before and after the introduction of HECS, and following the 1997 changes are shown in Table 2 (taken from Chapman and Ryan 2002).

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3   In 1997 differential charges by course were introduced, the first income threshold of repayment was decreased considerably and the average charge was increased substantially. See Chapman and Salvage (1997).

Table 2: Real internal rates of return to higher education for males and females: various HECS scenarios (per cent per annum, after tax)

	Men	Women
1988 (NO HECS)	14.6	13.9
1989–90	14.1	13.8
1997–98	13.1	12.6

Source: Chapman and Ryan 2002

There are several points of significance from the table. First, before HECS (in 1988), real rates of return to both men and women, of 14.6 and 13.9 per cent per annum, were very high. Second, both the introduction of HECS, and the substantial changes in both the level of the HECS charge and the parameters of the repayment rules introduced in 1997, were not associated with major changes to internal rates of return. Chapman and Ryan (2005) conclude that Australian university graduates on average have done very well in the labour market, and HECS has had little impact on these private benefits.

Borland (2001) also estimated rates of return based on income profiles, but from a different ABS data source. In Borland's results there was a 1.5 percentage point difference in the returns for a representative male who repaid his post-1996 HECS Band 2 course debt after entering the labour market, compared to a no-HECS regime. This is the same as in Chapman and Ryan (2002) and reported in Table 2 between the pre-HECS 1988 rate of return and the post-1996 return.

If HECS has not affected the return on the investment in a substantial way, it would seem reasonable to expect little change in the aggregate demand for higher education. This is not as straightforward as it seems since the issue requires some background commentary on the different potential meaning of the notion of 'aggregate demand'.

An important point involves the distinction between applications and enrolments. That is, a potential senior high school student's interest in pursuing higher education begins with her making an application for a place. If a place is offered her next decision concerns whether or not to accept and to thus enrol. The distinction between applications and enrolments is not very interesting if there is an excess supply of places, but this has not been the case in Australia over the last several decades. Indeed, HECS was motivated in part by the perceived need to diminish the number of 'qualified' students unable to access higher education due to the shortage of places.

There have been several empirical exercises exploring the effects of HECS on applications. The first, from Andrews (1997), used a multiple regression approach attempting to explain changes in the ratio of applicants from Year 12 to the total number of Year 12 students. He included measures of youth job opportunities, and allowed the effects of the announcement, introduction and changes to HECS to be estimated separately. He found the introduction of HECS had arguably lowered applications from school leavers (but not mature-aged applicants). However, he estimated that the 1996 changes had no impact on applications from school leavers, but may have had a negative impact on mature age applications.

More recent analysis of similar data in Aungles, Buchanan, Karmel and MacLachlan (2002) used application numbers, rather than ratios, and in contrast found no effect on school leaver applications following the introduction of HECS. After 1996, however, there was a small yet significant decrease (of less than 10 per cent). The decrease in applications from mature-age people after 1996 was somewhat higher.

Some uncertainty remains about these results, for the following reasons. The first is that the analysis did not have a lot of available data. Second, in all exercises of these types potentially other factors are at work but their influence has not been taken into account. These could include student income support arrangements (Birrell et al 2000), changes in the expected benefits of higher education, or the indirect influence of the expansion or otherwise of the number of places.

Overall, the analyses of aggregate demand effects do not provide a simple and unambiguous story. But it seems reasonable to conclude from the available evidence that, if HECS has reduced demand for university places among school leavers, the effect has been small. Its effect may have been more substantial with respect to mature-age applicants, for whom the return to university study might be expected to be smaller in general (since they have less time to earn higher incomes before retirement). Further, mature-aged potential students are more likely to be earning over the income repayment threshold already, meaning that changes to HECS have a more immediate potential effect. Changes in mature-aged demand cannot be properly analysed without taking into account this effect.

4.2   Studies of participation by disadvantaged groups

The second approach used to assess the impact of HECS on enrolments involves testing whether participation behaviour among low socioeconomic status groups changed in a way that was different from other groups, after either the introduction of HECS or after the changes to the scheme introduced from 1997. Therefore, the focus of these studies is not on the relationship between

socioeconomic status and university participation at any point in time, but rather on whether the relationship changed.

One example is Andrews (1999), who traced the share of low socioeconomic status students among 17 to 24 year olds who commenced higher education from 1989 to 1998, including their share of disciplines included in the high cost Band 3 introduced in 1997. Individuals were assigned the socioeconomic status score of the region where they or their family lived, based on the postcode of their home address. Individuals from low socioeconomic status backgrounds were defined as those whose home postal address was in the lowest quartile of the population, as determined by the value of the relevant socioeconomic status index. Andrews found that neither the introduction of higher and differential HECS nor the lowering of the income repayment threshold after 1997 affected the share of low socioeconomic status individuals among total higher education students.

Aungles et al (2002) also used the local area socioeconomic averages concerning education and occupation, as did Andrews (1999), to explore the possibility of there being an effect on commencements of the relative disadvantaged from the 1997 HECS changes. In general, they found that the share of university commencements of students from low socioeconomic backgrounds did not change. However, there was apparently an effect of differential HECS on subject choice, with a decrease in enrolments of low socioeconomic status males in courses in which the HECS charge increased most. The actual numbers involved were very small (less than 200 individuals) and these individuals were not discouraged from attending university *per se*, they simply changed their course choice. Chapman and Ryan (2005) report a similar effect in direction for this

group using a measure of family wealth, but it was not found to be statistically significant.

A major uncertainty about the analysis of Andrews and Aungles et al (2002) relates to the attribution to individuals of the average socioeconomic status level of the postcode of their home address. Western, McMillan, and Durrington (1998) present results based on a survey of 3000 university students in Queensland that suggest such an approach is not reliable, finding that the correlations between individually based socioeconomic status measures and the same postcode based index used by Andrews are quite low. This might be consistent with there being an independent role for geographic area.

The main implication of the Western et al (1998) results is that it would generally be better to attempt to assess the impact of the introduction of HECS on the social composition of the university student body by using individually based measures of socioeconomic status. Other studies have used individually based socioeconomic status measures in analysis of Australian higher education participation. Long, Carpenter, and Hayden (1999) and Marks, Fleming, Long and McMillan (2000) used four and five panels of longitudinal data respectively to identify how education participation changed in Australia from the 1980s to the late 1990s. Long et al used parental education and occupation to identify differences in education participation by socioeconomic status, as well as an indirect wealth index constructed from responses by individuals to questions about the presence of material possessions in their houses.

Long et al (1999) analysed participation in higher education by age 19, for two reasons. The first is that in Australia many school leavers defer university entrance for a year. The second is that their data are drawn from cohorts of

individuals of the same age. Since the structure of schooling varies across Australian states, many individuals would not have had the opportunity to attend university until the year they were aged 19 in the data used. Long et al analysed data for individuals aged 19 in 1980, 1984, 1989 and 1994, interpreting loosely their third and fourth cohorts as pre- and post-HECS introduction cohorts.

Long et al found that wealth has a strong positive effect on higher education participation. In addition, they found that differences between socioeconomic status groups widened somewhat in the fourth cohort compared to the third. However, they acknowledged that such a trend was evident in the earlier cohorts, so that it may not have been a specific HECS-related effect.

Chapman (1997a) analysed university participation among 18 year olds in the last two cohorts analysed by Long et al (1999) and concluded that the introduction of HECS had not affected university participation by students from disadvantaged backgrounds. Chapman's approach had the advantage of measuring university participation in 1988 for the third cohort, prior to the introduction of HECS. However, not everyone aged eighteen in these data had completed school when surveyed in the relevant years, so the estimates understated university participation among young Australians.

The measure of participation used by Marks et al (2000) for the additional cohort they analysed differed from that used for the earlier cohorts by Long et al (1999). It was the proportion of individuals in higher education in 1999 that had been in Year 9 in 1995. The wealth measure used by Marks et al (2000) for the last panel also differed from the earlier ones. This research confirmed the positive impact of wealth on higher education participation. However, in general, their results

suggested that socioeconomic status was less important in determining higher education participation in the 1999 data than had been the case in the earlier panels.

Marks and McMillan (2006) analyse university participation within ranges of the entrance scores used by universities to select students for undergraduate courses in 1999. They find that within these entrance score ranges, individuals whose parental occupational backgrounds are 'blue' collar are as likely to participate in university as those whose parental occupational backgrounds was professional. They conclude that since occupational origins have little influence on university participation once entrance scores are taken into account, HECS has not deterred students from less privileged backgrounds from attending university.

Cardak and Ryan (2006) produced similar results. They found that students from the most disadvantaged social backgrounds entered university at similar rates to those from the most advantaged backgrounds who had the same university entrance scores as them. Their university participation rates were much lower than those from the most advantaged backgrounds because they were less likely to obtain an enter score and obtained a much lower one on average where they did. Among students with the same levels of school achievement in year 9, those from more advantaged backgrounds were able to convert that achievement into substantially higher university entrance scores by the end of their schooling than otherwise similar students from poorer backgrounds.

Chapman and Ryan (2005) analyse the access effects of HECS using three of the longitudinal panels of data used in the Long et al (1999) and Marks et al (2000) studies. They use a consistent definition of university participation across these

three cohorts. Chapman and Ryan (2005) analyse the participation in higher education of 18 year olds in the first year they could potentially attend university. Thus for the first two cohorts they estimated the participation in higher education in 1988 and 1993 of individuals who should have reached Year 12 in 1987 and 1992 respectively. For the 1999 cohort analysed in Marks et al (2000), Chapman and Ryan analysed higher education participation among 18 year olds.

Chapman and Ryan concluded that the introduction of HECS did not affect the access of the disadvantaged, in terms of enrolments. They found that the socioeconomic composition of the higher education student body changed somewhat between 1988 and 1993 in Australia, with the main change being the relative increase in participation by individuals in the middle of the wealth distribution.

In the period after significant modifications to HECS all socioeconomic groups experienced the same proportionate increases in participation. Further, while there was an across-the-board decrease in the intentions of secondary students concerning university participation in 1996 after the announcement of the changes, in the next year (for all socioeconomic groups) enrolment intentions rebounded to their previous levels. Finally, for those who had not intended to participate in university, no differences associated with socioeconomic background were found in the proportion that eventually did participate.

More generally, Chapman and Ryan (2005) concluded that changes in overall university participation appeared to reflect different behaviour across genders rather than across socioeconomic groups, with the exception that growth was highest among the middle of the wealth distribution.

The conclusions from the Australian research with respect to socioeconomic mix and access are as follows.

(i)   The relatively disadvantaged in Australia were less likely to attend university even when there were no student fees. This provides further support for the view that a no-charge public university system (that is, financed by all taxpayers) is regressive;

(ii)   The introduction of HECS was associated with aggregate increases in higher education enrolments;

(iii)   HECS did not result in decreases in the participation of prospective students from relatively poor families, although the percentage point increases were higher for less disadvantaged students, especially in the middle of the wealth distribution;

(iv)   There was a small decrease in the aggregate number of applications after the 1997 changes, but no apparent decreases in commencements of members of low socioeconomic groups, except perhaps for a small number of males into courses with the highest charges; and

(v)   The significant changes to HECS introduced in 1997 were associated generally with increases in the participation of individuals to 1999, irrespective of their family wealth. Even so, the growth in participation has slowed since then.

5. DOES VET PAY?

In this section we employ the concept of the ***internal rate of return*** (IRR) in order to measure the rewards from VET-level qualifications and establish a metric by which to assess the impact of an income contingent loan on VET, which is examined in the following section. The choice of a financial measure was guided by both theoretical and practical considerations. While many factors may impact upon an individual's education decision, post-graduate remuneration and probability of employment are likely to figure prominently for most. And while education confers a range of other individual benefits, these benefits are generally more difficult to quantify. The methodology used to estimate rates of return to education is well developed and widely used, and involves the comparison of the stream of incremental future income associated with education with its costs. The IRR is the discount rate that equates these aggregates.

This section proceeds as follows. After first introducing the dataset, we derive earnings profiles from standard wage regressions. Together with a few simplifying assumptions about costs, we are then able to estimate IRRs for various VET-level qualifications. As an extension, we repeat this process using quantile regression techniques to provide a distributional dimension to the analysis.

5.1 Data

The dataset for this study is a pooled cross-section from the first three waves of the Household Income and Labour Dynamics in Australia (HILDA) survey.[4] HILDA is a longitudinal survey of Australian households funded by the Commonwealth Government and administered by the Melbourne Institute of Applied Economic and Social Research. It contains a wealth of information across a range of economic, financial and social variables, and, as such, is ideally suited to asking questions about the returns to education.

The analysis is restricted to individuals aged between 15 and 64, so as to capture individuals during their primary working years. In addition, to preserve the generality of our results, we exclude individuals whose education-earnings dynamics are thought to be significantly different from the population at large. These include individuals not in full-time employment (that is, part-time workers, the unemployed and those not in the labour force), self-employed workers, those not born in Australia, and indigenous Australians.

Summary statistics for variables used in our analysis are listed separately for men and women in Table 3. There are 6187 male and 3766 female observations in the estimation sample. In 2004 dollars men earn an average $1052 per week and work around 45 hours while women earn an average of $850 working almost 42 hours per week.

Education is divided into nine binary (1,0) dummy variables representing the highest qualification attained. The variable capturing those that did not

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4   The analysis for the paper was substantially undertaken in the second half of 2005, when only three waves were available, for 2001, 2002 and 2003. Fourth and fifth waves, covering 2004 and 2005, were released in January 2006 and January 2007.

complete high school is omitted in the estimations, and becomes the base for comparisons. The distribution of educational qualifications is broadly as expected with 31 per cent of men reporting no post-school qualifications, 47 per cent reporting vocational qualifications and the remainder (22 per cent) reporting a university degree or higher. For women, the numbers are 32, 35 and 33 per cent. Finally, a measure of time in paid work derived in the HILDA survey is used to proxy experience. On average, men have around 19.5 years of work experience while women have around 16.5 years.

Table 3: Variable definitions and summary statistics

Variable	Definition	Male		Female	
		mean	std dev	mean	std dev
Dependent variable					
Wage	Log of gross weekly wage from main job, in	6.83	0.51	6.65	0.44
	Gross weekly wage in 2004 dollars	$1,052	$568	$850	$397
Educational variables					
Higher degree	Dummy, = 1 if highest qual is a higher degree	0.03	0.18	0.04	0.19
Postgraduate diploma	Dummy, = 1 if highest qual is a post-graduate	0.05	0.21	0.09	0.28
Degree	Dummy, = 1 if highest qual is a degree	0.14	0.34	0.21	0.41
Diploma	Dummy, = 1 if highest qual is a diploma or an	0.09	0.28	0.11	0.32
Certificate III/IV	Dummy, = 1 if highest qual is a Certificate III	0.31	0.46	0.13	0.33
Certificate I/II	Dummy, = 1 if highest qual is a Certificate I or	0.05	0.22	0.07	0.25
Certificate (level unknown)	Dummy, = 1 if highest qual is a Certificate of	0.03	0.17	0.04	0.21
Completed school	Dummy, = 1 if highest qual is Year 12	0.11	0.31	0.13	0.33
Incompleted school	Dummy, = 1 if did not complete school	0.20	0.40	0.19	0.39
Other variables					
Experience	Time in paid work in years	19.50	11.47	16.70	10.48
Hours	Hours of work per week in main job	45.48	9.42	41.77	7.75

5.2 Earnings functions

The first stage of our approach involves the use of wage equations to describe the impact of educational qualifications on earnings. We estimate a standard wage equation of the following form:

$$\ln w_{it} = X_{it}' b + e_{it}$$

where $i = 1,..., N$ represents the number of individuals at each wave and $t = 1,...,3$ is the number of waves. X_{it} is a vector of characteristics that influence wages,

including education, estimated experience and hours worked. Following Ryan (2002), we also allow experience effects to differ by level of (post-school) education by interacting university and VET-level qualifications with experience. Higher order terms are included for experience, hours and education-experience interaction terms to allow these effects to be non-linear.[5]

The parsimony of the specification is a feature of our approach, and is intended to capture the full educational qualification effect that would otherwise be diluted by a range of control variables. For example, wage equations typically include controls for occupation and other job characteristics, thereby removing from the educational qualification effect an important private benefit of education — that is, enhanced access to a range of occupations. By excluding such controls from the specification, the educational qualification effects will include that component that reflects the improved occupational distribution available to graduates compared with non-graduates.

The intellectual pedigree of this framework is well established, with roots in Mincer's (1974) human capital earnings function, where individual earnings are a function of education. However, there remains considerable debate in the literature about the precision of estimates from a standard ordinary least squares (OLS) regression. First, if unobserved factors such as motivation or inherent ability affect both earnings and the amount of education an individual acquires, then OLS estimates of the return to education will be biased. A significant literature has evolved over the years in an attempt to control for this 'ability bias' and this is now considered briefly.

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5   Note that higher order terms are scaled so that a reasonable number of informative digits can be seen within the fields of the table.

Ashenfelter, Harmon and Oosterbeek (1999) classify the literature into three broad strands: one approach attempts to control for ability bias by including measures that proxy for unobserved ability, such as IQ tests (Griliches and Mason 1972; Griliches 1977); a second studies the education and earnings outcomes of twins on the presumption that twins have equal inherent ability (Ashenfelter and Krueger 1994; Miller, Mulvey and Martin 1995); and a third approach employs the instrumental variables technique which requires instruments that are correlated with education but not with the earnings residual (Angrist and Krueger 1991). Card (1999), in his survey of the literature concludes 'that the average return to education is not much below the estimate that emerges from a standard human capital earnings function fit by OLS.' This may be because measurement error tends to cancel out the ability bias, suggesting that the OLS estimate will be close to the true estimate Griliches (1977).

A second reason why post-course wage differentials might be a poor guide to the 'pure' qualification effect on wages is that that wage-experience profiles estimated from data collected at one point in time, like that used in this analysis, may not provide an accurate representation of the experience of cohorts as they age. However, Chia (1991) found that while estimates of the return to a university degree based on cross-sectional Australian data to the mid-1980s indicated that the return had fallen over time, cohorts of recent graduates enjoyed similar wage advantages over their less educated peers as had their predecessors. The analysis of the experience of graduate cohorts therefore pointed to no deterioration in their position relative to their peers. More recently, Borland and Kennedy (1998) found that age-earnings profiles were stable in Australia over the 1980s and 1990s.

As such, we proceed on the basis that wage-experience profiles will provide robust rate of return estimates with any biases as a result of unobserved ability or the use of cross-sectional data likely to be small. The results of wage regressions for both men and women are reported in full in Table A1 in the Appendix, with more readily interpreted transformations of selected coefficients presented below in Table 4.

As expected, wages are increasing in education. For example, a male who has completed school earns around 27 per cent more than one that has not completed school, a male whose highest qualification is a diploma earns 47 per cent more, and a bachelors degree holder over 80 per cent more. Similarly for women, a school graduate earns 17 per cent more than an individual that does not complete school, while diploma and degree graduates earn 50 and 122 per cent more, respectively. Interestingly, women with post-school qualifications earn a higher wage premium (relative to women that did not complete school) than their male counterparts. For example, women with a post-graduate degree could expect to earn 150 per cent more than those without a high school certificate, while the corresponding premium for men is 106 per cent. This likely reflects diminished earnings prospects for women who do not complete school relative to their male counterparts.

Consistent with theory, the results also point to diminishing returns to experience. For example, a male VET graduate can expect a double-digit increase in wages for his first year of work experience, a 7 per cent increase for his fifth, and less than a ½ of one per cent increase as he gains his twentieth year of experience. Diminishing returns to experience are evident for both sexes irrespective of educational level, although the initial returns to experience are

somewhat lower for female VET and school graduates than their male counterparts.

Table 4: Interpretive statistics from first stage wage regressions

	Male	Female
Educational attainment		
(% difference in wages relative to individuals that did not complete school)		
Higher degree	106	150
Postgraduate diploma	93	138
Degree	83	122
Diploma	47	50
Certificate III/IV	27	29
Certificate I/II	7	32
Certificate (level unknown)	16	38
Completed school	27	17
Experience		
(% change in wages for a marginal increase in experience at selected levels of experience)		
University		
1 year	10.9	12.8
3 years	8.5	9.6
5 years	6.4	7.0
10 years	2.9	2.6
20 years	0.4	-0.1
VET		
1 year	11.8	3.4
3 years	9.1	3.0
5 years	6.9	2.6
10 years	3.0	1.7
20 years	0.2	0.4
Other		
1 year	14.1	8.8
3 years	10.7	6.8
5 years	7.9	5.1
10 years	3.1	2.2
20 years	0.1	0.0

From these results we are able to construct age-earnings profiles that can be used to derive the incremental income from attaining a particular level of education, and these are now shown in Figure 1. The profiles assume a full working life of 47 years, from age 18 to 65. For those undertaking post-school study, this is reduced by the amount of time it takes to complete that study. In this exercise we assume that a basic vocational certificate (I or II) takes 6 months to complete, a skilled vocational certificate (III or IV) one year, associate diplomas one and a half years, and a diploma, two years.

Figure 1: Selected age-earnings profiles

Annual earnings 2004
Panel A: Men
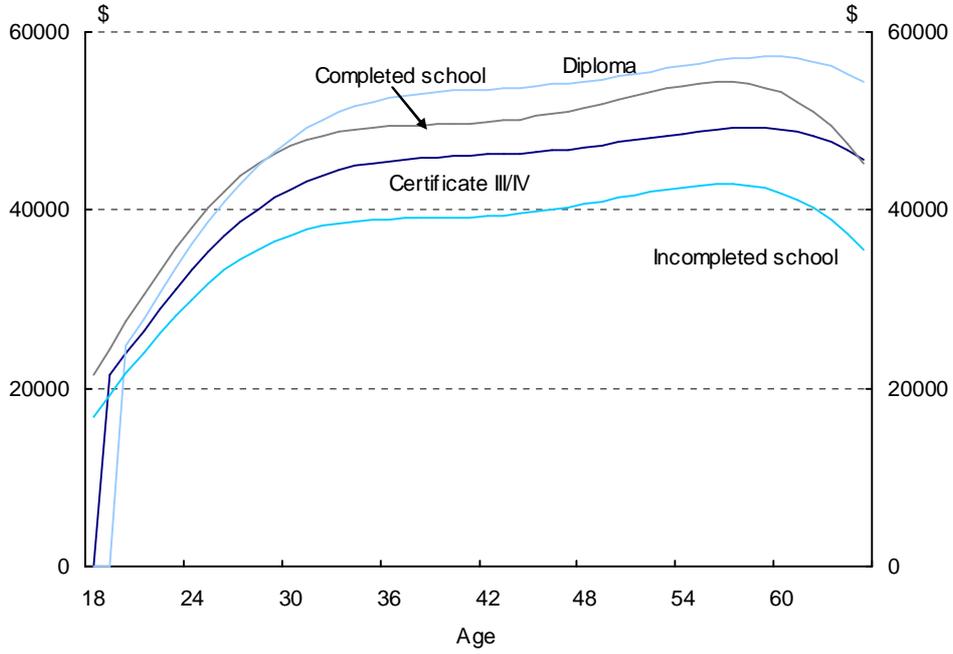
Panel B: Women
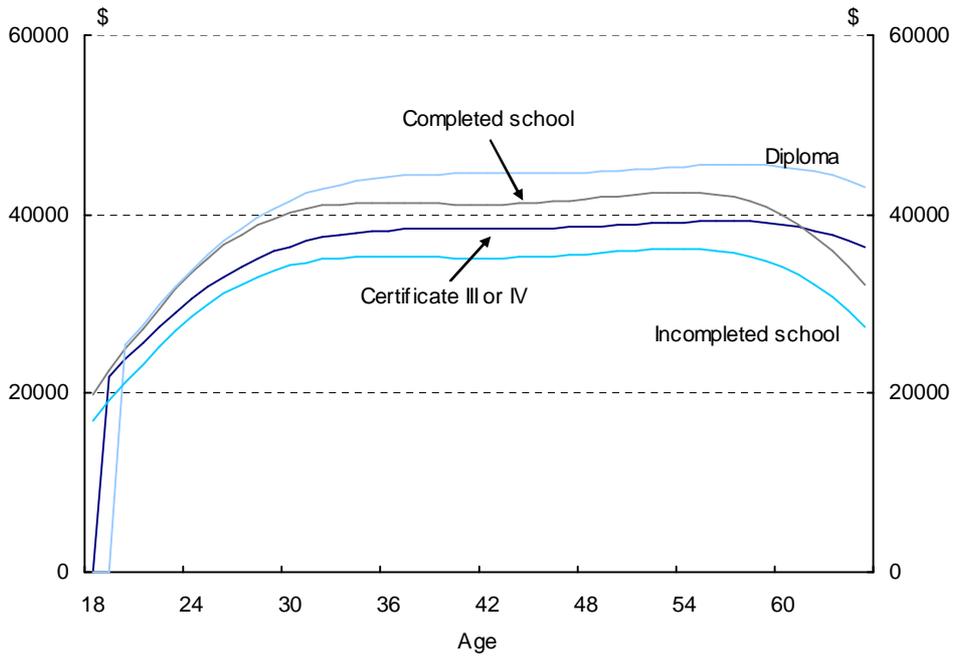
The earnings profiles trace out the expected pattern of a steep increase in real earnings in the first part of an individual's working life, increasing more gently in the middle part, before plateauing towards the end.[6] The dip in the profiles from ages 60 to 65, which is particularly pronounced for those without post-school qualifications, is confirmed in the raw data (see Appendix Figure A1). More broadly, the profiles given by the raw data are relatively close to that generated from our wage regressions, confirming somewhat the appropriateness of our specification. As expected, the profiles for men are higher at all levels of educational attainment, particularly for post school qualifications.

5.3 Internal rates of return

As mentioned earlier, the standard analytical tool used to estimate private rates of return to education is the IRR, the discount rate that equates the benefits from a given level of education with the costs of obtaining the qualification.[7] In this framework the benefit from study is the post-course wage differential between graduates and a selected comparison group, while the costs are forgone earnings during the period of study and the course fees.[8]

It is clear at this point that identifying an appropriate comparison group for a each level of VET qualification is critical to calculations of both post-course wage

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6   Note that these profiles are shown in cross-section here. Income profiles used in calculations of IRRs and repayment paths under an income contingent loan are adjusted for growth in Average Weekly Earnings (which is assumed to be 4 per cent per annum). The implications of this are discussed in section 6.1.

7   It is worth noting that the IRR provides an estimate of the return to education *given the amount invested*. That the IRR from some qualification exceeds that of another does not imply that it produces a higher lifetime income stream — the costs of obtaining it may be lower.

8   Since both the stream of benefits and costs are discounted, greatest weight in the calculation of the IRR is given to immediate costs and benefits of the education and training.

differentials and forgone income. The objective is to find the group that would most closely reflect the earnings capacity of an individual if they did not undertake the course of study in question. In what follows comparisons are made between diploma graduates and individuals who have completed school (but without any post-school qualifications) while individuals with a Certificate III or IV qualification are compared with those who did not complete their schooling. These judgments are made on the basis that completion of Year 12 or Year 10 in conjunction with a related certificate course are common pre-requisites for entry into diploma courses. In contrast, completion of high school is often not a prerequisite for skilled vocational qualifications (even though many young people now enter skilled vocational qualifications having completed their schooling).

In addition to identifying an appropriate comparison group, the calculation of forgone income also relies heavily upon related assumptions about the mode of study and level of income support. Using data from the 1997 TAFE graduate destination survey, Ryan (2002) found that skilled vocational graduates were more likely than other graduates to be working during their courses, and about a third of them were employed before, during, and after their courses by the same employer. He concludes that, for many graduates, forgone income from undertaking their course is likely to have been minimal.

Notwithstanding the above, for simplicity we assume that all post-school qualifications are undertaken on a full-time basis so that students do not draw an income from employment during the period of study. All other things being equal, this will result in an overestimate of forgone income, and therefore, an underestimate of the IRR for some students. However, we expect this effect will be ameliorated by the inclusion of income support in the calculation. The income

support rate is assumed to be $8500 per annum (applied on a pro-rata basis for part year study), based on the '18 and over, away from home' rate of Youth Allowance.

Finally we must also make some assumptions about the direct costs of courses. VET course costs vary substantially between course types, level, jurisdictions, provider types and institutions. In addition, concessional rates typically apply to individuals in receipt of social security payments such as the Youth Allowance. On the basis of an internet search of the fees charged by institutions and estimates in Borthwick (1999), fees for full-time, full-year students who pay full course costs appear to lie between $500 and $1500 per annum in 2005.[9] For completeness, we provide IRR estimates assuming course costs of $500, $1000 and $1500 per annum.

Estimates of the IRR for selected VET qualifications are presented in Table 5, and in general they appear to be high. A one-year Certificate III or IV qualification returns significantly in excess of more advanced VET qualifications because the investment (forgone income) is less: the course is shorter in duration and the chosen comparison group (individuals who did not complete school) have a significantly lower earnings profile than the corresponding reference group for diploma students (individuals who did complete school). In other words, the bar is set at a lower point on the education hierarchy. Even so, our results suggest the financial return is still very healthy for more advanced VET courses, with associate diplomas/diplomas yielding IRRs of between 7 and 10 per cent for men, and between 10 and 14 per cent for women.

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9   This is consistent with the levels reported in Watson (2003).

Table 5: IRRs for selected VET qualifications

	Male	Female
Diploma (2 years)		
Course cost = $500 per annum	7.7%	10.5%
Course cost = $1000 per annum	7.6%	10.3%
Course cost = $1500 per annum	7.5%	10.1%
Assoc diploma (1.5 years)		
Course cost = $500 per annum	10.1%	14.3%
Course cost = $1000 per annum	10.0%	14.0%
Course cost = $1500 per annum	9.8%	13.6%
Certificate III/IV (1 year)		
Course cost = $500 per annum	37.3%	31.8%
Course cost = $1000 per annum	35.9%	30.3%
Course cost = $1500 per annum	34.7%	28.9%

Note: The comparison group for diploma qualifications is 'completed school' while comparison group for Certificate III/IV is 'did not complete school'.

5.4 Quantile regression analysis

To this point, our results have been derived at the mean of the conditional wages distribution, which begs the question whether they are representative across the entire distribution. This seems particularly relevant for the question at hand, given access to education is more likely to be prohibitive for low income individuals, placing increased importance on understanding the dynamics of the educational investment decision at the tails of the distribution. Quantile regression, as introduced by Koenker and Bassett (1978) provides a means of investigating distributional issues. In simple terms, quantile regression provides for estimation at all points of the conditional wage distribution, not just at the mean as required by OLS.[10]

Using quantile regression techniques, we re-estimate the wages equation presented in section 5.2 at the 25th, 50th and 75th percentiles of the conditional wages distribution, with full regression results, interpretive statistics and

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10   See Koenker and Hallock (2001) for an accessible description of quantile regression, or Buchinsky (1998) for a more comprehensive review.

age-earnings profiles presented in Appendix tables A2 and A3 and illustrated in Figure A2. For VET level educational variables there is a clear tendency for the estimated coefficient, and therefore the wage benefits, to increase along the conditional wages distribution.[11] For example, the coefficient on the diploma qualification for males increases from 0.34 at the 25th percentile to 0.48 at the 75th percentile, implying a wage premium of 41 per cent and 62 per cent respectively over otherwise similar males that did not complete school.[12] The pattern is similar for women, with the coefficient on VET diplomas increasing from 0.35 to 0.46 between the 25th and 75th percentiles, implying a premium of 42 per cent and 59 per cent respectively over their counterparts that did not complete school.[13]

Figure 2: Quantile regression estimates for selected VET qualifications

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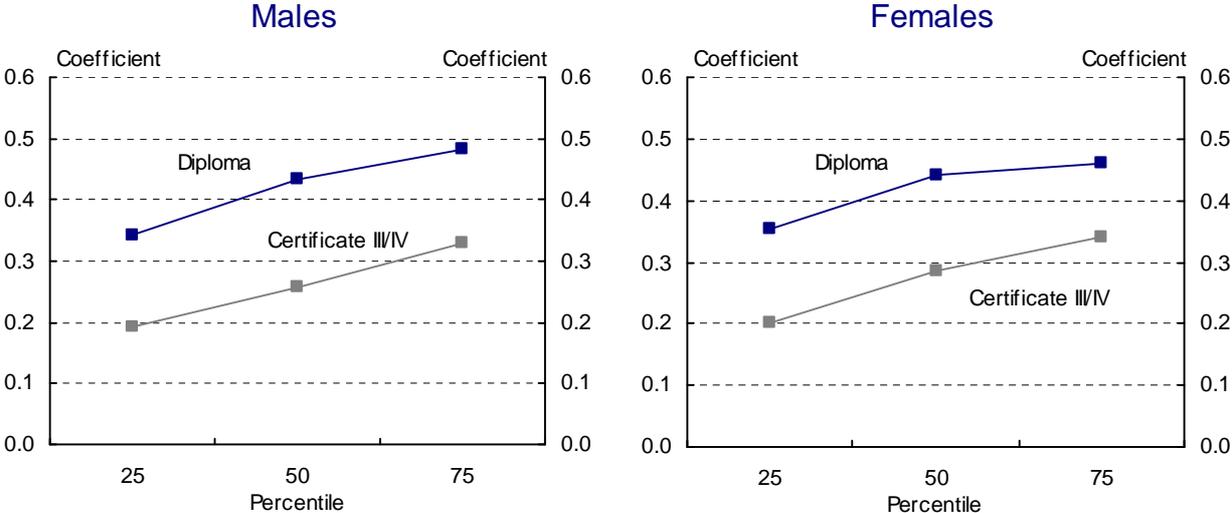
11 Intuitively, this means that the dispersion of income for VET graduates is greater than for those that did not complete school.

12 The wage premium figures differ from the coefficents because of the log transformation.

13 Interestingly, this pattern is reversed for university level qualifications, with the estimated wage benefits higher at the 25th percentile than at the75th percentile for both male and female university graduates.

Under the same assumptions as before, we generate IRR's for selected VET qualifications at the 25th, 50th and 75th percentiles. As before, returns are higher for Certificate III/IV qualifications than for diploma level qualifications, and seem relatively invariant to assumptions about course fees. However, there is some variation in IRRs across the wages distribution. On average, the results for diploma qualifications indicate that returns are higher around the middle to lower part of the wages distribution. For example the estimated IRR for a male undertaking a 2 year diploma peaks at above 10 per cent at the 50th percentile, and compares with an estimated IRR of around 7 per cent at the 75th percentile (and around 7½ per cent from earlier mean regressions).

For women the contrast is even starker, with the IRR for a 2 year diploma trebling from around 5½ per cent at the 75th percentile to between 14 and 15 per cent.[14] Note that the pattern of IRRs across the income distribution for diploma qualifications may not necessarily match that implied by the estimated wage returns because the counterfactual reference group is different. In the case of the estimated parameters presented in Figure 2, wage returns increase along the income distribution *relative to individuals that did not complete school*, while in the IRR calculations presented in table 6, the comparison group for diploma graduates is *individuals that completed high school*. That the IRR's for diploma graduates peak at the middle to lower end of the income distribution merely suggests that individuals that completed high school (and nothing higher) have a greater variance in incomes along the distribution that diploma graduates.

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14   Recall that earlier results from the mean of the conditional wages distribution resulted in corresponding IRRs of between 10 and 10.5 per cent.

This pattern is reversed for lower level VET qualifications, with IRRs for Certificate III/IV qualifications higher at the 75th percentile than at the 25th percentile for both men and women. Notwithstanding this, rates of return at the lower end of the distribution are still very healthy, at between 35 and 40 per cent for men and just under 20 per cent for women.

Table 6: IRRs for selected VET-level qualifications under for different quantiles

	Male			Female		
	Q25	Q50	Q75	Q25	Q50	Q75
Diploma (2 years)						
Course cost = $500 per annum	8.2%	10.9%	7.1%	14.7%	12.4%	5.6%
Course cost = $1000 per annum	8.0%	10.8%	7.0%	14.4%	12.2%	5.5%
Course cost = $1500 per annum	7.9%	10.6%	7.0%	14.1%	12.0%	5.5%
Assoc diploma (1.5 years)						
Course cost = $500 per annum	11.2%	14.8%	9.5%	20.1%	17.0%	7.4%
Course cost = $1000 per annum	10.9%	14.5%	9.4%	19.3%	16.5%	7.2%
Course cost = $1500 per annum	10.7%	14.2%	9.3%	18.7%	16.1%	7.1%
Certificate III/IV (1 year)						
Course cost = $500 per annum	40.6%	43.6%	43.0%	19.9%	34.5%	48.3%
Course cost = $1000 per annum	38.4%	41.8%	41.6%	19.1%	32.6%	46.4%
Course cost = $1500 per annum	36.5%	40.2%	40.3%	18.4%	30.9%	44.6%

Note: comparison group for diploma is 'completed school' while comparison group for Certificate III/IV is 'did not complete school'

6. INTRODUCING AN INCOME CONTINGENT LOAN TO THE VET SECTOR

In this section we assess the implications of introducing an income contingent loan to the VET sector. Critically, we assume the income contingent loan will follow the template given by HECS: that is, the loan will be levied on an interest free basis and have the same repayment parameters as for HECS loans. Having already established an expected earnings stream for VET graduates in the previous section, it is a straightforward task to derive a loan repayment path under a HECS-style regime, and raises issues of the extent of a Commonwealth Government subsidy to VET students.

6.1 How long will it take to repay?

Using the earnings profiles for VET graduates derived in the previous section, and applying the current HECS repayment parameters, we are able to derive an expected repayment path for VET loans under a HECS-style regime. In deriving these repayment streams we depart from the standard approach of assuming that the earnings stream on which repayments are based is given simply by the cross-sectional earnings profiles, without any adjustment for growth in average earnings as a result of inflation or general productivity growth in the economy. Rather, since the actual repayment is determined by the nominal earnings of the individual, we adjust the earnings profile derived in section 5.2 by growth in Average Weekly Earnings.[15]

Repayment scenarios for individuals undertaking a 2-year diploma course are shown separately for men and women in Figure 3. Male graduates of such a course can expect to start repaying their loan five years after graduation, and depending on the course cost, will repay the loan in full in either one or two years. Female graduates will start repaying their debt on average in their seventh year after graduation. Again, given the relatively low course fees, they can expect to have repaid the loan by their eighth year of work.

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15   This is assumed to be 4 per cent per annum, reflecting average inflation of 2.5 per cent per annum and productivity growth of 1.5 per cent per annum. Note that repayment thresholds are also adjusted by AWE so that point at which repayments are made and the rate of compulsory repayment levied remains the same under both approaches.

Figure 3: Expected ICL repayment path for 2 year diploma graduates

Males   Females
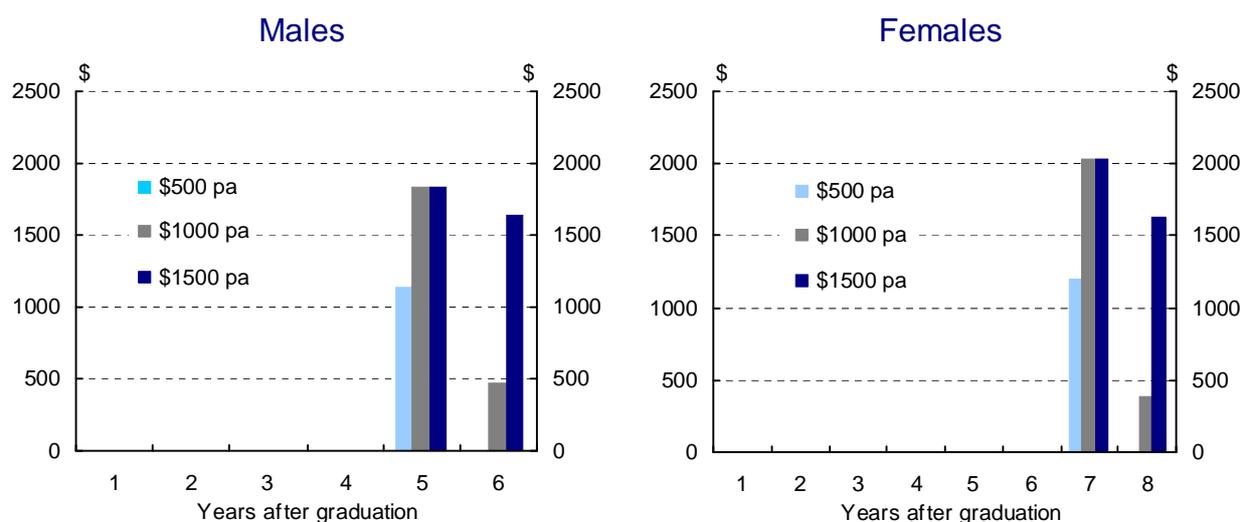
The time taken to repay loans is similar for shorter diploma courses and male Certificate III/IV courses, but increases to 12 years for female Certificate III/IV graduates. Illustrations of other scenarios are provided at Appendix Figure A3.

6.2 Net present value analysis

Since HECS is an interest free loan, the longer it takes to repay the loan, the greater is the subsidy, or equivalently, the cost to government of the provision of the loan due to the absence of a real rate of interest on the debt. Table 7 provides the net present value of total fees for selected VET qualifications under alternative scenarios for annual fees, under both the current 'up-front fee' arrangement and a HECS-style regime. We assume a discount rate of 5 per cent, which is within the range that is commonly applied in this kind of analysis.[16] For diploma qualifications, the subsidy appears to be of the order of 13 per cent for men and 17 per cent for women, the difference reflecting the marginally faster

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16   The choice of discount rate is somewhat arbitrary, and a slightly higher rate could be equally justified. A higher rate would, of course, result in larger estimated subsidies from an income contingent loan.

repayment stream generated by the male earnings profiles. The subsidies are higher for Certificate III/IV qualifications, reflecting the longer period required to repay the loan. In the case of men, the subsidy is around 17.5 per cent while for women the subsidy is a little higher at 25 per cent.

Table 7: NPV of VET qualifications under an ICL

	Total nominal payments	Up-front NPV	HECS NPV		Subsidy (% of total cost)	
			Male	Female	Male	Female
Diploma (2 years)						
Course cost = $500 pa	1,000	976	855	815	12.4	16.6
Course cost = $1000 pa	2,000	1,952	1,701	1,623	12.9	16.9
Course cost = $1500 pa	3,000	2,929	2,536	2,418	13.4	17.4
Assoc diploma (1.5 years)						
Course cost = $500 pa	1,000	976	855	834	12.4	14.5
Course cost = $1000 pa	2,000	1,952	1,703	1,662	12.8	14.9
Course cost = $1500 pa	3,000	2,929	2,537	2,476	13.4	15.4
Certificate III/IV (1 year)						
Course cost = $500 pa	500	500	412	374	17.5	25.1
Course cost = $1000 pa	1,000	1,000	825	749	17.5	25.1
Course cost = $1500 pa	1,500	1,500	1,237	1,123	17.5	25.1

To cast a different light on the magnitude of the subsidy, we ask 'what up-front fee would give the same net present value as under the case with an income contingent loan?' The answers are provided in Table 8. In all cases the annual up-front charge would be lower under this example of an income contingent loan. For example, a 2-year diploma which currently costs $1500 per annum would on average cost $1299 for men and $1239 for women if the charges were calibrated to provide the same net present value as under an income contingent charge. Similarly, the cost of a 1.5-year associate diploma course could be reduced from $1000 per annum to $834 per annum for men and $794 per annum for women if students were to receive the same NPV as with a HECS-style loan arrangement.

Table 8: Course fees that provide the same NPV as under an ICL

	Up-front charge with equivalent NPV as HECS	
	Male	Female
Diploma (2 years)		
Current up-front course cost = $500 per annum	438	417
Current up-front course cost = $1000 per annum	871	831
Current up-front course cost = $1500 per annum	1,299	1,239
Assoc diploma (1.5 years)		
Current up-front course cost = $500 per annum	438	427
Current up-front course cost = $1000 per annum	872	851
Current up-front course cost = $1500 per annum	1,299	1,268
Certificate III/IV (1 year)		
Current up-front course cost = $500 per annum	412	374
Current up-front course cost = $1000 per annum	825	749
Current up-front course cost = $1500 per annum	1,237	1,123

Alternatively, the subsidy could be used to increase funds to the VET sector without increasing the burden on students (in terms of NPV). Table 9 shows the maximum level that fees could be increased to without reducing the benefit (in terms of NPV) that VET students currently receive from their courses. For example, the annual fee for a 2-year diploma could be increased from $1500 per annum to $1732 per annum for men and $1817 per annum for women following the introduction of an ICL, without making students financially worse off. And the cost of a Certificate III/IV course currently costing $1000 could be increased to $1213 for men and $1335 for women under an ICL without reducing the NPV of current course fees.

Table 9: Course fees under an ICL that give the same NPV as under current 'up-front' fees

	Course fee under HECS that yields the same NPV as under current 'up-front' regime	
	Male	Female
Diploma (2 years)		
Current up-front course cost = $500 per annum	571	599
Current up-front course cost = $1000 per annum	1,147	1,203
Current up-front course cost = $1500 per annum	1,732	1,817
Assoc diploma (1.5 years)		
Current up-front course cost = $500 per annum	571	585
Current up-front course cost = $1000 per annum	1,147	1,175
Current up-front course cost = $1500 per annum	1,731	1,774
Certificate III/IV (1 year)		
Current up-front course cost = $500 per annum	606	668
Current up-front course cost = $1000 per annum	1,213	1,335
Current up-front course cost = $1500 per annum	1,819	2,003

It is worth noting that while the subsidy provided by an interest free ICL is significant in terms of individual course costs, it has very little impact on IRR's (See Attachment Table A4). While IRRs to VET qualifications are larger under ICL, the difference is marginal since the direct effect on course costs are dwarfed by the incremental income effect in the IRR calculation.

7.   TOWARDS AN CONTINGENT LOAN FOR VET

In 2005 the Commonwealth government introduced a significant reform to HECS, known as 'FEE-HELP'. FEE-HELP is an important innovation in Australian higher education financing and could be used to introduce an income contingent charging mechanism in TAFE. FEE-HELP works approximately as follows.

Students wanting to enrol in higher education courses with charges not covered by HECS (such as for full-fee paying undergraduates or graduate courses) can have the costs at the point of entry met by the Commonwealth government. In return the student commits to paying the charge through the HECS arrangements, and their debts are recorded in the Australian Tax Office in exactly the same way as if the debt was a HECS debt. In fact, FEE-HELP can be described fairly accurately as HECS with higher charges.

An interesting development is that the FEE-HELP facility has now become available to private universities, such as Bond, and some private training providers, such as religious training institutions. Recently the Australian Council of Private Education and Training (ACPET) has called for FEE-HELP to be made available to the students of all private tertiary education institutions. If and when this happens, TAFE will be sitting in a very strange place, as the only remaining area of Australian post-compulsory education without access to an income contingent loan. This could mean that eventually TAFE would be crowded out by private sector alternatives and cease to be viable as an educational institution.

It would be a straightforward extension of FEE-HELP to allow the loan scheme to be used for TAFE Diplomas and Associate Diplomas. It would work as follows. A TAFE institution would set a fee for a course, as now happens, and the Commonwealth government would offer prospective students access to a FEE-HELP loan. If this is taken up by the student the Commonwealth government pays the TAFE (or the State government) the fee, and the student repays the debt through the HECS system. Just as with HECS there would be no need for there to be individual accounts, because since the initial outlay is provided through the Commonwealth it is sensible that the Commonwealth government is repaid the debt through the Tax Office. What happens to the loan repayments then is a matter for the Commonwealth government.[17]

A final issue for policy is that while the use of the Australian Tax Office for the collection of an income contingent debt is necessary, to do so with respect to TAFE in particular raises some issues concerning Federal and States/Territories jurisdiction. The Commonwealth Government has traditionally not been directly involved in TAFE and it would need to be satisfied that the risks associated with, for example, the level of fees being raised, have been fully thought through.

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17   If FEE-HELP is used instead of a straight application of HECS, the subsidies associated with a zero real interest rate are reduced significantly, since the use of the FEE-HELP facility imposes a 20 per cent surcharge on the debt.

8. CONCLUSION

It has been argued in this paper that the student financing arrangements for VET, and TAFE specifically, sit uneasily with both economic theory and current Australian and many other countries' practice. In particular, it is well recognised that because of the incapacity of capital markets to solve problems of credit constraints for prospective students government intervention in the form of the underwriting or provision of loans is required, but no such intervention exists for VET students.

It has been argued further that loans taking the form with income contingent collection, such as with the case of HECS, are the most appropriate government financing instrument for all tertiary education. We summarised the evidence with respect to the effects of HECS on a range of outcomes, such as aggregate demand for, and rates of return to, higher education, and concerning the implications of the system for the access of poor prospective students. It seems clear that the introduction of, and changes to HECS, have had little discernible effects on private rates of return and aggregate demand for higher education. Perhaps more importantly a range of different studies have revealed that there are no apparent barriers to the poor from the introduction of and changes to HECS with respect to participation in higher education.

Our empirical analysis is motivated by the need to establish the existence and extent of private rates of return to investment in VET, since if these do not exist the case for charging — no matter what financing arrangements are to be used — sits on weaker grounds. With the use of the HILDA data set we estimated a series of fairly complicated wage equations to determine the returns

to VET qualifications, as measured by the existence of TAFE diplomas, associate diplomas and certificates.

With a range of hypothetical education path counter-factuals it is apparent that the internal rates of return are quite healthy at the mean (that is, as estimated with OLS) for both men and women. For example, diplomas and associated diplomas are associated with internal rates of return of around 8-10 per cent per annum for men, and about 10-14 per cent per annum for women. These are roughly comparable to those usually estimated with respect to investments in undergraduate higher education degrees. Employing quantile regression techniques we have been able to illustrate that these rates of return differ significantly across the entire wage distribution, but nevertheless remain quite robust and familiar.

We then used the regression results to illustrate the extent of implicit subsidies involved in an application of current HECS arrangements for the collection of a VET debt. Our approach involved calculations of the present value of levels of debt resulting from the imposition of different nominal charges for diplomas, associate diplomas and certificate TAFE courses. The extent of the implicit public sector financial assistance and the associated time streams of repayments of the debt are such as to suggest that HECS for TAFE would deliver acceptable levels of subsidies with respect to the budget. This part of the exercise, coupled with the compelling arguments for policy reform towards an income contingent loan for the sector, make robust the case for continuing to question the acceptability of current arrangements.

APPENDIX: SUPPLEMENTARY TABLES AND CHARTS

Table A1: Regression results for OLS wage equations
(Dependent variable is the log of full-time weekly wages)

	Male		Female	
	Coefficient	t-stat	Coefficient	t-stat
Constant	3.53	20.73	3.75	25.78
Educational attainment				
Higher degree	0.72	8.92	0.91	11.70
Postgraduate diploma	0.66	8.19	0.87	11.87
Degree	0.61	7.98	0.80	11.19
Diploma	0.39	6.23	0.41	5.96
Certificate III/IV	0.24	3.93	0.26	3.91
Certificate I/II	0.07	1.13	0.28	4.09
Certificate (level unknown)	0.15	2.27	0.33	4.52
Completed school	0.24	11.72	0.16	6.92
Experience				
Experience	0.14	12.15	0.13	8.65
$\text{Experience}^2/100$	-0.87	-8.41	-0.82	-5.61
$\text{Experience}^3/1000$	0.23	6.97	0.22	4.27
$\text{Experience}^4/10000$	-0.02	-6.27	-0.02	-3.55
Uni*Experience	-0.03	-1.34	-0.09	-4.20
Uni*$(\text{Experience}^2/100)$	0.23	1.13	0.72	3.36
Uni*$(\text{Experience}^3/1000)$	-0.07	-0.92	-0.21	-2.85
Uni*$(\text{Experience}^4/10000)$	0.01	0.71	0.02	2.51
VET*Experience	-0.02	-1.29	-0.04	-1.88
VET*$(\text{Experience}^2/100)$	0.18	1.24	0.29	1.48
VET*$(\text{Experience}^3/1000)$	-0.06	-1.24	-0.09	-1.28
VET*$(\text{Experience}^4/10000)$	0.01	1.25	0.01	1.18
Hours of work				
Hours	0.10	10.83	0.09	11.37
$\text{Hours}^2/100$	-0.11	-7.66	-0.11	-7.90
$\text{Hours}^3/1000$	0.00	5.51	0.00	5.35
Observations	5998		3570	
Adjusted R^2	0.40		0.40	

Figure A1: Selected earnings profiles from raw data

Panel A: Males

Panel B: Females
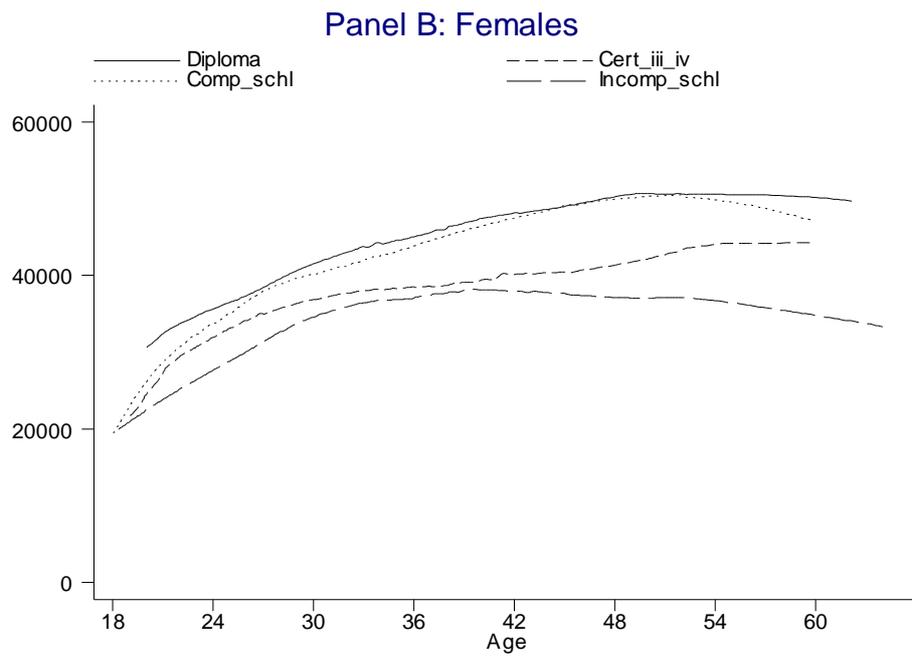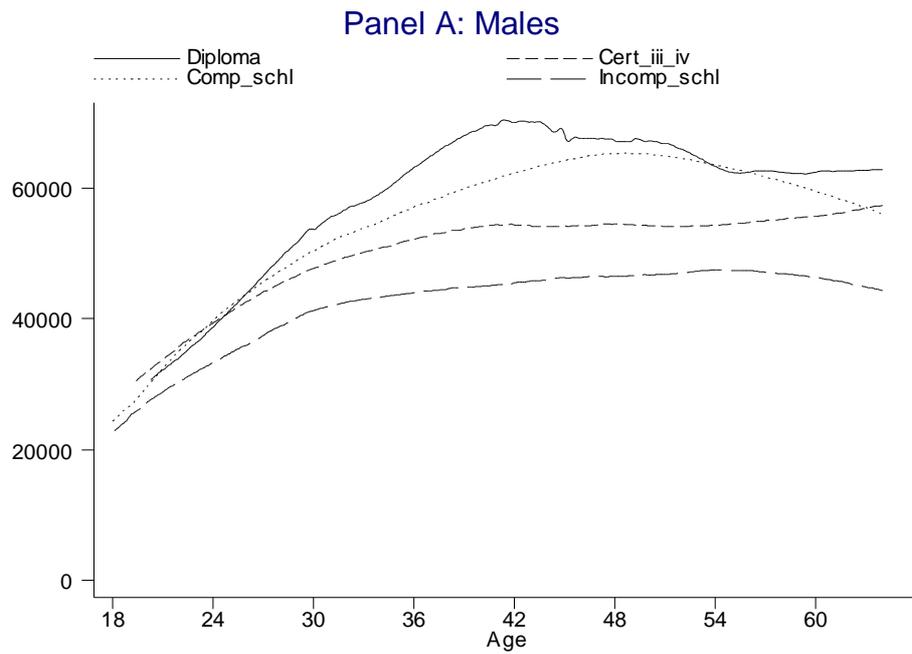
Table A2: Quantile regression results for wage equations
(Dependent variable is the log of full-time weekly wages)

	Male			Female		
	Q25	Q50	Q75	Q25	Q50	Q75
Constant	2.82 **	3.55 **	4.14 **	3.06 **	3.49 **	4.14 **
Educational attainment						
Higher degree	0.93 **	0.80 **	0.56 **	0.86 **	0.89 **	0.81 **
Postgraduate diploma	0.83 **	0.72 **	0.51 **	0.80 **	0.83 **	0.71 **
Degree	0.78 **	0.71 **	0.52 **	0.72 **	0.78 **	0.69 **
Diploma	0.34 **	0.43 **	0.48 **	0.35 **	0.44 **	0.46 **
Certificate III/IV	0.19 **	0.26 **	0.33 **	0.20 **	0.28 **	0.34 **
Certificate I/II	0.06	0.12 *	0.18 *	0.22 **	0.29 **	0.30 **
Certificate (level unknown)	0.08	0.21 **	0.26 **	0.27 **	0.33 **	0.38 **
Completed school	0.23 **	0.24 **	0.24 **	0.10 **	0.15 **	0.21 **
Experience						
Experience	0.14 **	0.13 **	0.12 **	0.14 **	0.13 **	0.11 **
Experience^2/100	-0.84 **	-0.78 **	-0.75 **	-0.97 **	-0.80 **	-0.62 *
Experience^3/1000	0.21 **	0.21 **	0.21 **	0.28 **	0.22 **	0.16
Experience^4/10000	-0.02 **	-0.02 **	-0.02 **	-0.03 **	-0.02 **	-0.02
Uni*Experience	-0.08 **	-0.05	0.00	-0.08 **	-0.09 **	-0.05
Uni*(Experience^2/100)	0.53 *	0.38	0.02	0.62 **	0.67 **	0.33
Uni*(Experience^3/1000)	-0.14	-0.12	-0.02	-0.18 *	-0.20 *	-0.10
Uni*(Experience^4/10000)	0.01	0.01	0.00	0.02	0.02 *	0.01
VET*Experience	0.00	-0.02	-0.05	-0.04	-0.04 *	-0.05
VET*(Experience^2/100)	0.03	0.12	0.39	0.37	0.29	0.29
VET*(Experience^3/1000)	-0.01	-0.03	-0.12	-0.13	-0.07	-0.08
VET*(Experience^4/10000)	0.00	0.00	0.01	0.01	0.01	0.01
Hours of work						
Hours	0.12 **	0.09 **	0.07 **	0.12 **	0.11 **	0.08 **
Hours^2/100	-0.16 **	-0.11 **	-0.08 **	-0.16 **	-0.15 **	-0.09
Hours^3/1000	0.01 **	0.00 **	0.00 **	0.01 **	0.01 **	0.00
Observations		5998			3570	
Pseudo R^2	0.26	0.26	0.25	0.28	0.30	0.28

* denotes statistical significance at the 5 per cent level.

** denotes statistical significance at the 1 per cent level.

Table A3: Interpretive statistics from quantile regressions

	Male			Female		
	Q25	Q50	Q75	Q25	Q50	Q75
Educational attainment						
(% difference in wages relative to individuals that did not complete school)						
Higher degree	153	122	75	137	144	124
Postgraduate diploma	130	106	66	123	130	103
Degree	118	104	68	105	119	100
Diploma	41	54	62	42	55	59
Certificate III/IV	21	29	39	22	33	41
Certificate I/II	7	13	20	25	34	35
Certificate (level unknown)	8	24	29	31	40	46
Completed school	25	27	28	10	16	23
Experience						
(% change in wages for a marginal increase in experience at selected levels of experience)						
University						
1 year	6.6	8.1	12.7	5.3	3.6	5.6
3 years	5.4	6.6	9.8	4.0	3.1	4.5
5 years	4.4	5.3	7.4	3.0	2.7	3.6
10 years	2.6	2.8	3.2	1.4	1.7	1.9
20 years	0.8	0.6	0.1	0.6	0.5	0.3
VET						
1 year	14.3	13.0	12.3	9.5	7.9	6.1
3 years	11.0	10.0	9.3	7.2	6.0	4.9
5 years	8.2	7.5	6.9	5.3	4.5	3.9
10 years	3.5	3.2	2.9	2.1	1.8	2.0
20 years	0.2	0.4	0.5	0.0	0.4	0.5
No post-school qualifications						
1 year	13.9	11.1	7.4	13.7	12.5	10.8
3 years	10.6	8.5	6.0	9.9	9.4	8.4
5 years	8.0	6.4	4.8	6.9	6.9	6.4
10 years	3.3	2.9	2.6	2.1	2.6	2.9
20 years	-0.1	0.4	0.9	-0.2	-0.1	0.3

Figure A2: Selected age-earnings profiles from quantile regressions
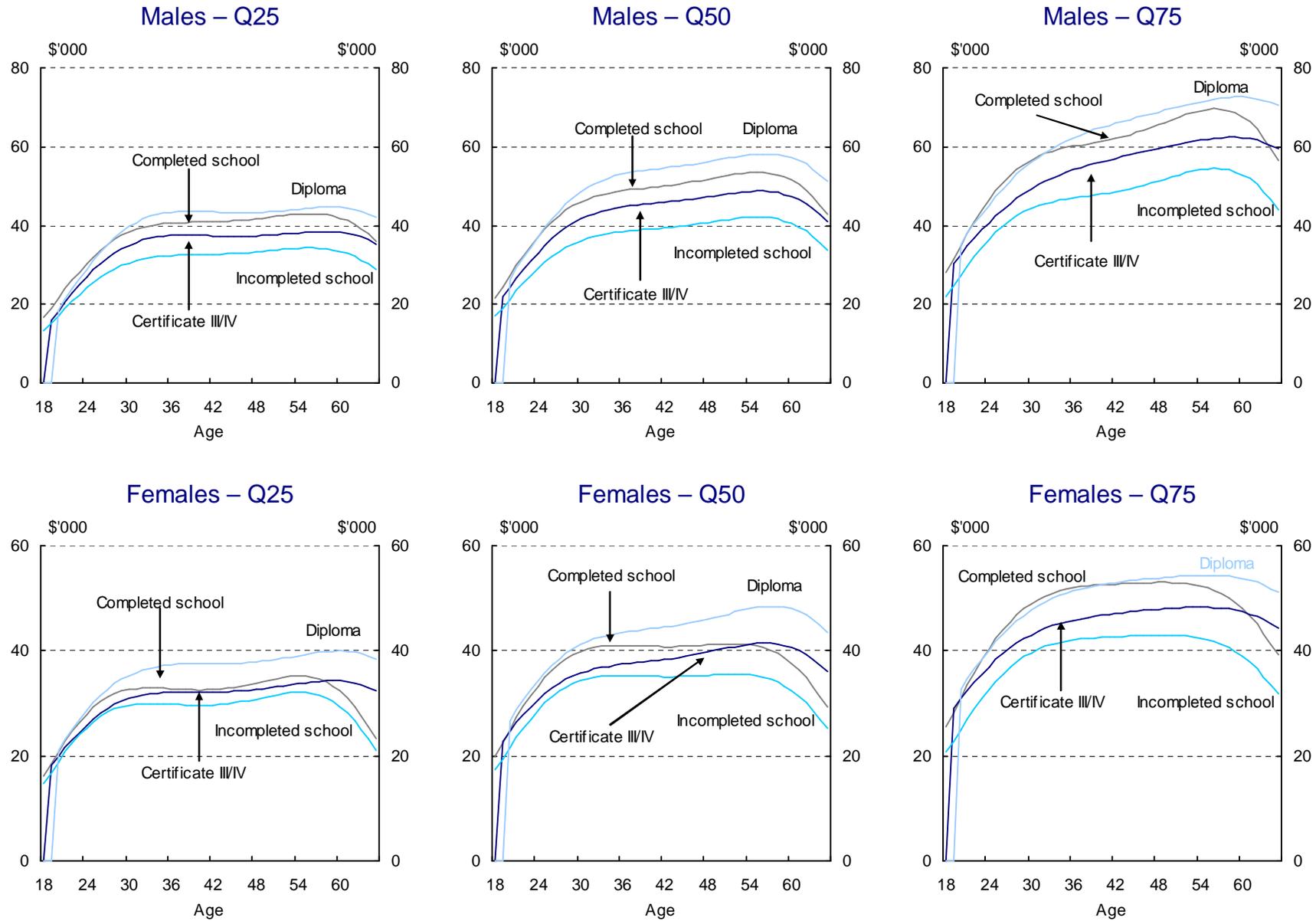
Figure A3: Expected ICL repayment paths for selected VET qualifications

Associate diploma (1.5 years)

Males

Females

Certificate III/IV (1 year)

Males
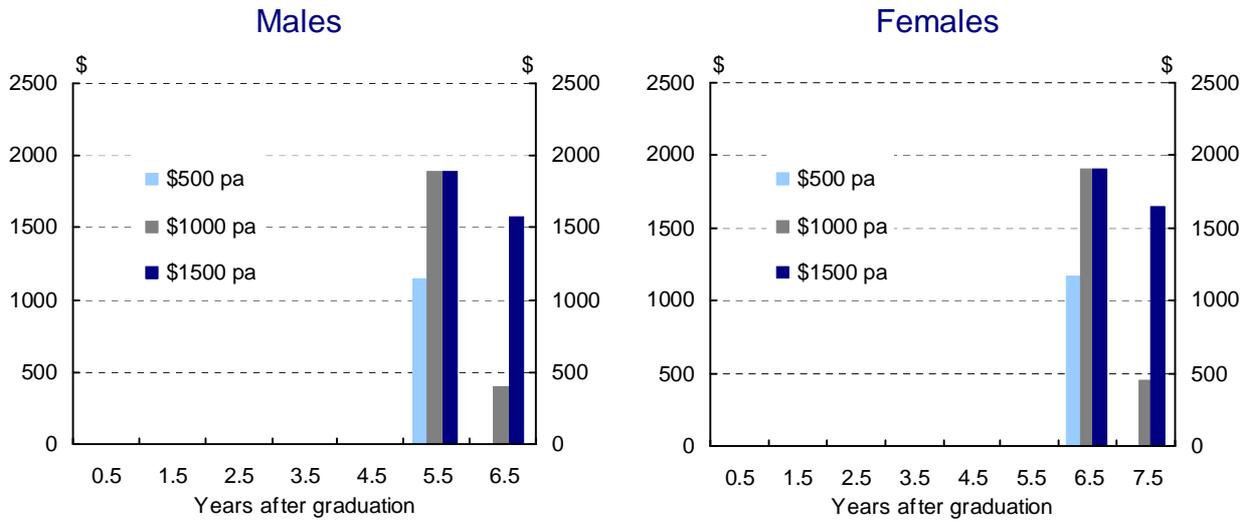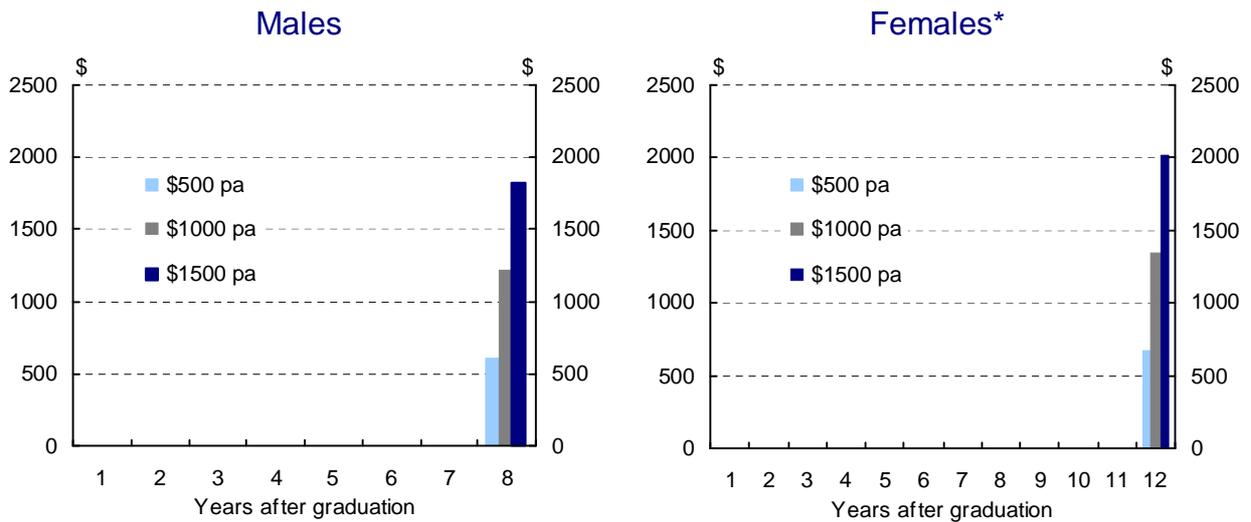
Females*

* Debt is never repaid as income never rises above prescribed threshold

Table A4: IRRs for selected VET qualifications under alternative funding regimes

	Male		Female	
	No HECS	HECS	No HECS	HECS
Diploma (2 years)				
Course cost = $500 per annum	7.7%	7.7%	10.5%	10.5%
Course cost = $1000 per annum	7.6%	7.6%	10.3%	10.4%
Course cost = $1500 per annum	7.5%	7.6%	10.1%	10.3%
Assoc diploma (1.5 years)				
Course cost = $500 per annum	10.1%	10.2%	14.3%	14.6%
Course cost = $1000 per annum	10.0%	10.1%	14.0%	14.4%
Course cost = $1500 per annum	9.8%	10.0%	13.6%	14.2%
Certificate III/IV (1 year)				
Course cost = $500 per annum	37.3%	38.7%	31.8%	33.5%
Course cost = $1000 per annum	35.9%	38.6%	30.3%	33.4%
Course cost = $1500 per annum	34.7%	38.4%	28.9%	33.3%

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