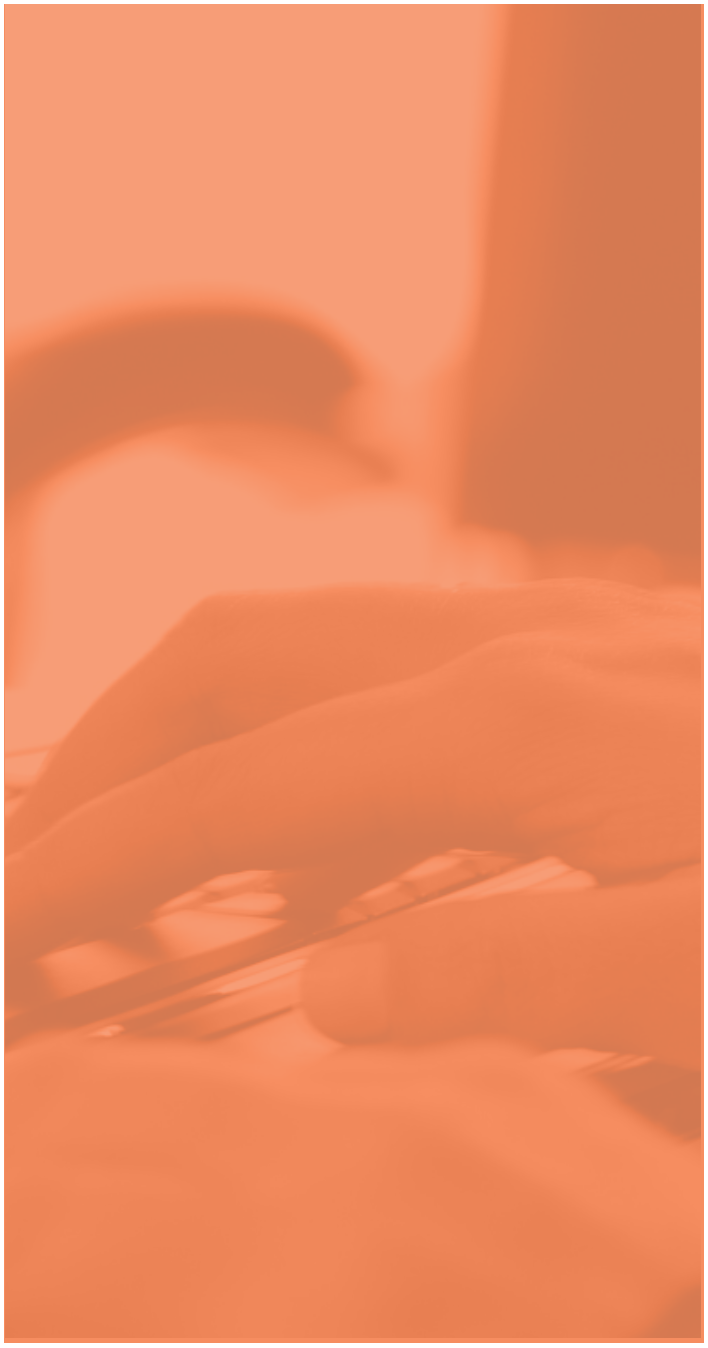
Outcomes from combining work and tertiary study



MELBOURNE INSTITUTE OF APPLIED ECONOMIC AND SOCIAL RESEARCH

Cain Polidano

Rezida Zakirova

A NATIONAL VOCATIONAL EDUCATION AND TRAINING RESEARCH AND EVALUATION PROGRAM REPORT

NCVER

Australian Government
Department of Education, Employment and Workplace Relations

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About the research

Outcomes from combining work and tertiary study

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Working in some capacity is almost considered de rigueur for tertiary students. The reasons for working and the impact this has on both an individual's ability to complete their studies and on their post-study labour market outcomes are only recently receiving attention.

Using the 1995 and 1998 cohorts of the Longitudinal Surveys of Australian Youth (LSAY), this study investigates the motivations for and the education and employment outcomes from working while studying for both vocational education and training (VET) and higher education students. The authors find that income is an important motivating factor: those in receipt of income support are less likely to work while studying, although this is dependent on whether the student is still living at home.

Key messages

- For those studying full-time, working impacts on completion—the more hours worked, the greater the effect. For example, working 16–24 hours a week reduces the completion rate by eight percentage points, while more than 24 hours reduces it by 14 percentage points.
- Finding work in a job considered a 'career' job while studying has a significant and positive impact on course completion for both VET and higher education students.
- For all tertiary students, being employed in the final year of study improves the chances of finding full-time employment, even three years after completing the course.
- Interestingly, for both full- and part-time students, the longer they have been employed in a job, the greater the likelihood of course completion, while past work experience also increases the likelihood of completion for full-time students (2.5 percentage points per year of employment). Perhaps this reflects that these students have better time management skills.

Thus it is clear that combining study and work does have significant effects on completion and future employment prospects. Too much work negatively impacts on study completion, but on the other hand work experience does benefit future job prospects. The ideal combination would be modest hours of work in a job relevant to a future career—but this will be difficult to achieve for many students.

Tom Karmel
Managing Director, NCVER

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Background

For the majority of tertiary students aged 25 and younger in Australia, working while studying is the norm; however, the motivating factors and educational and post-study labour market outcomes of working during this period of their lives are largely unknown. For young people, the chance to experience work is likely to help them to develop both general and job-specific skills that will help them successfully transit into the labour market after study. On the downside, there is also the risk that time spent in work may take away from time studying, thereby reducing chances of completion and damaging future labour market prospects. For policy-makers, understanding motivations and measuring outcomes is important for designing policies for youth that on one hand provide them with support to complete their studies but, on the other, do not diminish the benefits of work.

This is the first study in Australia to use multivariate analysis to examine motivations and education and employment outcomes from working while studying for both vocational education and training (VET) students (excluding apprentices and trainees) and higher education students aged 25 years and under. It is important to try and eliminate the effects of confounding factors—factors that are related to both working and outcomes—that distort the relationship between outcomes and work while studying. In contrast to descriptive statistics, the use of multivariate analysis allows us to determine whether any observed relationship between hours of work and course completion, for example, is due to hours of work or a third variable, such as socioeconomic background.

We use the 1995 and 1998 cohorts of the Longitudinal Surveys of Australian Youth (LSAY) to undertake this work. LSAY contains detailed individual information on youth, including information on socioeconomic status and past education outcomes (including university entry scores). Another key feature of LSAY is that it tracks the same individuals from the time they are 15 (in 1995 and 1998 for the two cohorts respectively) until they are 25. This longitudinal aspect is important in the context of this study because we examine employment outcomes from combining work and study up to three years after completion. Taking a longer-term view helps give a clearer picture of potential employment benefits, as it is likely that any initial benefits will diminish over time.

Motivations for combining work and study

Consistent with the findings of the Australian House of Representatives Standing Committee on Education and Training (2009), we find that, for those aged 25 and under in their first tertiary course, the socioeconomic status of parents (measured by employment status, job prestige and highest level of education achieved) has very little bearing on the choice of work and study combination. This suggests that students are not motivated by financial need. Instead, we find that receipt of Youth Allowance (means-tested income support for students) and culture are important factors in the choice of work and study combinations. Overseas-born youth are estimated to be ten percentage points less likely to combine work and study (either by enrolling full-time and working part-time or enrolling part-time and working) than Australian-born students.

Similarly, those who receive Youth Allowance are less likely to combine work and study, but the degree of lower participation in work among Youth Allowance recipients depends on whether they

are living with their parents or not. For those who live with their parents, receiving Youth Allowance reduces their likelihood of choosing to combine work and study by 20 percentage points, whereas those who do not live at home and receive Youth Allowance are 13 percentage points less likely to combine work and study. The smaller impact of Youth Allowance on the choice to combine work and study for those living away from home is likely to be because these students face higher costs of living than those living at home, which necessitates some work. Those who receive Youth Allowance are also less likely to choose work and study combinations that require a considerable commitment of time in work, such as working more than 16 hours (roughly two days) a week, and studying full-time or working full-time and studying part-time. However, we cannot conclude whether the relationships between Youth Allowance and choice of work and study combinations are causal. It is possible that students who choose more onerous work commitments prefer working longer hours because, for example, they have greater financial commitments and hence forego receiving Youth Allowance.

Compared with higher education students, we find that VET students are eight percentage points less likely to combine work and study. However, those who do are seven percentage points more likely to combine work and *part-time* study. The preference for part-time study for VET students may be because more of them already have ongoing full-time employment, but it may also be because many have to pay up-front fees.[1]

Educational outcomes

After controlling for differences between VET and higher education students, including academic ability, we find that full- and part-time VET students aged 25 and under in their first tertiary course are around ten percentage points more likely to complete than their higher education counterparts.[2] The higher completion rates among this group of VET students may be due to a number of reasons, including the shorter duration of the courses, differences in the academic demands of the courses and differences in the flexibility and modes of course delivery. In general, the modularised nature of VET means that courses can be better tailored to individual training needs and are delivered in a greater range of modes, especially off-campus delivery modes.

After controlling for differences between those who choose different work and study combinations, including academic ability, course load, courses types and field of study, we find that for those aged 25 and under in their first tertiary course, working while studying can reduce the chances of completing, but it depends on the hours worked. For full-time students, we find that compared with those who do not work while studying, those who work up to eight hours (roughly a day) a week on average while studying are just as likely to complete, while those who work more than eight hours are less likely to complete; that is, those working 8.1 to 16 hours (roughly two days) a week, 16.1 to 24 hours (roughly three days) a week and those working more than 24 hours a week are five percentage points, eight percentage points and 14 percentage points less likely to complete, respectively. For part-time students, due to the small number of observations, the only comparison is between those who work fewer than 32 hours per week (part-time workers) and those who work more than 32 hours (full-time workers).[3] We estimate that part-time students who work full-time are around 12 percentage points less likely to complete than those who work fewer than 32 hours per week. From tests performed, we find no evidence that these results are affected

[1] At the time the data were collected, there was no loans scheme (like HECS available to higher education students) for VET students to defer the payment of fees.

[2] It is important to note that the estimated higher completion rate for VET only applies to the sample under consideration: those 25 and under who are not enrolled in an apprenticeship or traineeship.

[3] The few students who study part-time and who do not work are omitted from the study because their number is too small to warrant detailed analysis and their circumstances are likely to be quite different from the typical part-time student.

by self-selection bias—the presence of unobserved factors that affect both the choice of average hours worked and course completion.

We find that, generally speaking, there are no differences in the ability of full-time VET students and full-time higher education students to manage work and study. However, we find that part-time VET students who work full-time (work more than 32 hours per week on average over their course) are around 15 percentage points more likely to complete than part-time higher education students who work full-time. To complete a qualification part-time while working full-time requires considerable effort and application and the longer duration of higher education courses may make the required commitment more taxing. The relatively long commitment required to obtain a higher education qualification part-time may also mean that employers are less likely to support full-time employees who choose this education pathway.

Importantly, we find that, for both VET and higher education students, the type of work performed while studying has a significant bearing on completion. Full-time students who find a job they would like as a career while studying (around 12% of both VET and higher education students) are estimated to be around four percentage points more likely to complete study than those who work in a job that is not a career job, while the same effect for part-time students is around ten percentage points. A possible explanation is that most of those who find a career job while studying find work in professional jobs, especially in the areas of information technology, engineering, and architecture and building, which tend to require the attainment of a qualification for post-study employment. Therefore, the prospect of converting their jobs to ongoing employment after study may give them an added incentive to complete over those who work in non-career jobs. If this interpretation is correct, this result underlines the importance of creating more opportunities for students to gain experience working in jobs that they would like as a career.[4]

A consistent result for part- and full-time students is that the longer an individual has been in the job, the greater the chance of completion. A possible explanation is that the more established an individual is in the job, the more support they may get from their employer in the form of more flexible working hours or possibly time off work, in the case of full-time employees. Similarly for full-time students, the more years of employment experience, the greater the chance of completion. The importance of work experience may be linked to the development of 'soft skills', such as time management, commitment to completing a task, communication and interpersonal skills and self-esteem, which may help academic performance. Alternatively, the relationship may not be causal, but instead related to uncontrolled differences in the characteristics of students who have and have not a history of working; for example, differences in motivation.

Employment outcomes

Results suggest that employment in the last year of study significantly improves the chances of finding full-time employment in the first year out from study, but that, for higher education students, the magnitude of benefits depends heavily on the nature of the job while studying. Compared with those who were not working in their last year of higher education, those who were casually employed in a career job and those employed in a non-career job are estimated to be 74 percentage points and 25 percentage points more likely to be in employment in their first year out, respectively. For VET students, working in a casual career job and working in a non-career job in the last year of study is associated with a 68-percentage point and a 65-percentage point higher probability of full-time employment, respectively, in the first year out. We find that working in the last year of study also has longer-term benefits for the chances of being in full-time employment, but that these benefits diminish over time.

[4] Although we control for academic ability in the form of university entry scores (or combined Year 9 numeracy and literacy scores if entry scores are missing), we cannot rule out the possibility that those who find career jobs while studying are better-performing students and who are therefore more likely to complete.

There are a number of possible explanations for why the initial employment benefits to higher education depend more heavily on the type of work performed. First, employers of higher education graduates may not value general skills developed from working in a non-career job to the same degree as employers of VET graduates. Second, employers of higher education graduates may value general skills highly, but consider course completion as a better measure of these skills than working in non-career jobs while studying. Finally, although they report that they do not want the job as a career, VET students, by comparison with higher education students, may be more likely to derive job-specific skills that are recognised by employers from a non-career job.

A note of caution when interpreting the employment benefits of combining work and study in this report: while the estimated benefits appear large, especially in the initial period, we cannot rule out the possibility that some, if not all, of the estimated benefit is due to uncontrolled factors, such as personality traits, that affect both employment while studying and employment shortly after studying.

Introduction

In Australia, around 70% of youth in tertiary study (aged between 20 and 24) have a part or full-time job (ABS 2008). While students report working for a range of reasons, typically they do not report working to fund basic necessities (see, for example, Abhayaratna et al. 2008; Dwyer et al. 1999; Robinson 1996). Despite the high rate of participation in work, little is known about its effects on student education and employment outcomes. Combining work with study is likely to have both positive and negative effects on the short- and longer-term outcomes of students. For example, on the positive side, skills and connections made through working while studying may increase the chances of finding post-study employment. On the negative side, working can impact on the time available for study, recreation and socialising, which may reduce the chances of completing study and hence finding employment after study. Finding the right balance between work and study is not easy and may depend on a number of individual factors, such as the time spent in work, the type of work performed, course demands, academic ability, past experience in the labour market, intended future career paths, course fees, other time commitments and the availability of other forms of financial support.

The aim of this project is to contribute to the understanding of the choice of work and study combinations of vocational education and training (excluding apprentices and trainees) and higher education students and their impacts on educational and employment outcomes (which was a key recommendation of the recent House of Representatives Standing Committee on Education and Training [2009]). We use the Longitudinal Surveys of Australian Youth (LSAY) (1995 and 1998 cohorts[5]) with multivariate regression techniques to undertake this analysis. The panel nature of LSAY allows us to examine how work and study combinations affect subsequent employment outcomes, while the richness of the data enables us to control for a range of personal differences between individuals such as socioeconomic background and academic ability which may also affect completion and employment outcomes.

Findings from this study may be used to evaluate the need for, and the type of, possible government intervention. Government intervention may be necessary if combinations of work and study are not in the best interests of young people, measured as post-education employment outcomes. Young people may make poor decisions if they are unable to assess the impacts of combining work and study wisely, are coerced by employers into working too many hours, or are reliant on the income to remain in study. From a policy perspective, helping young people to find the right balance between study and work will not only benefit affected students, but will help ensure that the future labour market is well skilled, which will have flow-on benefits for future labour market participation and social inclusion.

An important contribution of this paper is that it considers the outcomes from combining study and work for tertiary students; Australian studies to date have mainly focused on outcomes for secondary school students. Moreover, we consider the outcomes for VET students separately from those for higher education students.

[5] The 1995 cohort was surveyed annually from 1995 to 2006; the 1998 cohort has been surveyed annually from 1998 to 2008.

Literature to date

Before examining the effect that combining work and study may have on study and employment outcomes, it is pertinent to examine briefly what work has already been undertaken in this area.

Employment benefits of combining work with study

When surveyed, students often give a number of reasons for working while studying but, generally speaking, the reasons are not related to financial necessity. In the main, students report that they work because it gives them financial independence from their parents, it improves their self-esteem, it improves their chances of finding work after study and they enjoy it (Abhayaratna et al. 2008; Dwyer et al. 1999; House of Representatives Standing Committee on Education and Training 2009; Robinson 1996).

While there may be a range of personal benefits to students, we focus only on the employment benefits of combining work and tertiary study. In general terms, we may assume that tertiary students who work may develop both general and job-specific skills relevant to their post-study employment prospects. General skills, or 'employability' skills, refer to broad generic work-related competences and personal attributes such as communication skills, teamwork skills, problem-solving skills etc. which are valued by employers (Sweet 2008).

While general skills may benefit all students because they are relevant to all employers, job-specific skills developed by combining work with study will only benefit those who are working in a job relevant to their post-study career. The extent to which tertiary students may benefit from job-specific skills is a key issue to be addressed in this study and is measured by whether students report working in a job that they would like as a career. A limitation of this measure is that it is a binary measure of the relevance of the work to a student's post-study career plans. This means that students may develop some skills relevant to their chosen career path, but still report that the job is not one that they would like as a career. Ideally, we would use a measure that asks students to evaluate, on a scale, the relevance of the job to their career plans.

While it is likely that the employment benefits from combining work with study will be greater if a student can find a job that matches their post-study career interests, estimating such an effect for VET students is complicated because some may have found a 'career job' prior to study. In some cases, VET students may choose to study to meet the training needs of their career job, which will over-inflate the estimated employment benefits of combining work with study and underestimate any employment penalty from course non-completion.

Empirical evidence on the benefits of working while studying to date is limited to part-time work while at school. In the international literature, there is evidence of strong positive short- and longer-term benefits on employment and wages (Carr, Wright & Brody 1996; Meyer & Wise 1982; Ruhm 1997). In Australia, Vickers, Lamb and Hinkley (2003), used LSAY (1995 cohort) and a multivariate framework to examine the relationship between working while at school and student outcomes in the first year after completing school. Results from this study show that, of those who do not go on to further study, students who worked while in school were 46% more likely to be in employment than those who did not work. Similarly, Robinson (1996) found that students who worked part-

time while in Year 11 were less likely to be unemployed in their first year out and were less likely to experience spells of unemployment.

Evidence of employment benefits from working while in tertiary education is only anecdotal. In a survey of Australian VET students, Dwyer et al. (1999) found that students recognised the importance of obtaining a work record for their future employment prospects, but claimed that the 'on the job' skills they developed were not relevant to their training. Similarly, McInnis and Hartley (2006) found evidence that some higher education students are motivated to work for job-specific employment benefits. In particular, they found evidence in competitive areas, such as commerce, that some students in their last year of study would seek more professionally oriented part-time work to try and 'get a foot in the door'.

Impacts on education outcomes

In theory, time spent in work is at the expense of time spent studying and time spent in recreational activities, such as socialising with peers and on-campus activities, which can affect student performance and attachment to the course, respectively (Tinto 1993). In terms of empirical studies, there is a substantial body of work on the impacts of work on higher education student performance and course completion using longitudinal data, especially in the United States (for a review of this literature, see Riggert et al. 2006). However, the findings of these studies are inconsistent, reflecting differences in approach.

In Australia, Marks et al. (2000) and Robinson (1999) both used longitudinal data and found that those who worked in a part-time job in Year 11 were just as likely to complete secondary school as those who did not work in Year 11. However, Robinson (1999) did find that those who spent more than ten hours a week in employment were slightly less likely to finish secondary school compared with those who did not work. This result is consistent with the findings of Vickers, Lamb and Hinkley (2003) who examined the effect of working while in higher education. Using a multivariate model, Vickers, Lamb and Hinkley (2003) found that, after controlling for course contact hours and field of study, working 20 hours per week or more doubles the likelihood of dropping out of higher education compared with those who do not work. However, there is no significant effect estimated for those who work fewer than 20 hours compared with those who do not work. In their multivariate analysis, Vickers, Lamb and Hinkley (2003) also included VET students in their sample alongside higher education students and found smaller impacts (compared with results with higher education students only), which led them to conclude that the impacts of work on VET completion rates may be smaller. However, they did not include an interaction term to test this hypothesis.

It is important to note that these results do not control for the possibility of self-selection bias. It is important to note that these results do not control for the possibility of self-selection bias. Self-selection occurs when there are factors present that affect both the hours of work selected and the chances of completion, but are not controlled for in the regression. An example may be an individual's attachment to their course. If they are not enjoying their course, all else being equal, they have a lower chance of completing because they will not see the benefit of pursuing a career in this area. At the same time, because they do not enjoy time studying for the course, they may tend to work longer hours. In this case, without controlling for course attachment, the estimated impacts of work on course completion will be over-estimated.

However, we note that this is just an example and there may be a host of other uncontrolled factors that may be related to both the choice of hours and academic performance. Therefore, we cannot be certain of the direction of any bias in the above studies but, suffice to say, any bias present will depend on the nature of the controls used. This study is the first that we are aware of which attempts to deal with the issue of self-selection in the choice of working hours in determining student outcomes.

If all of the differences related to hours of work cannot be controlled for (which they cannot using available datasets), then the estimated impacts of combining work and study will be biased to some degree because differences in student outcomes will be related not only to the hours of work, but to differences in the characteristics and circumstances of those who choose various levels of work. The direction of any bias is unclear. On the one hand, if the choice of hours worked while studying is driven mainly by attachment to their course, then we may expect that the bias will result in an overestimate of the impacts of combining work and study if those with weak attachment choose to work longer hours. On the other hand, if those who are better able to cope with work and study work longer hours, then the bias will underestimate the true impacts of combining work and study. In practice, the direction and extent of any bias will depend upon the nature of controls, which is probably why the empirical results to date are inconclusive. This study is the first that we are aware of which attempts to deal with the issue of self-selection in the choice of working hours in determining student outcomes.

Data and sample

Given that we are interested in the effects on youth transitions of combining work and post-school study, the most suitable datasets available are the Longitudinal Surveys of Australian Youth (LSAY). These datasets track individuals for ten years, from the time they are in Year 9 until they have left study. Because the data are longitudinal, they are ideal for tracking transitions from education into employment. To take advantage of all available data and to maximise the robustness of our results, we combined the 1995 and 1998 cohorts. Only variables of interest that were common across the two datasets were merged. To control for differences in the sample that may be due to differences in the survey methodology between the two cohorts, we derive a binary identifier for use in the multivariate analysis.

The sample

The sample of interest in this study is all tertiary students up until they are approximately 25 years old. A tertiary student is an individual who is observed to have been enrolled in study that leads to a qualification and has stopped, regardless of whether they completed or not. If an individual reports to have stopped studying since the last interview, regardless of whether they completed or not, and currently reports to be studying a different course, two separate courses are recorded for the same student. Courses that do not lead to a nationally recognised qualification upon completion, such as short courses and modules, are not included as courses. For comparison, courses are classified as either in VET or in higher education, where VET is identified as being certificates level I–IV, diploma and advanced diploma, and higher education is a bachelor degree or above.

A tertiary course is identified in LSAY when an individual reports being in post-school education at the time of interview, or when they report to have participated in education in between survey periods. However, in the latter case, we do not directly observe employment details while studying. If at the point of interview an individual who was in study between survey waves reports to be working in the same job as in the previous interview, we assume that their current employment conditions are the same as those while studying. Those who undertook study after the previous interview and changed jobs are omitted from the sample (114 spells of study in one or more courses). Failure to include spells that occurred in between interview periods would be likely to bias the sample because short spells (such as spells of VET and spells that did not lead to a qualification) would be underrepresented.[6]

While we endeavour to retain as many courses as possible in the sample, we omit 571 courses for which, in the last year of study, there is missing information on: course completion; the type of qualification attained; whether study was full or part-time; employment status; or average hours worked per week. In the main, information is missing because of survey attrition and other forms of non-response. However, we note that individuals who have missing observations for variables that are not as crucial, such as field of study, are not omitted. For these variables, the effect of

[6] We acknowledge that, by retaining these short spells of study, there is a risk of error in the working arrangements while studying. However, we consider the bias from the errors on the analysis to be less potentially troublesome than bias from omitting the short spells.

missing information on study and employment outcomes is dealt with in the multivariate analysis by including separate 'missing information' categories.

Table 1 Frequency of course enrolments in the sample

	VET						Higher education					
	Full-time		Part-time		Total		Full-time		Part-time		Total	
	Count	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*
No. of courses												
1	944	76	378	58	1322	70	4087	86	499	66	4586	83
2	257	21	234	36	491	26	603	13	224	30	827	15
3	40	3	35	5	75	4	76	2	34	4	110	2
4	4	0	6	1	10	1	9	0	2	0	11	0
5	0	0	2	0	2	0	0	0	0	0	0	0
Total	**1245**	**100**	**655**	**100**	**1900**	**100**	**4775**	**100**	**759**	**100**	**5534**	**100**

Source: LSAY 1995 and 1998 cohorts.

Overall, there are 7434 courses undertaken in our sample: 1900 are VET courses and 5534 are higher education courses (table 1). An important point of note is that 70% of VET courses and 83% of higher education courses are the first tertiary courses undertaken by students and the remainder are subsequent courses. For the purposes of this analysis, we restrict analysis on the choice and academic outcomes of work and study combinations to those students undertaking their first tertiary course. We choose the first tertiary course to put VET and higher education students on equal footing, given that most higher education students only undertake one course.[7] When examining the employment outcomes from combining work and study, we use the study and work combinations from an individual's most recently finished spell of education in the survey to gain a truer picture of how working while in study affects post-study employment outcomes.

An important issue in the context of this study is when should comparisons between students be made, given that course duration varies? When examining post-study employment outcomes, we pay most attention to the effect of work in the last period of study because it is likely to exert the most influence, but also include information on employment history. Further, we choose the last period because most VET courses typically run for between six and 18 months, which means that the last year of study is the only one available for many VET spells. For analysis on completion, categorising work while studying is more complicated because the choice to work and choice of hours may be related to the academic performance of students. For example, poor-performing students may decide to work or increase their hours to prepare themselves for a premature transit from study to the labour market. In such cases, any relationship estimated would spuriously overestimate the impacts of combining work and study. Analysis of the data (table A1 in appendix) indicates that, while the average hours of work do not vary greatly throughout the duration of a course, there is an increase in the rate of work with years in study, especially for courses that stretch beyond two years (mostly higher education courses). To deal with the changing rate of employment over time, we choose to examine the effect of the average hours of work performed per week over

[7] Ideally, we would examine the effect of work and study combinations across all courses undertaken. In such an approach, multiple courses would be treated as repeated observations for the same individual and estimation could be carried out using panel data models, such as random effects estimation, which allows for correlation between observations from the same individual over time. However, such a technique could not be employed in this case because there are too few individuals with repeated observations, especially for higher education students. Therefore, the results presented on the effects of combining work and study may not be representative of the effects for all VET students aged 25 and under. It is possible that the effects may be different for those who are in subsequent courses, for example, because they have a stronger attachment to subsequent courses.

the duration of study on course completion.[8] This treatment captures the combined effect of working hours and the duration of work.

Student jobs

In terms of work and study combinations (table 2), for the first tertiary course undertaken after leaving school it is clear that VET is more likely than higher education to be undertaken part-time (35% versus 13%).[9] Around half of part-time VET and higher education students are employed full-time (32 hours or more) in their first course. For full-time study, 37% of VET students undertake the course without working, compared with 23% for higher education students. Ignoring differences in the rates of work for full-time students, for first-time courses, there are only minor differences in the relative frequencies of work and study combinations between VET and higher education.

Table 2 Work and study combinations in the year in which the first tertiary course ended

	VET						Higher education					
	Full-time		Part-time		Total		Full-time		Part-time		Total	
	Count	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*
Not working	349	37	58	15	407	31	945	23	41	8	986	22
0.1–8 hrs	114	12	11	3	125	10	631	16	20	4	651	14
8.1–16 hrs	215	23	29	8	244	19	1179	29	60	12	1239	27
16.1–24 hrs	122	13	33	9	155	12	637	16	69	14	706	16
24.1–32 hrs	72	8	47	13	119	9	358	9	84	17	442	10
32.1–40 hrs	53	6	139	37	192	15	209	5	140	28	349	8
>40 hrs	12	1	59	16	71	5	91	2	82	17	173	4
Total	**937**	**100**	**376**	**100**	**1313**	**100**	**4050**	**100**	**496**	**100**	**4546**	**100**

Source: LSAY 1995 and 1998 cohorts.

As discussed above, a key challenge in examining student outcomes from combining work and study is that, in many cases, student jobs are career jobs that were obtained prior to study. Students who have already found a job desired as a career before they enter study are likely to have different incentives for completing education and have an advantage in securing post-study employment. Using LSAY, we identified those individuals who reported to have had a job as a career in the year before commencing a spell of study and who had the same job in the year in which they ended their course (including those who changed to another job desired as a career while studying). Also identified are those who had a career job in the last year of study, but who *did not* have a career job in the year prior to commencing study. It may be assumed that these individuals found a career job during the course of their study and the job may be attributed as a benefit of undertaking the course. Data for the last year of study in the first tertiary course and all subsequent courses are presented in table 3.

[8] Average hours worked in all periods of the course, including periods in which the student reported not being in work.

[9] The rate of part-time study for our sample is below the average for all VET enrolments reported by the National Centre for Vocational Education Research (NCVER 2009). NCVER reports that, in 2002, 84% of all students aged between 15 and 24 are enrolled part-time. After consulting with NCVER, it is concluded that direct comparisons between the NCVER part-time study proportions and the proportions estimated from LSAY are not possible. In the NCVER data, part-time students are those whose scheduled course hours are below 75% of the normal full-time study load of 720 hours per year (540 hours per year). However, the scheduled hours of study is based upon a standard measure of the hours required to deliver given course modules, which in reality may differ significantly from institution to institution and may not represent the actual hours delivered. Part-time study in LSAY is self-reported and may better reflect the actual VET student study load. However, it is unclear how students identify themselves as part-time or full-time and whether they do it in a consistent way.

Table 3 Whether or not job in the year in which the first tertiary course ended was a career job

	VET						Higher education					
	Full-time		Part-time		Total		Full-time		Part-time		Total	
	Count	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*
Doesn't have a career job	500	84	187	58	687	75	2731	87	294	64	3025	84
Had a job as a career before study	22	4	45	14	67	7	49	2	12	3	61	2
Started career job while studying	73	12	88	28	161	18	362	12	152	33	514	14
Total	**595**	**100**	**320**	**100**	**915**	**100**	**3142**	**100**	**458**	**100**	**3600**	**100**

Source: LSAY 1995 and 1998 cohorts.

As expected, part-time VET students are much more likely to have found a job as a career before undertaking their first course of study. For the first tertiary course undertaken, around 14% of part-time VET students already had a job as a career before commencing study, compared with 3% of part-time higher education students. Part-time students are also much more likely than full-time students to have found a job they would like as a career while studying. Around one-third of part-time higher education students and 28% of part-time VET students report to have found a job they would like as a career while studying, compared with 12% for both VET and higher education students studying full-time.

While the information in table 3 identifies whether students report that their job is one they would like as a career, tables 4 and 5 present information on the types of jobs students perform across fields of study (see box 1 for a description of how the occupation categories were derived). An important point from tables 4 and 5 is that, in general, jobs performed are more strongly related to the fields of study than the course type (VET or higher education). For students undertaking their first tertiary course, around 60% of both VET and higher education students are employed in clerical, sales or services jobs in their last year before ending study.

While most students work in jobs unrelated to their field of study, those employed in professional jobs (management; science and engineering; business and information technology; health; education; and arts) are more likely to be students undertaking courses in the related fields of education than not. For a given field of study, there are differences in occupations between the two groups, which are likely to be related to differences in the types of education and training and, hence, differences in the types of jobs the two groups are likely to perform post-study. A clear demonstration of this is the difference in jobs performed by VET and higher education students who undertook courses in the information technology and engineering fields of study. Around 34% of VET students who did courses in the information technology field and 37% of VET students who did courses in the engineering field were employed in production jobs (especially intermediate production), compared with 17% and 16% of higher education students from these fields. Instead of working in production, higher education students from these fields were more likely to be employed as professionals.

Box 1 Deriving occupation categories in LSAY

Occupation data in LSAY is coded using three different job classifications: Australian Standard Classification of Occupations (ASCO), first edition; ASCO, second edition; and Australian and New Zealand Standard Classification of Occupations (ANZSCO), first edition. For the purpose of this report, occupation classifications were produced at the ASCO second edition 2-digit level using ABS concordance (ABS 1997, 2006). Matching the ASCO first edition and ANZSCO first edition to the ASCO second edition was done using 6-digit level concordance. However, because the data available from LSAY are only available at the 4-digit level, there is no perfect fit between each of the occupations across the three classification types. Therefore, a considerable amount of judgment and trial and error was required to match the occupations at the 2-digit level. This problem was particularly problematic for converting ASCO first edition classifications (first five waves of the 1995 cohort) to the ASCO second edition. To test the validity of the match for the ASCO first edition, we compared the frequency of the matched 2-digit categories for wave 5 of the 1995 cohort with the frequency of the 2-digit ASCO second edition categories for wave 6 of the 1995 cohort. We found some significant discrepancies, especially between the intermediate and elementary workers, which are most likely to be related to problems with the match than year-on-year compositional changes. For the purposes of comparing types of jobs performed by VET and higher education students, we judged the discrepancies to be benign.

Table 4 Occupation for those whose first tertiary course was VET

	Occupation											
	Man.	Sci. & Eng.	Bus. & IT	Health	Educ.	Arts	Cleric.	Service	Sales	Lab. & prod.	Other	Count
	%	%	%	%	%	%	%	%	%	%	%	
Field of education												
Nat. & phys. sci.	0	3	0	3	3	7	3	17	30	30	3	30
Info. tech.	1	3	12	0	0	5	16	7	20	34	3	76
Eng. & rel. tech.	5	12	7	0	2	0	5	2	21	37	9	43
Arch. & bld.	9	5	0	5	0	0	5	0	18	41	18	22
Agr. env. & rel.	3	3	0	0	0	3	6	22	16	41	6	32
Health	2	0	1	2	0	3	9	39	29	13	2	94
Education	0	0	0	0	17	0	0	67	17	0	0	6
Man. & com.	5	0	7	0	0	3	21	14	34	13	2	238
Soc. & cult.	4	0	1	1	1	13	6	18	36	16	4	117
Arts	5	0	0	0	4	6	5	16	36	23	5	110
Hosp. & pers. serv.	5	0	2	0	0	0	5	43	30	10	5	86
Mixed	13	0	0	0	0	0	13	25	50	0	0	8
Count	37	10	32	5	9	40	94	170	263	168	34	862

Note: Man = Manager and administrator, generalist manager, specialist manager, farmer and farm manager, managing supervisors; Sci. & eng. = Science, building and engineering professionals and associate professionals; Bus. & IT = Business and information professionals and associate professionals; Health = Health and welfare professionals and associate professionals; Ed. = Education professionals; Arts = Social, arts and miscellaneous professionals and associate professionals; Cleric. = Secretaries and personal assistants, other advanced, intermediate and elementary clerical workers; Service = Intermediate and elementary service workers; Sales = Intermediate and elementary sales and related workers; Lab. & prod. = Intermediate plant and machine operators, transport workers and other intermediate production and transport workers; Other = Mechanical, fabrication, automotive, electrical, construction and other tradespeople and skilled agricultural workers and other associate professionals.

Source: LSAY 1995 and 1998 cohorts.

Table 5 Occupation for those whose first tertiary course was higher education

	Occupation											
	Man.	Sci. & eng.	Bus. & IT	Health	Educ.	Arts	Cleric.	Service	Sales	Lab. & prod.	Other	Count
	%	%	%	%	%	%	%	%	%	%	%	
Field of education												
Nat. & phys. sci.	5	5	3	0	6	7	8	15	34	14	2	433
Info. tech.	6	3	19	0	6	3	15	7	21	17	4	184
Eng. & rel. tech.	4	19	10	0	4	2	5	14	22	16	4	195
Arch. & bld.	8	17	6	0	0	10	10	14	22	10	3	63
Agr. env. & rel.	3	9	0	0	2	2	8	11	20	38	9	66
Health	3	1	1	3	2	5	6	36	32	10	1	474
Education	5	1	1	0	6	3	6	28	37	12	1	268
Man. & com.	6	0	18	0	2	4	16	14	30	9	1	658
Soc. & cult	6	1	4	0	4	6	15	19	34	9	2	813
Arts	6	1	4	0	4	8	10	20	30	15	3	344
Hosp. & pers. serv.	5	0	0	0	5	7	17	15	27	22	2	41
Mixed	100	0	0	0	0	0	0	0	0	0	0	1
Count	188	101	244	18	136	182	396	686	1088	427	74	3540

Source: LSAY 1995 and 1998 cohorts.

Course outcomes

A key focus of this study is the relationship between work and study combinations and study outcomes. Course outcomes are observed in the survey after students cease study in a particular course (up to 12 months after completion).[10] These outcomes are completed study, deferred or withdrew (table 6). Defining completion is considered a difficult concept for VET students because many undertake a VET course simply to complete a course module and not to attain a qualification (McMillan, Rothman & Wernert 2005). In some waves in LSAY we can identify whether on enrolment an individual was working towards the completion of a course or had enrolled simply to complete a module. From the data, fewer than 30 courses were identified as being studied to complete a module, which is uncommon. Given that there are too few observations to enable module completion to be considered an outcome alongside course completion, these courses were removed from the sample.

From a policy perspective, we are most interested in whether pressure from work affects course completion because, if it does, there may be considerable waste of education resources. A complication is in how to treat the significant number of deferrals; moreover, whether deferrals should be treated in the same way as withdrawals (table 6). In this study, a deferral is identified when someone commences study, but gives the reason for stopping as deferral. An individual who enrols, but defers without commencing study, is treated as not being in study. Given this definition, the only difference between deferral and withdrawal in this study is that the former may recommence the same course at a later date, while the latter will not. Therefore, for all intents and purposes, if an individual defers and does not recommence the course, the outcome is the same as withdrawal. In LSAY, we can only identify whether someone recommenced their deferred course in the survey following deferral and we can only identify whether an individual who ends their study with a deferral returns in the following year (13% are identified to recommence in the following year). There is insufficient information in LSAY to identify whether those who return to study after the year following deferral are recommencing their deferred course or are beginning a new course.

[10] In the case where study is begun and completed between periods, enrolment and course outcomes are observed in the same survey.

Without full information on the rates in which deferred students recommence, we treat deferral as a separate category from withdrawal.

In terms of completion rates, we observe only small differences between VET and higher education students, but relatively large differences between full-time and part-time students for both groups (table 6). Around 77% of full-time VET students undertaking their first tertiary course are estimated to complete compared with 63% of part-time students. Similarly, around 81% of full-time higher education students undertaking their first tertiary course are estimated to complete compared with 66% for part-time students. Lower completion rates among part-time students may be because they are more likely to combine study and work and are more likely to work longer hours in their jobs (table 3), which may impinge upon their ability to complete study. Alternatively, it may mean that part-time students are less committed to completing their course.

To some degree, completion rates in our sample may be overestimated. First, in some waves of LSAY we could not determine whether an individual had been enrolled in between waves of the survey because respondents were only asked whether they are currently in study and whether they had obtained a qualification since the last interview. In these waves, individuals who enrolled and dropped out of their course in between waves would not be in the analysis. Second, the high and non-random respondent attrition rate in LSAY, especially among those from low socioeconomic backgrounds (McKenzie 2002), means that those who are vulnerable to non-completion are underrepresented. These factors apply to both VET and higher education students and it is difficult to judge whether the bias may be more apparent for one group over the other. To the extent that lower socioeconomic students are more highly represented in VET, attrition may lead to a greater overestimate of VET completion.

When interpreting results, it is also important to keep in mind that our sample is not representative of all VET students aged 15–25 years in their first tertiary course. Module completers (who only enrol in a course subject) are not identified in every wave of LSAY and are excluded from the analysis.[11] As well, we exclude those studying VET as part of an apprenticeship or traineeship. VET students in our sample are mostly 'higher-end' qualifications: diploma students (53%), and certificate level III and IV (29%) (table A2).

From table 7, the relationship between hours of work and completion rates appears to be mixed. For full-time higher education and VET students, there appears to be no clear relationship between work and completion. Generally speaking, the relationship for part-time VET and higher education students is similar—those who work are more likely to complete than those who don't, but the rate of completion tends to decline with the hours worked, especially for VET students. The decline in completion rates with the hours of work for part-time students, especially for VET students, is possibly because those who study part-time and work full-time may already have career jobs and are less motivated to complete relative to those who are not working in career jobs (table 3).

Table 6 Outcomes of first tertiary course

	VET						Higher education					
	Full-time		Part-time		Total		Full-time		Part-time		Total	
	Count	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*
Completed	713	77	231	63	944	73	3277	81	324	66	3601	79
Withdrew	150	16	95	26	245	19	355	9	66	13	421	9
Deferred	58	6	41	11	99	8	433	11	100	20	533	12
Total	**921**	**100**	**367**	**100**	**1288**	**100**	**4065**	**100**	**490**	**100**	**4555**	**100**

Source: LSAY 1995 and 1998 cohorts.

[11] Therefore, caution should be exercised when comparing the VET completion rates reported here to those reported for youth elsewhere, such as in Stanwick (2005), which does not exclude module completers.

Table 7 Completion rates of first tertiary course by hours of work in the year before ending study

	VET			Higher education			
	Full-time	Part-time	Total	Full-time	Part-time	Total	Count
	%	%	%	%	%	%	
Not working	79	59	76	79	50	78	1371
0.1–8 hrs	75	67	74	86	84	86	768
8.1–16 hrs	78	70	77	82	66	81	1472
16.1–24 hrs	75	72	75	77	67	76	853
24.1–32 hrs	77	69	74	78	64	75	553
32.1–40 hrs	78	59	64	79	71	76	537
>40 hrs	67	65	65	76	63	70	241
Count	914	365	1279	4029	487	4516	5795

Source: LSAY 1995 and 1998 cohorts.

The statistics presented in Table 8 do not support this hypothesis and there appears to be no evidence that working in a career job while studying has a negative effect on completion rates. Contrary to expectations, the statistics in table 8 suggest that, for both VET and higher education students, holding a career job may marginally increase the chances of completion relative to those who did not hold a career job while studying. All things being equal, this suggests that students who hold a career job while studying may be more committed to completion because they are more certain of the skill requirements of their future job. However, caution should be exercised because we cannot discount the possibility that the higher completion rates are because those who already have a career job are the best students. This issue will be addressed using multivariate analysis.

In summary, from the descriptive statistics presented above, it may be concluded that the impact of working on course outcomes is mixed. In general, there appears to be no clear relationship between working and student outcomes for full-time students. For part-time students, there is some evidence that working does improve the chances of completing, but only up to a point. We find no evidence that working in a career job before ending study reduces the chances of completion. However, these conclusions must be tempered because they do not control for differences in the personal characteristics and situations of various work and study combinations that may affect completion rates. For example, it is possible that students who choose to work full-time and study part-time are less committed to their course than students who study full-time and work part-time. We attempt to control for such differences in the multivariate analysis.

Table 8 Found a career job before end of first tertiary course

	VET						Higher education					
	Full-time		Part-time		Total		Full-time		Part-time		Total	
	Count	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*
No career job												
Completed	639	77	144	61	783	74	2932	80	205	63	3137	79
Withdrew	139	17	69	29	208	20	334	9	51	16	385	10
Deferred	50	6	23	10	73	7	388	11	71	22	459	12
Total	**828**	**100**	**236**	**100**	**1064**	**100**	**3654**	**100**	**327**	**100**	**3981**	**100**
Found a career job before end of course												
Completed	74	80	87	66	161	72	345	84	119	73	464	81
Withdrew	11	12	26	20	37	17	21	5	15	9	36	6
Deferred	8	9	18	14	26	12	45	11	29	18	74	13
Total	**93**	**100**	**131**	**100**	**224**	**100**	**411**	**100**	**163**	**100**	**574**	**100**

Source: LSAY 1995 and 1998 cohorts.

Post-study employment outcomes

The second focus of this study is on examining employment outcomes from work and study in the first three years after ceasing study. We limit testing for employment benefits to the first three years after study because sample attrition and response truncation (especially for higher education students) means that extending the survey would increase the rate of missing information. Taking a longer-term view is considered important because it is likely that post-study employment benefits from combining work and study diminish over time.

We categorise a job in the last year of study as:

1 one that the individual would like as a career, but is only a casual job

2 one that the individual would like as a career and is an ongoing job (not casual)

3 one that the individual would like as a career and was commenced prior to starting study

4 one that an individual would not like as a career.

We separate these types of jobs to try and identify the possible short-term employment benefits of working while studying. It is assumed that the short-term employment outcomes of those who work in a career job they started prior to study (3) and those who found ongoing employment in a career job while studying (2) are not comparable with outcomes of other students who work, because it is not clear whether their post-study employment outcomes are due to work while studying. Therefore, we assume that the employment benefits of combining work and study can only be identified by comparing the post-study employment outcomes of those who worked in a casual career job or a non-career job against the outcomes of those who did not work. We assume that the benefits of working in a casual career job may be linked to the development of job-specific and general skills, whereas the employment benefits of those working in non-career jobs are more related to general skills. In the case of those not working in career jobs, we speculate that employment benefits from generating general skills by working in the last year of study will depend on whether or not they had prior employment experience. We test this hypothesis by interacting years of employment prior to study with the variable identifying those working in a non-career job. As well as information on the type of job, we include controls for the hours worked on average in a week and the years of work experience prior to starting the last spell of study.

Descriptive statistics on employment outcomes in the first three years after the last year of study are presented in table 9. For both groups of students, there appear to be benefits in working in the last year of study, with the share of former students in employment, in the short- and longer-term, higher than for those who were not employed in the last year of study. Benefits of combining work and study also seem to be higher for those who were employed in casual career jobs rather than in non-career jobs, especially for higher education students.

Table 9 Employment outcomes in the first three years after ending the final spell of study

	1st year			2nd year			3rd year		
	Not working	Emp. p-t.	Emp. f-t.	Not working	Emp. p-t.	Emp. f-t.	Not working	Emp. p-t.	Emp. f-t.
	%	%	%	%	%	%	%	%	%
VET students									
Worked in a casual career job	6	18	76	2	21	77	3	20	77
Worked in a non-career job	7	34	59	8	26	66	9	21	70
Didn't work	37	26	38	23	29	48	21	24	55
Count	176	323	598	98	210	492	72	127	380
Higher education students									
Worked in a casual career job	4	14	82	3	9	88	4	11	85
Worked in a non-career job	10	35	55	5	18	76	6	15	79
Didn't work	27	21	52	14	16	70	12	15	73
Count	501	1144	2146	204	498	2203	138	297	1557

Note: Emp. P-t. = employed part-time (up to 35 hours per week); Emp. F-t. = employed full-time (more than 35 hours per week).
Source: LSAY 1995 and 1998 cohorts.

Modelling approach

The modelling approach adopted in this study is composed of three parts. The first examines the choice of work and study combinations; the second is academic outcomes from combining work and study; and the third examines the employment benefits from combining work and study.

Modelling the choice of study and work combinations

To examine the relationship between individual and course characteristics on the choice of study and work combination, we use a multinomial logit (MNL) model. We choose a MNL model because of its flexibility—we can analyse all work and study combinations together in one model and the estimated coefficients are free to vary across work and study combinations. Alternative models, such as tobit models, place serious restrictions on the choice of work and study combinations. First, such models cannot be used to represent the joint choice of course load and hours of work. Instead, they must assume that the choice of hours in work is conditional on the choice of course load (that is, estimate separate models of hours worked for those who study full-time and part-time), which is not realistic and may bias the results. Second, these models place restrictions on the model coefficients; that is, the estimated sign and significance of coefficients in both the decision to work and decision of hours to work are the same.

Under the MNL model, students in higher education and VET are assumed to choose from a discrete number of study and work combinations rather than making sequential decisions: for example, choosing to study part-time and then choosing work hours. Individuals are assumed to assess the benefits and costs (current and future) of each alternative and choose the one that maximises their usefulness or satisfaction. Benefits from working while studying may include increased income while studying and increased likelihood of finding post-study employment. Costs may include foregone time socialising and studying, which may in turn affect the chances of completing study and future income.

Potentially there is an infinite number of possible work and study combinations. However, in practice, youth are likely to choose from only a small number of combinations, although the number of choices available may vary between students, depending on individual time constraints. For the purpose of this study, we assume that all young people choose between five alternatives:

1 Full-time study, no work

2 Full-time study, work up to 16 hours per week (approximately two days per week)

3 Full-time study, work more than two days per week

4 Part-time study and work up to 32 hours per week (approximately four days per week)

5 Part-time study and work more than 32 hours per week (full-time employment).

These alternatives are chosen because they broadly represent some of the most common combinations and also give us enough observations under each category to estimate robust

results.[12] We omit students who are enrolled part-time and who are not working because it is an uncommon combination and there are insufficient observations to allow for estimation of robust results for such a category. Alternative 2 can be considered to include mainly full-time students whose study schedule may not be seriously affected by work—they can comfortably fit their work around their study by working on weekends or outside contact hours. We assume that working more than two days a week while studying full-time may impinge upon study time (alternative 3). For part-time work, which is generally between 25% and 75% of full-time loads, we assume that work for more than four days a week may impinge on study time.

A feature of the MNL model, compared with other multi-category models such as the ordered probit, is that each of the study and work alternatives has a separate equation, so that the effect of explanatory variables is allowed to vary across the work and study combinations. However, an important drawback of using an MNL model is that it invokes the independence from irrelevant alternatives (IIA) assumption, which states that the ratio of the probabilities of choosing any two alternatives is independent of the attributes of any other alternative in the choice set (Debreu 1960). In a nutshell, this means that the MNL model assumes that the degree of substitutability between each of the alternatives is the same or that the categories are not ordered.

The explanatory variables to be included in this model reflect possible costs and benefits that individuals may receive from various levels of participation. These include:

- ✧ characteristics of the individual, such as their age, gender, size of the city they lived in at the start of the survey
- ✧ characteristics of the individual's course, such as field of education and qualification type
- ✧ characteristics of the individual's parents, such as past employment status, education levels and occupation, whether they help pay tuition fees, which may reflect the socioeconomic status of parents
- ✧ parental wealth and income, proxied by their post-school qualifications, employment while students are in school and using the ANU3 scale of the status of both parents' occupations[13]
- ✧ whether a student receives income support through Youth Allowance to study
- ✧ academic ability, proxied by their university entry scores
- ✧ living arrangements, such as whether or not they are still living at home
- ✧ other commitments, such as whether or not they have children.

A point of note is that we do not include the amount of Youth Allowance in the model because it is highly likely to be endogenous; that is, simultaneously determined with the choice of work and study combination. A limitation of LSAY is that we cannot identify an individual's place of residence while they were studying, only their location when they joined the survey in Year 9. Therefore, we cannot examine specific impacts on students from rural areas, but we can examine more generally the impacts of students living away from home.

A limitation of using the multinomial logit approach is that the same variables must be included for each of the equations. This means that we cannot examine how employer characteristics may affect the choice of hours worked because such information is not observed for those individuals who choose not to work. For some variables of interest, such as field of study, while there are observations for each of the work and study combinations, there are insufficient numbers of

[12] The MNL model estimates separate coefficients for each work and study combination, which means that we need a large number of observations for each alternative. When examining education outcomes, work and study combinations are an independent variable, which enables us to examine impacts for more combinations.

[13] The ANU3 scale is a measure of occupational status that reflects differences in occupational bargaining power, prestige and rewards (McMillan & Jones 2000).

observations for some categories, which makes estimation problematic. Such variables were not included in the analysis.

Modelling education outcomes

In this study, we analyse the impacts of combining work and study by examining the impacts of average hours of work during study on three student outcomes—withdrawal, deferment and completion. Given that these three outcomes are ordered—that is, they represent three outcomes along a scale of academic achievement—we estimate the impacts of combining work and study using an ordered probit model.

We estimate models for part-time students and full-time students separately to try to adjust for the effects that different academic workloads may have on students' ability to manage work and study. All else being equal, working three days a week might have negligible impacts on the academic outcomes of part-time students, but the impacts of such hours are likely to be more negative for full-time students. Further, we split the two groups to control for unobserved differences between part- and full-time students, which may also affect completion rates. These may include differences in the perceived employment benefits from completing, differences in individuals' circumstances (such as whether they have other pressing commitments; for example, family commitments) and differences in personality traits, such as motivation and persistence. To further control for the academic demands of a course, we include information on the field of education and type of course.

The ordered probit model, an extension of the binary probit model, is based on the assumption that there exists an underlying index function—in this report, an underlying index of academic performance that can be mapped to the three academic outcomes. We assume that the underlying index depends upon a range of individual and employment characteristics. Individual characteristics to be included in the model include past educational performance, proxied by the Interstate Transfer Index, which is a standardised index of university entry scores.[14] Year 9 numeracy and literacy scores as well as a combined index were trialled in the model instead of using the Interstate Transfer Index, but none was significant. Other personal characteristics include employment history, socioeconomic status and employment status of parents, age, gender, marital status, presence of dependent children, whether or not the student had a break from study before enrolling in their first tertiary course and state of residence. Employment information includes work history, tenure of employment, occupation and hours of work.

Because part-time and full-time students have different patterns of work hours, we include different levels of commitment in each. For part-time students, hours of work are categorised as part-time (working up to 32 hours a week) and full-time (more than 32 hours of work a week). For full-time students, hours of work are none, up to eight hours per week (approximately one day), 8.1 to 16 hours per week (between one and two days), 16.1 to 24 hours per week (between two and three days) and more than 24 hours per week (more than three days per week). These levels were chosen because they are common combinations, which are the same combinations used in the model of work and study choices. There are also enough observations under each category to give robust results. As for the modelling of work and study choices, we omit those who study part-time and do not work. There are few of these individuals and they are more likely to be working part-time due to circumstances that are unrelated to the circumstances of other part-time students; for example, because of possible health conditions.

[14] In some years of the survey, information is available for the Queensland Overall Position (OP), but not recorded for the Transfer Index. To convert the Queensland OPs into Transfer Index values, we used conversion factors provided by the Queensland Tertiary Admissions Centre. Because there are a number of missing observations for this variable, we include a dummy variable to control for potential bias from the missing data. Observations may be missing if an individual could not recall their score, or if they did not receive an entry score.

As well as estimating an ordered probit model of student outcomes, we estimate a bivariate ordered probit model of hours worked and student outcomes on a pooled sample of full-time students to test for self-selection on unobservables that may bias the results. As discussed above, a possible issue when modelling the effect of working while studying on student outcomes is controlling for possible self-selection on unobserved factors, such as student performance and attachment to the course, which may be correlated with both hours of work and outcomes. A bivariate ordered probit model involves estimating an ordered probit model of hours worked and an ordered probit model of student outcomes jointly, with self-selection bias controlled for by allowing the error terms from these two equations to be correlated. To identify this model, we include a number of identification restrictions that are assumed to affect hours of work, but not student outcomes, including population of the place of residence (but not where the education occurs) and whether each parent is a manager. It is assumed that having a parent as a manager is an important pathway for employment while in study, but after controlling for socio-demographics of parents, it does not affect outcomes from study.

Modelling employment benefits from combining work and study

As discussed above, we examine not only short-run employment benefits from combining work and study, but also benefits up to three years after completion. Other potential labour market benefits of work and study, such as job satisfaction and wage progression, are not examined here.

To estimate the longer-term benefits of employment, we estimate a random effects ordered panel probit model, using the first three waves of data after the last course undertaken in the LSAY dataset. The three outcomes modelled are: not employed (coded 0), employed part-time (coded 1) and employed full-time (coded 2). We use an ordered model of employment outcomes rather than a binary model of employment (employed or not) because it gives us more information about the actual outcomes from combining work and study. Because a binary employment model does not distinguish between full-time and part-time study, it is likely that it would tend to overestimate the employment benefits from combining work and study: it is possible that, while looking for work, those who completed study may continue to work in their non-career job.

The variables included in the model are those that relate to the characteristics of employment, such as hours worked, type of job and whether the individual had prior work experience. We also include factors such as marital status and the presence of children, and socioeconomic background, which may affect both the choice of working hours while studying and post-study employment outcomes. To test how the employment outcomes from combining work and study vary through time, we interact a variable identifying years after study with the above job types while studying. Because we are only interested in the outcomes for a given year and not the path that individuals follow from year to year, we do not estimate a dynamic model (which includes a lagged dependent variable as an explanatory variable).

We estimate the employment model of post-study outcomes for VET and higher education students, which allows us to test for differences between outcomes for VET and higher education students.

Results

Results from the multivariate models estimated in this report are average marginal effects and represent the estimated average (across the sample) percentage-point change in the probability of the outcome or dependent variable for a one-unit change in each of the explanatory variables, independent of the effects of all other explanatory variables in the model. For categorical variables, the marginal effects represent the percentage-point change in the probability of a given outcome, relative to the reference category that is omitted. In most cases, we report a t-statistic for each marginal effect. A t-statistic indicates the precision of the estimate and can be interpreted as a test of the confidence with which we can state that a marginal effect is different from zero. Although it is customary to check if a t-statistic is higher than 1.96, which is the value representing a 5% level of significance, it is good to remember that the higher the t-statistic, the more precise is our estimate. In other cases we refrain from reporting the t-statistic to save space, but instead just report the level of significance as either 5% or 10%.

Choice of work and study combinations

Results from the multinomial logit model of work and study combinations for first-time tertiary students are presented in table 10. In this context, the marginal effects represent the percentage-point change in the probability of choosing a specified work-study combination, given a one-unit change in an explanatory variable, all else being equal. For example, from table 10 we can say that those who are studying a VET qualification are eight percentage points more likely to study full-time with no employment than higher education students (reference category). Because these combinations represent an exhaustive set (after excluding those who work part-time and do not work), the sum of the marginal effects across the five combinations is zero. In other words, if increasing the level of an independent variable increases the likelihood of choosing four of the combinations, it must reduce the probability of choosing the remaining combination.

A clear result from table 10 is that VET and higher education students prefer different work and study combinations. Generally speaking, the results show that young people undertaking VET are more likely than higher education students to study full-time without working, which may be because VET courses are typically shorter and hence there is a lesser need to supplement their income. However, when combining work and study, VET students are more likely to study part-time than higher education students, who are more likely study full-time. The higher rate of VET students combining part-time study and work rather than full-time study and work may be because of the more flexible ways in which VET students may undertake training, which gives them greater scope for part-time study and work combinations.

Table 10 Marginal effects for choice of work and study combination for first tertiary course

	Full-time student						Part-time student			
	No work		Up to 2 days p.w.		More than 2 days p.w.		Up to 4 days p.w.		More than 4 days p.w.	
	m.e.	*t-stat*	*m.e.*	*t-stat*	*m.e.*	*t-stat*	*m.e.*	*t-stat*	*m.e.*	*t-stat*
Constant	0.09	1.45	-0.32	-4.33**	0.19	2.77**	0.02	0.70	0.03	1.44
1995 cohort	-0.02	-1.39	0.02	1.61	0.02	1.50	-0.01	-2.56**	-0.01	-3.21**
Female	-0.08	-6.46**	0.07	4.78**	0.02	1.26	0.00	0.53	-0.01	-2.96**
Married or de facto	-0.04	-1.43	-0.02	-0.52	0.02	0.63	0.02	1.43	0.02	3.73**
Place of birth (ref: born in Australia)										
Born in other English speaking country	-0.03	-0.72	0.05	1.19	-0.01	-0.33	0.00	0.27	-0.01	-1.11
Born in non-English speaking country	0.10	5.17**	0.01	0.46	-0.08	-3.25**	-0.01	-1.35	-0.02	-2.41**
Age (ref: less than 18 years old)										
18–20 years old	-0.04	-1.49	0.03	0.80	0.02	0.58	0.00	0.06	-0.01	-1.04
21–23 years old	-0.07	-2.96**	0.02	0.65	0.00	-0.02	0.03	2.16**	0.03	3.58**
Older than 23	0.01	0.18	-0.09	-1.46	-0.06	-0.99	0.08	5.00**	0.06	5.22**
University entry score (ITI x 0.1)[1]	0.00	0.37	0.03	5.00**	-0.02	-3.49**	-0.01	-3.41**	0.00	-3.66**
University entry score missing	0.07	1.97**	0.14	2.98**	-0.16	-3.67**	-0.03	-1.66	-0.03	-2.96**
Live with parents	-0.10	-5.09**	0.16	6.75**	-0.03	-1.75*	-0.01	-1.33	-0.02	-3.70**
State of residence in initial survey (ref: NSW)										
Victoria	-0.02	-1.15	0.03	1.67	0.02	1.06	-0.01	-1.48	-0.02	-3.83**
Queensland	0.00	-0.03	-0.06	-2.73**	0.05	2.68**	0.00	0.36	0.00	0.71
Western Australia	-0.01	-0.68	0.00	-0.06	0.01	0.50	0.00	0.22	0.00	0.35
South Australia	0.03	1.54	-0.04	-1.70*	0.00	-0.03	0.01	1.14	0.00	0.11
Tasmania	0.07	2.36**	0.01	0.15	-0.05	-1.33	-0.02	-1.27	-0.01	-0.60
ACT and NT	0.01	0.40	-0.03	-0.84	0.01	0.42	0.00	0.21	0.00	0.15
Population of place of residence (ref: More than 100 000)										
1000–9900	0.05	2.89**	-0.01	-0.38	-0.04	-2.28**	0.00	-0.15	0.00	0.87
Less than 1000	0.06	3.68**	-0.01	-0.68	-0.05	-2.40**	0.00	-0.28	0.00	0.31
Enrolled in a VET course	0.08	4.23**	-0.07	-2.91**	-0.08	-3.88**	0.03	3.75**	0.04	7.24**
Receives Youth Allowance	0.13	6.55**	0.22	8.49**	-0.15	-6.17**	-0.10	-7.60**	-0.11	-9.03**
Father's highest post-school qualification (ref: none)										
Certificate	-0.05	-3.09**	0.03	1.58	0.02	0.92	0.00	0.40	0.00	0.42
Higher education	0.00	-0.15	0.04	1.71*	-0.03	-1.66	-0.01	-0.80	0.01	1.13
Unknown	-0.03	-0.97	0.04	1.26	-0.03	-0.95	0.01	0.93	0.00	0.42
Father is employed	-0.01	-0.56	0.00	0.11	0.02	0.54	-0.01	-0.88	0.00	0.46
Father is a manager	0.00	-0.01	-0.04	-2.12**	0.03	1.82*	0.00	0.62	0.00	0.95
Father's ANU3 occupation score	0.00	-0.53	0.00	0.92	0.00	-0.08	0.00	0.62	0.00	-2.46**
Mother's highest post-school qualification (ref: none)										
Certificate	0.02	1.03	-0.03	-1.29	0.01	0.45	0.00	0.02	0.00	-0.08
Higher education	0.00	0.07	-0.01	-0.74	0.02	1.09	0.00	0.36	-0.01	-1.85*
Unknown	0.04	1.58	-0.02	-0.66	-0.01	-0.18	0.00	-0.19	-0.01	-1.51
Mother is employed	-0.04	-2.23**	0.01	0.59	0.04	1.92*	-0.01	-1.53	0.00	-0.08
Mother is a manager	0.01	0.35	-0.06	-1.76*	0.05	1.71*	-0.01	-0.79	0.01	1.36
Mother's ANU3 occupation score	0.00	0.29	0.00	0.43	0.00	-1.28	0.00	0.99	0.00	0.54
Youth Allowance x Live with parents	0.07	2.63**	-0.07	-2.10**	-0.05	-1.72*	0.03	1.67	0.03	1.47
Sample size	5660									

Notes: ** Significant at 5%; *Significant at 10%.

1 Missing university entry scores are replaced with combined Year 9 mathematics and numeracy scores scaled to between 0 and 1.

Irrespective of the type of study, those with a higher university entry score—obviously a measure of academic ability—have a preference for working full-time up to two days per week. For example, all else being equal, those who have an Interstate Transfer Index of 75% are estimated to be 15 percentage points more likely to work full-time up to two days work per week than someone with an index of 25% and approximately ten percentage points less likely to be employed part-time. These results suggest that part-time students may be less academically inclined than their full-time counterparts. However, we should point out that the distribution of entry scores between the two groups is quite different and it is difficult to conclude whether the effect of past academic achievement is consistent for VET and higher education students.[15]

Age is a strong predictor of the likelihood of part-time enrolment, with those who re-engage in education at a later age much more likely to choose the part-time study option. Relative to those who re-engage before 18, those who re-engage at age 23 or older are around eight percentage points more likely to be enrolled part-time and working up to four hours per week and six percentage points more likely to be enrolled part-time and working more than four hours. The greater popularity of part-time work among older students is probably because they already have employment and are less inclined to forego income and their standard of living for full-time study.

An important finding from the results is that the choice of work and study combination does not appear to be strongly linked to the socioeconomic status of parents. All else being equal, if working while studying was closely linked to the family's financial resources, we may expect that those from lower socioeconomic backgrounds would be less likely to be enrolled full-time and not working. However, results from table 10 show that parents' working status, occupation status (measured by the ANU3 scores) and tertiary qualifications are not strongly related to choice of work and study combination. This result is consistent with findings from analysis reported by the House of Representatives Standing Committee on Education and Training (2009), which found that rather than work for financial need, school students tend to work for financial independence and to support their lifestyle. Results do suggest, however, that students whose parents are managers are more likely to be studying full-time and work more than two days per week. Cultural factors appear to play a role in the choice of work and study combination, with children born in non-English speaking countries around ten percentage points more likely to be enrolled full-time without work compared with Australian-born students.

After controlling for the socioeconomic status of parents, students who receive Youth Allowance are much more likely to be in full-time study and spend less time in work. However, we find that the effect of receiving Youth Allowance on the probability of working while in full-time study is greater for those who live at home than for those who live away because they are likely to have fewer financial needs. For those living at home, receiving Youth Allowance is estimated to increase the chances of being in full-time study and not working by 20 percentage points compared with 13 percentage points for those living away from home. While this may suggest that Youth Allowance reduces the incentive to work, to some extent the relationship may work the other way, those who prefer to work more than two days a week are not eligible for Youth Allowance.

Finally, the choice of work and study combination is also affected by local employment opportunities. Those from rural (population of more than 1000 but fewer than 100 000) and remote areas (population fewer than 1000) are five percentage points and six percentage points more likely to be studying full-time without work than students from urban areas (population over 100 000).

[15] We attempted to include interaction effects to test for this, but possibly because of high multi-colinearity among the interaction terms, the model would not converge.

Student outcomes

To understand how combining work and study affects student outcomes, we estimate univariate ordered probit models of the first tertiary course outcomes for part-time and full-time students separately. If we had pooled the data for the full-time and part-time students, it would be difficult to estimate the effect of work because there are likely to be considerable differences in the academic requirements between part and full-time students. The results are presented as marginal effects, or the change in the probability of each of the three outcomes (withdraw, defer and complete) for a one-unit change in an explanatory variable. Because the student outcomes are exhaustive, the sum of the marginal effects for a given explanatory variable is zero.[16]

From the highly significant estimated threshold parameters (μ's) in each of the sets of results in table 11, it can be concluded that student outcomes are clearly ordered. That is, they represent different points along a scale of academic achievement, which means that an ordered model is appropriate. When interpreting these results, it is important to keep in mind the small sample sizes for part-time students, which means that the estimated results for part-time students are less precise (and thus few significant results for part-time students). In cases where the marginal effects are large, but insignificant, there may be reason to investigate the result further.

Table 11 Marginal effects of student outcomes, all first-time tertiary courses

	Full-time study			Part-time study		
	withdrew	deferred	completed	withdrew	deferred	completed
1995 cohort	-0.003	-0.003	0.006	-0.041**	-0.030**	0.070**
Has children	0.191***	0.094***	-0.286***	-0.012	-0.009	0.020
Female	-0.025***	-0.022***	0.046***	-0.028	-0.020	0.048
Live with parents	-0.004	-0.004	0.008	-0.018	-0.013	0.031
Married or de facto	-0.021	-0.021	0.042	-0.042	-0.035	0.078
Place of birth (ref: born in Australia)						
Born in other English speaking country	-0.017*	-0.017*	0.034*	-0.083**	-0.084**	0.167**
Born in non-English speaking country	0.042**	0.033**	-0.075**	-0.022	-0.018	0.040
ANU occupation socioeconomic of father (1–10)	-0.002	-0.002	0.003	-0.002	-0.002	0.004
ANU occupation socioeconomic of mother (1–10)	0.000	0.000	0.000	0.006	0.004	-0.010
Age (ref: less than 18)						
18–20	0.023*	0.02*	-0.043*	0.096**	0.061**	-0.157**
21–23	-0.073***	-0.064***	0.137***	-0.067	-0.048	0.115
Older than 23	-0.054***	-0.065***	0.119***	-0.019	-0.015	0.034
State of residence in initial survey (ref: NSW)						
Victoria	0.011	0.01	-0.021	0.004	0.003	-0.007
Queensland	0.012	0.01	-0.022	0.054	0.035	-0.088
Western Australia	-0.005	-0.005	0.01	0.028	0.019	-0.047
South Australia	0.008	0.007	-0.015	0.026	0.018	-0.044
Tasmania	-0.003	-0.003	0.005	0.020	0.014	-0.033
ACT and NT	0.041***	0.032***	-0.073***	0.103**	0.057**	-0.159**
University entry score (ITI x 0.1)[1]	-0.192***	-0.172***	0.364***	-0.204***	-0.120***	0.325***
University entry score missing	0.010	0.010	-0.020	0.029	0.016	0.045
Enrolled in a VET course	-0.048***	-0.05***	0.098***	-0.059**	-0.045**	0.104**

[16] Where they do not, the discrepancy is due to rounding error.

	Full-time study			Part-time study		
	withdrew	deferred	completed	withdrew	deferred	completed
Field of study (ref: education)						
Unknown	-0.049**	-0.057**	0.107**	-0.136	-0.183	0.319
Nat. & phys. sciences	0.025	0.021	-0.046	-0.041	-0.035	0.077
Information technology	0.041**	0.032**	-0.073**	-0.013	-0.010	0.023
Engineering	0.054***	0.041***	-0.094***	-0.043	-0.037	0.080
Architecture & building	0.044	0.034	-0.078	0.052	0.032	-0.084
Agric., environ. & related	0.002	0.001	-0.003	-0.069	-0.067	0.135
Heath	-0.014	-0.013	0.027	-0.016	-0.012	0.028
Management & commerce	0.006	0.005	-0.011	-0.022	-0.016	0.038
Society & culture	0.034**	0.029**	-0.063**	0.024	0.016	-0.040
Arts	0.029*	0.024*	-0.054*	-0.014	-0.011	0.025
Other fields of study	0.009	0.008	-0.016	-0.033	-0.027	0.060
Completed school	-0.014	-0.012	0.027	-0.045	-0.029	0.074
Started study more than a year after school	0.027**	0.022**	-0.049**	0.027	0.019	-0.046
Start time missing	-0.028**	-0.029**	0.057**	0.051	0.032	-0.083
Employment characteristics in last year of study						
Job would like as a career (ref: not a career job)						
Career job found before study	0.044	0.034	-0.078	0.032	0.021	-0.053
Career job found while studying	-0.019**	-0.019**	0.038**	-0.057***	-0.045***	0.102***
Years worked in current job	-0.005**	-0.005**	0.010**	-0.016**	-0.012**	0.029**
Years of past employment	-0.013***	-0.012***	0.025***	-0.007	-0.005	0.012
Average hours worked during course						
Full-time study (ref: no work while studying)						
Up to 8 hours	0.000	0.000	-0.001	-	-	-
8.1–16 hours	0.024**	0.021**	-0.046**	-	-	-
16.1–24 hours	0.043***	0.035***	-0.079***	-	-	-
More than 24 hours	0.084***	0.059***	-0.143***	-	-	-
Part-time study (ref: work up to 32 hours per week)						
Work more than 32 hours				0.070***	0.047***	-0.117***
μ	0.51**			0.628***		
Sample size	4931			853		

Notes: ***Significant at 1%; **Significant at 5%; *Significant at 10%.

1 Missing university entry scores are replaced by combined Year 9 mathematics and numeracy scores that are scaled to between 0 and 1.

A key result from table 11 is that, after controlling for a range of differences between VET and higher education students—including academic ability (measured by university entry score or combined Year 9 numeracy and literacy scores if entry scores are missing), course type and field of study—full-time and part-time VET students are both around ten percentage points more likely to complete than their higher education counterparts. The higher completion rates among VET students may be due to a number of reasons, including the shorter duration of the courses, differences in academic demands and differences in the flexibility and modes of course delivery. In general, the modularised nature of VET means that courses can be better tailored to individual training needs and are delivered in a greater range of modes, especially off-campus delivery modes.

For full-time students, we find that those who work beyond eight hours (roughly one working day) a week on average over the course of their study are less likely to complete than those who do not work at all while studying. Full-time students who work for between eight and 16 hours a week (roughly two working days) on average over the course of their study are estimated to be around five percentage points less likely to complete compared with those who do not work at all. At the

extreme, full-time students who work more than 24 hours a week (roughly more than three days) are estimated to be around 14 percentage points less likely to complete compared with those who do not work at all. For part-time students, due to the small number of observations, the only comparison is between those who work fewer than 32 hours per week (part-time workers) and those who work more than 32 hours (full-time workers).[17] We estimate that part-time students who work more than 32 hours per week are around 12 percentage points less likely to complete than those who work less than 32 hours per week.

From models with interaction effects (table 12) we find that, after controlling for differences between VET and higher education students, there is no evidence that working while studying full-time affects VET and higher education students differently. An exception is that VET students who work up to eight hours a week are estimated to complete at an 11-percentage point lower rate than higher education students. From analysis of the data, it appears that this result is driven by lower completion rates among diploma/advanced diploma health students who report working up to eight hours a week and may reflect the effect of work placements that are often associated with these courses. However, there is insufficient information in LSAY to identify whether the work is part of a placement. From the positive and significant interaction effect in table 12, we can conclude that part-time VET students who work full-time (work more than 32 hours per week on average over their course) are around 15 percentage points more likely to complete than part-time higher education students who work full-time. To complete a qualification part-time while working full-time requires considerable effort and application and the longer duration of higher education courses may make the required commitment more taxing. The relatively long commitment required to obtain a higher education qualification part-time may also mean that employers may be less likely to support full-time employees who choose this education pathway.

Table 12 Key interactions between VET and hours of work in first tertiary courses

	Full-time			Part-time		
	withdrew	deferred	completed	withdrew	deferred	completed
Studying for a VET qualification	-0.054	-0.058	0.112***	-0.025	-0.019	0.044
Average hours worked during course						
Full-time study (ref: no work while studying)						
Up to 8 hours	-0.009	-0.008	0.016	-	-	-
8.1–16 hours	0.021	0.019	-0.039*	-	-	-
16.1–24 hours	0.038	0.031	-0.069***	-	-	-
More than 24 hours	0.097	0.066	-0.163***	-	-	-
Part-time study (ref: work up to 32 hours per week)						
Work more than 32 hours				0.128	0.079	-0.206***
Study type and work interactions						
VET x FT Work up to 8 hours	0.064	0.047	-0.111**	-	-	-
VET x FT Work 8.1–16 hours	0.015	0.013	-0.029	-	-	-
VET x FT Work 16.1–24 hours	0.028	0.023	-0.050	-	-	-
VET x FT Work more than 24 hours	-0.023	-0.023	0.046	-	-	-
VET x PT Work more than 32 hours	-	-	-	-0.080	-0.072	0.152***

Notes: ***Significant at 1%; **Significant at 5%; *Significant at 10%.

It is estimated that the effect of work depends on the nature of the job. Those who find a career job while studying are more likely to complete than those who work in a non-career job. Those who find a career job while studying are mostly finding work in professional jobs, especially in information technology, engineering, and architecture and building. Because professional jobs tend to require the

[17] The few students who study part-time and who do not work are omitted from the study because their number is too small to warrant detailed analysis and their circumstances are likely to be quite different from the typical part-time student.

attainment of a qualification for post-study employment, students who find work in these areas may have an added incentive to complete. Further, their employers may provide them with support, such as favourable work arrangements, to help them to attain their qualification. Although we control for academic ability in the form of university entry scores (or combined Year 9 numeracy and literacy scores if entry scores are missing), we cannot rule out the possibility that those who find career jobs while studying are better-performing students, who are more likely to complete.

In contrast, we find evidence that those who continue to work in a career job that was held prior to study (including those who change to another job while studying) are less likely to complete than those who worked in a non-career job. Full-time and part-time students who continue working in a career job they had prior to study are estimated to be around eight and five percentage points respectively less likely to complete than those working in a non-career job. There may be a number of factors combining to produce this result. First, those who continue working in a career job while studying may only intend to complete the parts of the course relevant to their job. Second, those working in career jobs may not have the same incentives to complete as those who do not work in a career job. However, both of these estimated effects are just outside the 10% level of significance, most likely because of the small number of students aged 15–24 with career jobs found prior to study.

A consistent result for part- and full-time students is that the longer an individual has been in the job, the greater the chance of completion. A possible explanation is that the more established an individual is in the job, the more support they get from their employer in the form of more flexible working hours or possibly time off work, in the case of full-time employees. For full-time students, the more years of employment experience, the greater the chance of completion. There may be two possible reasons for this. On the one hand, employment history, including history in the same job, may help develop a range of 'soft skills' such as time management, commitment to completing a task, communication and interpersonal skills, as well as confidence, which may help academic performance. On the other hand, the relationship may not be causal, but instead related to uncontrolled differences in the characteristics of students who have and have not a history of working; for example, differences in motivation. Using interaction terms, we found no evidence that the effect of work and study combinations while studying was related to employment history.

To test the robustness of the effect of average hours in work during study, we estimated a range of alternative models. First, to test for evidence of self-selection bias, we extended the univariate ordered probit model (results discussed above) to a bivariate ordered probit model. Under this model, we control for the effect of possible unobserved factors that affect both education outcomes and hours of work, such as attachment to course. Results from this model using different exclusion restrictions, including region and parents' socioeconomic status, failed to show any significant evidence of self-selection on unobservables.[18] As a further test of the adequacy of observed controls, we omitted hours of work and re-estimated the model. If there existed unobserved factors that were correlated with both hours of work and completion, then we would expect omitting hours of work would significantly affect the results, especially for factors that are correlated with hours of work, such as past academic performance and type and field of study. However, omitting hours of work made little difference to the results, including on the estimated coefficients for past academic performance and type and field of study. This further supports the results from the bivariate probit model.

We also find that treating the outcome variable as a three-category outcome rather than a binary outcome (study ended with a qualification or not) has very little bearing on the results, with estimated marginal effects of completion for a binary probit model comparable with those reported in table 11. Finally, we tested how choosing the hours worked in the last period of study, instead of

[18] Exclusion restrictions are factors that affect hours of work, but not the likelihood of completion. Valid exclusion restrictions are important for the identification of the model. Both of these factors were found to be significant in the choice of work hours, but were not significant in the completion model.

average hours worked while in study, would affect the results for full-time students in table 11. We found that using the same categories of work hours (none, up to eight hours, 8.1–16 hours, 16.1–24 hours and more than 24 hours) but from the last period of study considerably increases the estimated negative relationship between hours of work and the chances of completion, especially for the lower hour categories. To the extent that students who studied for more than one period and who commenced work after their first year of study may have already had a reduced chance of completion before starting work, using work in the last period of study may overestimate the impacts of combining work and study on course completion.

Employment outcomes

For the purposes of this section, we present predicted post-study probabilities of full-time employment for those who combined study and those who did not (table 13) (complete results from the employment model are presented in table A3 in the appendix). The predicted full-time employment probabilities are calculated for an individual with average characteristics, except for their past employment status. To calculate the employment probability for those who worked while studying, it is assumed that between 8.1 and 16 hours are worked per week. When estimating predicted probabilities for those who had work experience prior to studying, we assume that they had only one year of prior employment experience. The standard errors (and hence the level of significance) of the marginal effects are estimated using the delta method.

Table 13 Predicted probabilities of full-time employment in the first three years after ending study

	VET			Higher education			Difference in ME		
	1st year	2nd year	3rd year	1st year	2nd year	3rd year	1st year	2nd year	3rd year
Had not had prior work experience									
Didn't work in last year of study (reference case)	0.23	0.72	0.82	0.11	0.86	0.92	-	-	-
Worked in a non-career job in last year of study	0.82	0.99	0.99	0.27	0.95	0.99	-	-	-
Marginal effect of working while studying	0.58***	0.26***	0.18***	0.16***	0.09***	0.07**	0.42***	0.17***	0.11***
Had prior work experience									
Didn't work in last year of study (reference case)	0.18	0.78	0.86	0.08	0.90	0.94	-	-	-
Worked in a non-career job in last year of study	0.83	0.99	0.99	0.32	0.96	1.00	-	-	-
Worked in a casual career job in the last year of study	0.86	0.88	0.88	0.81	0.97	0.95	-	-	-
Marginal effect of working in non-career job while studying	0.65***	0.20***	0.13***	0.25***	0.06**	0.05**	0.40***	0.14***	0.08***
Marginal effect of working in a casual career job while studying	0.68***	0.10**	0.01	0.74***	0.07**	0.00	-0.06**	0.03**	0.01
Effect of prior work experience for those who worked in a non-career job	0.01	0.00	0.00	0.05**	0.01	0.01	-0.04**	-0.00	-0.00

Notes: ***Significant at 1%; **Significant at 5%; *Significant at 10%; ME = marginal effects.

Predictions are made for an individual with average characteristics except for their work history and work while studying. For individuals who worked while studying, predictions are made assuming that they worked between 8.1 and 16 hours per week. The significance of the marginal effects is calculated by deriving standard errors of the estimates using the delta method.

From table 13, we can conclude that those who work in the last year of study are much more likely to be in full-time employment in the first year after ceasing study than those who did not work while studying. In the first year out from study, on average, VET students who worked in a casual career job in their last year of study are estimated to be 68 percentage points more likely to be in full-time employment in their first year out compared with those who did not work in their last

year.[19] Similarly, higher education students who worked in casual career jobs are estimated to be 74 percentage points more likely to be in full-time employment in their first year out compared with those who did not work in their last year. The high initial full-time employment benefits of working in a casual career job are likely to be because students continue to work in these jobs in the year after studying, which may not be the case for students who work in jobs that are not career jobs, especially higher education students.

The initial full-time employment benefits for higher education students who worked in a non-career job in their last year of study is only around a third of that for those who worked in a casual career job (25-percentage point increase in the full-time employment probability compared with 74-percentage point increase). For VET students, there is only a three-percentage point lower full-time employment benefit from working in a non-career job instead of a casual career job. The reason for the difference in the initial benefits from working in non-career jobs between VET and higher education students is difficult to pinpoint. A possible explanation is that employers of higher education graduates may not value general skills to the same degree as employers of VET graduates, possibly because general skills may not be as important in performing job tasks. Another explanation is that employers of higher education graduates value general skills just as highly, but consider course completion as a better measure of these than working while studying. Finally, although they report that they do not want the job as a career, by comparison with higher education students, VET students may be more likely to derive job-specific skills that are recognised by employers from a non-career job. However, we cannot rule out the possibility that there are unobserved factors, such as personal traits, that affect both their decision to work in the last year of study and also their post-study employment prospects. To the extent that such factors are present, the post-study employment benefits of working while studying will be overestimated to some degree.

An important finding is that, although the employment benefits of working in a non-career job decline over time, they are still significant up to three years after ending study. Compared with those who did not work in the last year of study, VET students who worked in a non-career job are 13 percentage points more likely to be in full-time employment and higher education students are five percentage points more likely. The longer-term full-time employment benefit of working in non-career jobs in the last year of study suggests that, not only does combining work and study help students find full-time employment, but it also helps them stay in full-time employment, by sorting them into suitable jobs and developing their skills. In contrast, despite having higher initial full-time employment benefits, the employment benefits of working in a casual career job in the last year of study diminish after the second year for both VET and higher education students. The rapid tapering-off of full-time employment benefits for those who worked in casual career jobs in the last year of study may be because they do not move to ongoing employment and hence are more likely to lose their jobs.

Finally, we find that work experience prior to the last year of study makes little difference to post-study employment chances for those who worked in a casual non-career job in their last year of study. The estimated initial post-study employment probability of higher education students working in casual non-career jobs in their last year of study is estimated to be five percentage points higher if they have a record of prior work experience. However, this effect disappears after the first year out from study. For VET students, prior work experience makes no significant difference to employment.

[19] Predicted probability of employment in the first year out given that the student worked in a casual career job in their last year of study (86%) less the predicted probability of employment in the first year out given that the student did not work in the last year of study.

Conclusions

The objective of this study was to examine the factors affecting tertiary student choice of work and study combinations and the effect of such choices on student and study outcomes. A particular focus was on trying to identify differences in the choices and outcomes between VET and higher education students. Such information is important in being able to design well-targeted measures for supporting students while in study.

Consistent with the findings of the House of Representatives Standing Committee on Education and Training (2009), which focused on the implications of working while at school, we find little evidence that the financial and human resources of parents affect the work and study combinations of students. However, we note that the analysis is on tertiary courses that were mostly undertaken prior to 2006 and we cannot rule out the possibility that rising costs of living may make this result redundant. In particular, if the availability and amount of Youth Allowance has not risen to take into account the rise in the costs of study (including living costs), then the estimated effect of Youth Allowance in reducing the need and hours worked by youth may be overstated in this report.

Estimated outcomes in this report from combining work and study highlight both the costs and benefits of this practice. On the cost side, depending on the hours worked, results show that students who work while studying may be less likely to complete than those who do not. For full-time students, the negative impacts of work on completion kicks in beyond eight hours of work (roughly a day) per week on average. For part-time students, full-time work is estimated to significantly reduce the chances of completion relative to part-time work. We find no evidence that these results are biased by self-selection into hours of work—where the choice of hours of work and completion are affected by unobservable variables, such as attachment to course. The estimated negative education outcomes are robust to a range of assumptions.

In terms of benefits, results presented in this study suggest that working while studying is more than a signal of motivation that assists students to find work; it also provides them with skills that help maintain them in employment. We find that working in the last year of study improves the chances of students finding full-time employment, up to three years after ceasing study. For VET students, unlike for higher education students, the post-study employment benefits are *not* strongly linked to having worked in a job that may be directly relevant to their career. Possible explanations for this include employers of higher education graduates not valuing general skills to the same degree as employers of VET graduates, possibly because general skills may not be as important in performing job tasks. Or, although they do not want the job as a career, VET students, by comparison with higher education students, may be more likely to derive job-specific skills that are recognised by employers.

For policy-makers, results from this study demonstrate the possible positive and negative affects from measures of income support. On the one hand, income support may reduce the need to work, which will help completion and post-study employment outcomes. On the other hand, income support, by reducing hours of work, may limit opportunities for developing general and job-specific labour market skills. As well as being cognisant of these potential trade-offs, policy-makers should attempt to reduce any influence of work hours on the likelihood of study completion; for example, by enticing providers to offer more flexible modes of education. Another possibility, which arises from findings from this study, is to assist students in finding work that better matches their intended post-study career.

Analysis presented in this study shows that those who find a job they would like as a career are more likely to complete study than those who work in jobs that they do not want as a career.[20] Working in a career job may provide added incentives for students to complete because this experience may help them to better understand the importance of course material in performing jobs that they would like as a career and/or give them an extra incentive to complete to obtain ongoing employment. One way to achieve such an outcome would be for governments to support campus brokerage services to link education providers to suitable employers.

[20] Although we control for academic ability in the form of university entry scores (or combined Year 9 numeracy and literacy scores if entry scores are missing), we cannot rule out the possibility that those who find career jobs while studying are better-performing students who are more likely to complete.

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Appendix

Table A1 Employment rates and hours of work during higher education students' first tertiary course

Length of study spell	Year of spell	Number count	Employed %	Avg. hours worked per week
One year	1	523	74	19
Two years	1	967	69	17
	2	972	78	18
Three years	1	1353	67	15
	2	1358	76	17
	3	1352	79	19
Four years	1	1058	64	15
	2	1069	74	16
	3	1067	79	18
	4	1066	79	19
Five years	1	621	65	16
	2	629	72	17
	3	630	79	19
	4	628	82	20
	5	628	80	19

Source: LSAY 1995 and 1998 cohorts.

Table A2 Level of VET qualification studied for those aged 15–25 whose first tertiary course is a VET course

AQF qualification	%
Certificate I–II	11
Certificate III–IV	29
Certificate unknown[1]	7
Diploma and advanced diploma	53
Count (N)	1313

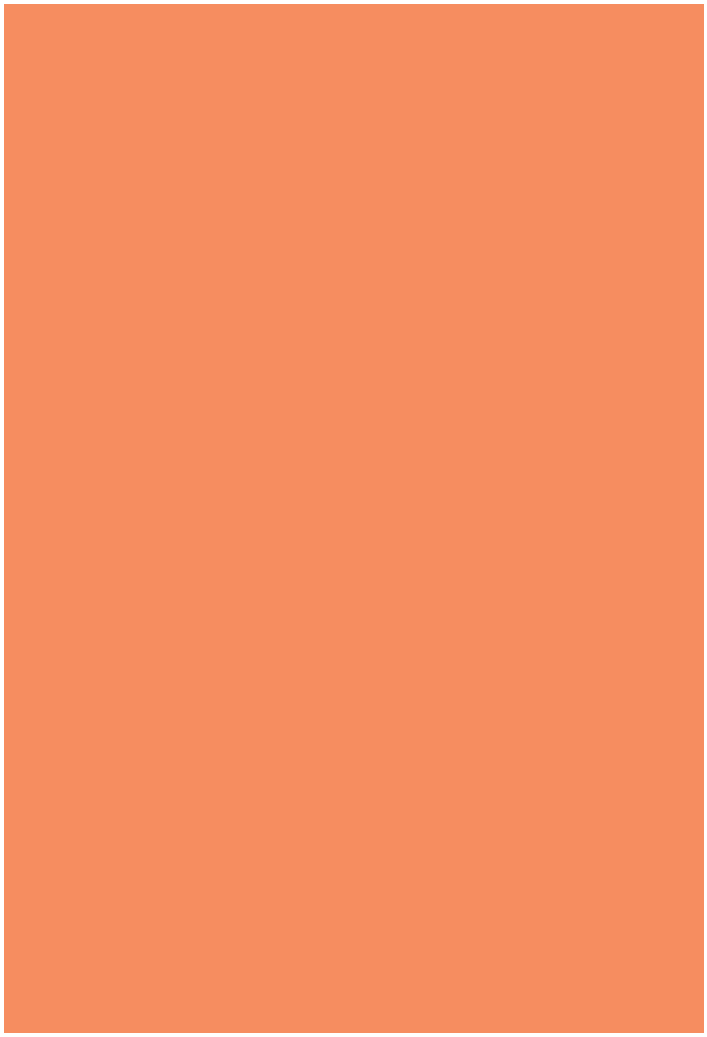
Note: 1 Non-response or respondent could not recall the level of the certificate

Table A3 Coefficients for the ordered probit model of post-study employment outcomes

	coeff.	t-stat.
Constant|	2.01	4.46**
1995 cohort	-0.17	-1.57
Time period (ref: 1996–99)		
2000–01	-0.42	-1.53
2000–03	-0.52	-2.75***
2000–05	-0.49	-3.28***
2000–07	0.20	1.47
Has children	-2.78	-16.08***
Has a disability	-0.85	-3.37***
Female	-0.11	-1.61
Married or de facto	0.01	0.14
State of residence in initial survey (ref: NSW)		
Victoria	-0.10	-1.03
Queensland	-0.28	-2.53***
Western Australia	-0.04	-0.36
South Australia	-0.18	-1.49
Tasmania	-0.31	-1.83*
ACT and NT	0.00	-0.01
Place of residence (ref: city/town with more than 100 000 residents)		
Less than 100 000 residents	-0.18	-2.01**
Less than 10 000 residents	-0.17	-1.76*
Numeracy and literacy score (1–10)	0.14	2.14**
Age (ref: less than 18)		
1–20	-0.11	-0.55
2–23	-0.06	-0.35
Older than 23	-0.01	-0.03
Receives Youth Allowance	-0.10	-1.27
Live with parents	-0.61	-8.38***
Father's highest qualification (ref: no post-school qualification)		
Trade certificate	-0.01	-0.06
Higher education	-0.18	-1.70*
Unknown	-0.16	-1.04
Father employed	0.12	0.73
ANU scale of father's occupation	-0.18	-1.03
Father is a manager	0.25	2.49**
Mother's highest qualification (ref: no post-school qualification)		
Trade certificate	0.04	0.37
Higher education	-0.11	-1.11
Unknown	-0.06	-0.40
Mother employed	0.13	1.23
ANU scale of mother's occupation	-0.05	-0.30
Mother is a manager	0.12	0.70
Field of study (ref: education)		
Science	-0.34	-0.68
IT	-0.86	-1.44
Engineering	0.24	0.35
Architecture	1.86	0.87
Agriculture	-1.29	-1.77*
Health	-1.00	-2.54**
Management and commerce	0.05	0.15

	coeff.	t-stat.
Hospitality	-1.35	-1.68
Social studies and arts	-0.87	-2.69***
Highest qualification (no post-school qualification)		
VET	0.03	0.23
Bachelor	0.15	1.43
Higher education	0.51	3.08***
Hours worked in last year of study (ref: did not work)		
0.1–16	0.04	0.30
16.1– 24	0.06	0.47
24.1–32	0.11	0.72
More than 32	1.01	7.03***
Year since leaving education (ref: first)		
second	1.33	11.20***
third	1.63	11.50***
Type of job in last year of study (ref: did not work)		
Work in career job found prior to study	0.74	2.80***
Work in casual career job found while studying	1.57	4.45***
Work in ongoing career job found while studying	1.29	5.29***
Work in a non-career job	1.59	6.63***
Interactions		
Work in career job found prior to study x Year 2	-0.55	-1.44
Work in career job found prior to study x Year 3	-1.10	-2.72***
Work in casual career job found while studying x2	-1.20	-1.97**
Work in casual career job found while studying x3	-1.54	-2.94***
Work in career job found prior to study x 2	-0.76	-2.00**
Work in career job found prior to study x 3	-1.39	-3.76***
Work in a non-career job x 2	-0.83	-2.97***
Work in a non-career job x 3	-1.25	-3.76***
Years of prior employment	0.19	7.12***
Years of prior employment x Work in non-career job	-0.13	-2.10**
Years of prior employment x Work in non-career job x Year 2	-0.06	-0.78
Years of prior employment x Work in non-career job x Year 3	0.05	0.40
Higher education x Work in casual career job	-0.68	-1.67*
Higher education x Work in casual career job x Year 2	0.86	1.16
Higher education x Work in casual career job x Year 3	0.62	0.90
Higher education x non-career job	-1.50	-5.85***
Higher education x non-career job x Year 2	0.92	3.00***
Higher education x non-career job x Year 3	1.41	3.86***
Higher education x Years of prior employment	0.09	1.46
Higher education x Years of prior employment x Year 2	0.05	0.59
Higher education x Years of prior employment x Year 3	-0.06	-0.45
μ	2.10	47.59***
σ	1.39	23.55***

Notes: ***Significant at 1%; **Significant at 5%; *Significant at 10%.



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