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Abstract

This paper examines the impact of macroeconomic conditions on the education and employment outcomes of youths in school-to-work transition. The dataset is based on five different cohorts from the Youth in Transition surveys (YIT) and the Longitudinal Surveys of Australian Youth (LSAY) and covers the period from 1985 to 2006, which is long enough to control explicitly for both poor and positive macroeconomic conditions. The multivariate analyses show that both the unemployment rates, and to a lesser extent economic growth rates, have an impact on youths' education and employment outcomes. Although the effects vary significantly by gender and education level, overall the results reveal that poor macroeconomic conditions tend to drive young people out of full-time work and into inactivity or part-time work. In addition, poor macroeconomic conditions tend to discourage further education. A result worth noticing is that males who did not complete secondary school suffer the largest increase in unemployment risks as the unemployment rate increases.

1. Introduction

This study examines the effects of macroeconomic conditions on the education-employment outcomes of youths in school-to-work transition by combining the Youth in Transition surveys (YIT) and the Longitudinal Surveys of Australian Youth (LSAY). Unlike the existing studies focusing either on employment or on education, this study investigates jointly the education and work decisions. This is achieved by combining work and education decisions in a multinomial logit specification. The aim is to reflect the close relationship between both decisions, with combining or switching between study and work a common practice among youths. This paper also contributes to the existing literature in the following aspects. Firstly, the analysis is carried out on data collected from 1985 to 2006, which is a long enough period to control explicitly for both poor and good macroeconomic conditions. Secondly, the macroeconomic data used reflect state differences in GDP growth and state and gender differences in unemployment, thus capturing the particular macroeconomic environment of each young individual. Thirdly, the rich information in the survey data enables human capital endowments, socioeconomic backgrounds and family structure to be controlled for in the model. Cohort effects are also taken into account, as youths in different cohorts potentially faced structurally different social and labour market environments. Finally, because education level is likely to play a major role in school-to-work transitions, the modelling approach allows youths with different levels of education to respond differently to changes in macroeconomic conditions.

The finding that youths entering the labour market face more difficulties in securing employment in periods of high unemployment has been documented in a multi-country study by the OECD (1998) and by Stevens (2007) for Germany. For Australia, analysing data collected between 1980 and 1994, Marks and Fleming (1998) found that young Australians are more sensitive to increases in the unemployment rate than the general population. Moreover, it is argued that unemployment while young have long lasting effects. For example, a recent study by Bell and Blanchflower (2010) finds evidence that “spells of youth unemployment have harmful impacts on a number of outcomes - happiness, job satisfaction, wages and health - many years later.” Assessing how the youth labour market is affected by macroeconomic conditions can provide insights for policy makers, particularly valuable in the context of the current economic downturn.

The paper is structured as follows. Section 2 provides a description of the modelling approach. The data are described in Section 3. The results are discussed in Section 4. Section 5 concludes.

2. The Empirical Strategy

In this study, youths who have left school are classified into seven mutually exclusive categories: 1) working full-time; 2) working full-time and studying; 3) studying and working part-time; 4) studying and not working; 5) working part-time; 6) unemployed and 7) not in the labour force (and not studying).

Jointly considering education and employment decisions provides a better framework to understand school-to-work transitions than a simple framework focusing on either labour market or education outcomes. A multinomial logit model is used, which has the undesirable property to rely on the assumption of independence of irrelevant alternatives (IIA). However, when modelling a dependent variable with seven outcomes, it is computationally intractable to account for the correlations between the outcomes, and it is also practically impossible to find alternative specific variables to identify the extra correlation parameters in the model. The multinomial logit model, which has a closed functional form and can handle a relative large number of categories, is widely employed in modelling discrete multiple choices in the literature. In the model, we control for human capital endowments, socioeconomic backgrounds, cohort effects and the prevailing macroeconomic conditions.

Assume that the indirect utility function for a young individual i having education and labour market status j is given by:

$$U_{ji}^{*} = \alpha_j X_i + \beta_j W_i + \xi_{ji}$$

$$\text{where } j = \begin{cases} 0 & \text{working full-time (and not studying)} \\ 1 & \text{studying and working full-time} \\ 2 & \text{studying and working part-time} \\ 3 & \text{studying and not working} \\ 4 & \text{working part-time (and not studying)} \\ 5 & \text{unemployed (and not studying)} \\ 6 & \text{not in labour force (and not studying)} \end{cases} \qquad (0.1)$$

$$i = 1, \ldots, n.$$

Where, the vector of explanatory variables X_i indicates the cohort, human capital endowments and socioeconomic backgrounds of individual i. The vector W_i reflects the prevailing macroeconomics conditions (GDP growth and unemployment rates) for individual i, and it

also includes interactions with education attainment. α_j and β_j are the corresponding vectors of coefficients for X_i and W_i, respectively, and for each alternative j. The model is estimated separately for males and females by maximum likelihood. The utility associated with the base category (full-time work) is normalised to zero.

3. The Data

3.1 Sample

The analysis is based on data from the Youth in Transition surveys (YIT Cohorts 65, 70 and 75) and the Longitudinal Surveys of Australian Youth (LSAY Cohorts 95 and 98). The YIT Cohorts 65, 70 and 75 surveyed young people born in 1965, 1970 and 1975 respectively. The respondents were surveyed annually from about 14 to 30 years of age, depending on the cohort. LSAY 95 and 98 follow a group of young people who were in Year 9 in 1995 and 1998, respectively.[1] LSAY 95 was discontinued in 2006 while LSAY 98 is still an on-going survey. The focus of this study is on young people who are over 18 and have left secondary school either before or after completing Year 12. Appendix Table A.1 presents the distribution of the sample across the cohorts. All observations from the five cohorts are pooled together to obtain a large sample of youths presenting a maximum of variation in the economic conditions they experienced. The dataset consist of 8,955 males and 10,418 females with total numbers of observations of 43,166 and 53,939, respectively, and cover the period between 1985 and 2006.

3.2 Education and Labour Market Outcomes

The labour force and education status of young people are presented in Table 1 by education level. Studying here only refers to post-secondary study since secondary school students are excluded from the sample. Moreover, note that since all observations are pooled together a young person finishing Year 12 and then going to university would first appear in the Year 12 row before moving to the university row as his or her level of education increases. Therefore, observations in the lowest education levels tend to relate to younger respondents. Bearing this in mind, the table shows that male and female secondary school graduates have a much lower probability of being unemployed than those who have not completed Year 12. Among males, those with an education level below Year 12 are the least likely to study and the most likely to have already entered the labour market. Young females with an education level below Year 12 exhibit a similar pattern, although they are less likely to be working and more likely to be out of the labour force than males. As one would expect, a great proportion of secondary

[1] Most young people in Year 9 are 14 or 15 years of age.

school completers are enrolled in post-secondary education. As this group contains many university students, only a relatively small proportion is working (and not studying) or looking for a job. As expected, the share of people out of the labour force is higher among females than among males and this proportion decreases with the level of education.

Table 1 Education and labour force status by education level and gender (in per cent)

	Studying			Working & not studying				
	Working							
Education	Full-time	Part-time	**Not in the labour force**	Full-time	Part-time	**Unem-ployed**	**Not in the labour force (& not studying)**	**No. of obser-vations**
Males								
Year 11 or less	10.2	1.5	2.0	72.4	4.6	5.1	4.2	8,066
Year 12	11.7	25.7	15.5	37.3	5.5	1.7	2.7	23,364
Certificate	12.7	10.5	8.3	56.7	6.3	2.9	2.7	8,321
University	11.7	10.0	8.1	55.8	8.8	2.0	3.6	3,415
All males	11.6	17.0	11.0	49.1	5.8	2.6	3.1	43,166
Females								
Year 11 or less	5.8	3.1	3.1	49.5	15.1	4.6	18.7	7,286
Year 12	9.5	32.9	13.7	29.4	8.4	1.4	4.8	29,044
Certificate	10.2	13.4	7.8	47.9	11.4	2.9	6.3	11,634
University	10.5	10.3	5.2	58.2	10.5	1.5	3.9	5,975
All females	9.3	22.2	10.0	39.3	10.2	2.2	6.9	53,939

Note: Row percentages sum to 100.

3.3 Explanatory Variables from the Surveys

Individual characteristics controlled for in the model include demographics (age, country of origin, family structure), human capital endowments (current education level, school type, numeracy and literacy), family and socioeconomic backgrounds (sibling, parents' education and employment) and living arrangement. Age, as well as numeracy and literacy, have been decomposed into dummy variables, to allow for non-linearity. All the above variables are dummy indicators, and the means of these variables presented in Appendix Tables A.1 and A.2 reflect the distribution of the observations across each category. Because the dataset is based on five cohorts with overlapping observations over time, for a given age, observations can come from different calendar years. This allows the multivariate analysis to disentangle the effects of age and time-specific economic conditions.

Appendix Tables A.1 and A.2 show that most of the observations in the dataset relate to young people under 23 years of age with a current education level of Year 12. Most young people come from a double-salary household but the proportion of parents with post secondary education is low. As for numeracy and literacy, the quintiles are compiled within each cohort of YIT and LSAY surveys based on the full sample of the particular wave during

which the test was undertaken (that is, in wave 1 for LSAY and at age 14 for YIT). Since this research focuses on young people over 18 years of age who have left secondary school, only a subsample of these cohorts is used here. Therefore, individuals in the dataset are not equally spread over the five quintiles.

3.4 External Explanatory Variables: Macroeconomic Conditions

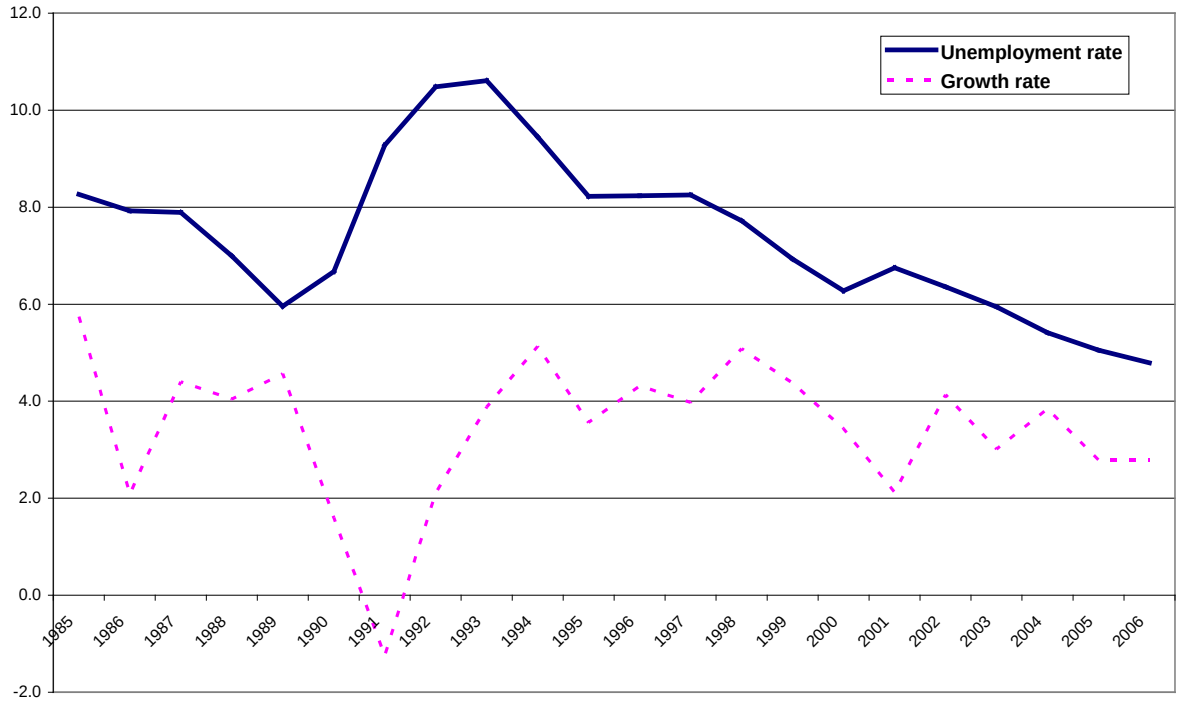
This study focuses on the labour market and education outcomes of young people under different macroeconomic conditions. Macroeconomic conditions are measured by annual Gross Domestic Product (GDP) growth rates and unemployment rates. Annual GDP growth is available at the national level prior to 1991 (ABS 2008a) and by state from 1991 onwards (ABS 2008b). Monthly unemployment rates are available by state and gender for the whole period of analysis (ABS 2008c). These macroeconomic indicators have been linked to the individual-level dataset described above.

The macroeconomic data show that GDP growth rates varied greatly over time and across states between 1991 and 2006. For instance, Queensland and Western Australia have been experiencing economic growth rates much higher than the national average since 2002. As illustrated in Figure 1, there is also great variation in the national unemployment and economic growth rates between 1985 and 2006. During this period the Australian economy experienced one recession and several years of strong economic growth (over four per cent). The 1991-92 recession resulted in high unemployment levels reaching nearly 11 per cent. Unemployment remained high until the mid-1990s, even though strong economic growth occurred between 1993 and 1996. Recent years have been marked by low unemployment and high economic growth. It is beneficial to this study to include periods of strong economic growth associated with both high and low levels of unemployment. This enables the econometric model to distinguish the independent effects of economic growth and unemployment.

Table 2 presents the distribution of young people across the seven education and employment categories by level of state unemployment. The table shows a positive relationship between the proportion of young people being unemployed and state unemployment rates, and the relationship is stronger for males than for females. This is consistent with the Australian study by Marks and Fleming (1998) who find that youth unemployment is sensitive to the national unemployment rate. For females, higher unemployment rates are also associated with higher proportions out of the labour force (and not studying). On the contrary, males tend to stay

unemployed rather than withdrawing from the labour force (and not studying) when unemployment rates are very high (above eight per cent).

Figure 1 National unemployment and economic growth rates (1985-2006, in %)



Source: ABS

Table 2 also reveals a negative relationship between the proportion of young people working and state-level unemployment rates. Moreover, the proportion in study is at its lowest when the unemployment rate is low (below four per cent) for both males and females. When the unemployment rate is between four and eight per cent, young people are more likely to be studying (and not working part-time). However, the proportion studying declines when the unemployment rate is above eight per cent. Presumably, such high levels of unemployment may lead to more uncertainty regarding the return from further education. It might also make it harder for students to find a part-time job to finance their studies.

4. The Results[2]

The multinomial logit model described in Section 2 is estimated to examine the effects of prevailing macroeconomic conditions on youths' education and labour market outcomes controlling for human capital endowments, socioeconomic background, family structure and cohort effects. As most of the individuals in the dataset have multiple observations, a

[2] For the estimated results in Appendix Tables B.1 and B.2, as well as for the associated marginal effects and predicted probabilities in Tables 3, 4, 5 and 6, significance is indicated by *** at the 1 per cent level, ** at the 5 per cent level and * at the 10 per cent level. The corresponding standard errors are in brackets.

clustering method is applied to obtain robust standard errors. The estimated coefficients and associated standard errors are reported in Appendix Tables B.1 and B.2 for males and females, respectively.

Table 2 Education and labour force status by level of state unemployment rate (in per cent)

	Studying			Working & not studying					
	Working		Not in the labour force			Unemployed	Not in the labour force (& not studying)	Total	No. of observations
Unemployment rate	Full-time	Part-time		Full-time	Part-time				
Males									
<4%	9.0	13.6	7.1	59.4	6.2	1.3	3.4	100	2,995
Between 4% and 6%	10.4	18.9	9.9	49.8	5.9	2.0	3.1	100	13,475
Between 6% and 8%	11.6	18.9	11.9	46.3	5.9	2.1	3.4	100	14,401
>8%	13.6	13.5	12.0	48.9	5.4	4.1	2.6	100	12,295
All males	11.6	17.0	11.0	49.1	5.8	2.6	3.1	100	43,166
Females									
<4%	10.6	17.5	8.1	46.0	10.0	1.0	6.8	100	2,914
Between 4% and 6%	9.4	25.5	9.0	39.2	9.8	1.7	5.4	100	19,442
Between 6% and 8%	9.2	22.4	10.5	38.5	10.3	2.2	6.9	100	19,060
>8%	8.9	17.6	11.3	39.0	10.6	3.2	9.4	100	12,523
All females	9.3	22.2	10.0	39.3	10.2	2.2	6.9	100	53,939

The discussion of the results is based on the marginal effects presented in Tables 3 to 6. In particular, the average marginal effects of human capital endowments, socioeconomic backgrounds, family structure and birth cohorts on education and employment choices are reported in Tables 3 and 4 for males and females respectively. They measure the changes in the predicted probabilities associated with a discrete change in each dummy variable while keeping other variables constant.

For GDP growth and unemployment rates, which are continuous variables, the marginal effects are the first derivatives of the probability of being in each category. Because GDP growth and unemployment rates are interacted with education, these marginal effects are computed for each education level. The average marginal effects of macroeconomic conditions and education are reported in Tables 5 and 6 for males and females respectively.

4.1 Human Capital Endowments

Human capital theory suggests that individuals with higher ability are more able to reap the benefit from investment in post-school education. As indicators of academic achievement and ability, test scores are a powerful predictor of university-going behaviour (Hilmer 1998, 2001; Marks and McMillan 2003, 2007). In line with this literature, the results presented in Tables 3 and 4 indicate that higher numeracy and literacy scores increase the probability to be

studying. Moreover, the results reveal that women with higher numeracy and literacy scores and men with higher numeracy scores fare better in the labour market. They are less likely to be unemployed, not in the labour force or in part-time work (and not studying) than their counterparts in the lowest quintiles.

Table 3 Average marginal effects of dummy variables on males' employment and education outcomes (8,955 males with 43,166 observations)

	Studying						
	Working		Not in the labour	**Working and not studying**		**Unem-ployed**	**Not in the labour force (and not studying)**
	Full-time	Part-time	force	Full-time	Part-time		
School type (reference: Government)							
Catholic	0.008	0.045***	0.001	-0.047***	-0.000	-0.006**	-0.001
	(0.006)	(0.006)	(0.005)	(0.009)	(0.004)	(0.002)	(0.002)
Independent	0.007	0.064***	0.021***	-0.078***	-0.002	-0.010***	-0.001
	(0.006)	(0.007)	(0.006)	(0.010)	(0.004)	(0.003)	(0.003)
Reading score (reference: Quintile1)							
Quintile 2	-0.007	0.033***	0.012	-0.022	-0.009*	-0.004	-0.003
	(0.009)	(0.010)	(0.009)	(0.014)	(0.005)	(0.004)	(0.003)
Quintile 3	-0.013	0.039***	0.010	-0.023*	-0.004	-0.005	-0.004
	(0.009)	(0.010)	(0.008)	(0.014)	(0.005)	(0.004)	(0.004)
Quintile 4	-0.011	0.060***	0.020**	-0.054***	-0.006	-0.004	-0.004
	(0.009)	(0.010)	(0.009)	(0.014)	(0.005)	(0.004)	(0.004)
Quintile 5	-0.020**	0.085***	0.025***	-0.084***	0.003	-0.006	-0.003
	(0.009)	(0.010)	(0.008)	(0.014)	(0.006)	(0.004)	(0.004)
Math score (reference: Quintile1)							
Quintile 2	0.009	-0.014	-0.003	0.049***	-0.013*	-0.017***	-0.012**
	(0.008)	(0.012)	(0.010)	(0.015)	(0.007)	(0.005)	(0.005)
Quintile 3	0.017*	0.016	-0.003	0.025*	-0.021***	-0.021***	-0.013***
	(0.009)	(0.012)	(0.009)	(0.015)	(0.007)	(0.005)	(0.005)
Quintile 4	0.020**	0.027**	0.018*	0.002	-0.026***	-0.023***	-0.019***
	(0.009)	(0.012)	(0.009)	(0.015)	(0.007)	(0.005)	(0.005)
Quintile 5	0.024***	0.064***	0.032***	-0.040***	-0.031***	-0.026***	-0.023***
	(0.009)	(0.012)	(0.009)	(0.015)	(0.007)	(0.005)	(0.005)
Age (reference: 18-19)							
20-21	-0.034***	-0.013***	-0.060***	0.118***	0.001	0.004**	-0.017***
	(0.005)	(0.005)	(0.005)	(0.006)	(0.003)	(0.002)	(0.003)
22-23	-0.058***	-0.069***	-0.111***	0.245***	0.003	0.002	-0.012***
	(0.006)	(0.006)	(0.006)	(0.008)	(0.004)	(0.003)	(0.003)
24-25	-0.059***	-0.109***	-0.147***	0.350***	-0.010*	-0.006**	-0.019***
	(0.008)	(0.008)	(0.007)	(0.011)	(0.006)	(0.003)	(0.004)
26-27	-0.063***	-0.125***	-0.152***	0.365***	-0.015**	-0.003	-0.008
	(0.009)	(0.011)	(0.008)	(0.015)	(0.007)	(0.004)	(0.006)
28-30	-0.067***	-0.132***	-0.159***	0.368***	0.004	-0.005	-0.008
	(0.011)	(0.015)	(0.008)	(0.019)	(0.011)	(0.005)	(0.007)
Country-of-origin (reference: Australian born)							
English speaking migrant	-0.010	0.029*	0.004	-0.043**	0.002	0.011*	0.007
	(0.012)	(0.015)	(0.012)	(0.018)	(0.007)	(0.006)	(0.007)
Non-English speaking migrant	-0.022**	0.039***	0.119***	-0.128***	-0.014***	0.008	-0.001
	(0.010)	(0.011)	(0.012)	(0.015)	(0.005)	(0.005)	(0.004)

Table 3 Continued

	Studying						
	Working		Not in the labour force	Working and not studying		Unemployed	Not in the labour force (and not studying)
	Full-time	Part-time		Full-time	Part-time		
Family status (reference: single with no children)							
Couple with no children	0.021**	-0.063***	-0.065***	0.130***	-0.002	-0.010***	-0.012***
	(0.008)	(0.009)	(0.006)	(0.011)	(0.005)	(0.003)	(0.003)
Couple with children	-0.009	-0.047***	-0.060***	0.126***	-0.003	-0.003	-0.004
	(0.009)	(0.013)	(0.008)	(0.014)	(0.007)	(0.004)	(0.005)
Single with children	-0.015*	-0.042***	-0.012	0.080***	-0.012	0.002	-0.001
	(0.008)	(0.014)	(0.009)	(0.015)	(0.008)	(0.005)	(0.007)
Siblings (reference: none)							
One	-0.010	0.019	-0.017	0.026	-0.002	-0.008	-0.008
	(0.012)	(0.012)	(0.012)	(0.017)	(0.007)	(0.005)	(0.005)
Two	-0.008	0.023*	-0.025**	0.023	-0.002	-0.007	-0.004
	(0.012)	(0.012)	(0.012)	(0.017)	(0.007)	(0.005)	(0.005)
Three or more	-0.016	0.014	-0.027**	0.038**	0.000	-0.005	-0.005
	(0.012)	(0.012)	(0.012)	(0.017)	(0.007)	(0.005)	(0.005)
Live with at least one parent	0.001	0.052***	-0.046***	-0.026***	0.017***	0.002	-0.001
	(0.004)	(0.005)	(0.005)	(0.007)	(0.003)	(0.002)	(0.002)
Parents' post-secondary education (reference: None)							
One	0.005	0.033***	0.014***	-0.048***	-0.001	-0.005**	0.004
	(0.005)	(0.006)	(0.005)	(0.008)	(0.003)	(0.002)	(0.003)
Both	0.013**	0.040***	0.013**	-0.063***	0.000	-0.003	-0.001
	(0.006)	(0.007)	(0.006)	(0.010)	(0.004)	(0.003)	(0.003)
Parents' employment status (reference: None)							
One	0.017	0.021	-0.062***	0.060**	-0.015	-0.012*	-0.009
	(0.013)	(0.020)	(0.023)	(0.025)	(0.010)	(0.007)	(0.009)
Both	0.020	0.047**	-0.084***	0.053**	-0.010	-0.015**	-0.011
	(0.012)	(0.020)	(0.022)	(0.024)	(0.010)	(0.007)	(0.009)
Cohort (reference: YIT 65)							
YIT 70	-0.009	0.074***	0.004	-0.046***	-0.012**	0.006	-0.018***
	(0.015)	(0.013)	(0.014)	(0.016)	(0.005)	(0.005)	(0.004)
YIT 75	-0.000	0.081***	-0.031**	-0.074***	0.023***	0.016***	-0.015***
	(0.013)	(0.011)	(0.012)	(0.014)	(0.006)	(0.005)	(0.004)
LSAY 95	-0.090***	0.092***	-0.054***	0.019	0.030***	-0.007*	0.011**
	(0.011)	(0.009)	(0.012)	(0.014)	(0.005)	(0.004)	(0.005)
LSAY 98	-0.115***	0.065***	-0.070***	0.090***	0.025***	-0.004	0.009*
	(0.011)	(0.009)	(0.012)	(0.014)	(0.006)	(0.004)	(0.005)

Table 4 Average marginal effects of dummy variables on females' employment and education outcomes (10,418 females with 53,939 observations)

	Studying			Working and not studying			Not in the labour force (and not studying)
	Working		Not in the labour			Unem-ployed	
	Full-time	Part-time	force	Full-time	Part-time		
School type (reference: Government)							
Catholic	0.009**	0.048***	-0.016***	-0.017**	-0.009**	-0.009***	-0.006*
	(0.004)	(0.006)	(0.004)	(0.007)	(0.004)	(0.002)	(0.003)
Independent	-0.004	0.052***	0.014**	-0.047***	-0.010*	-0.006***	0.002
	(0.005)	(0.007)	(0.005)	(0.009)	(0.005)	(0.002)	(0.005)
Reading score (reference: Quintile1)							
Quintile 2	0.009	0.021*	-0.008	0.013	-0.013*	-0.012***	-0.009
	(0.008)	(0.011)	(0.008)	(0.014)	(0.008)	(0.004)	(0.006)
Quintile 3	0.014*	0.037***	-0.015*	0.004	-0.012	-0.013***	-0.014**
	(0.008)	(0.011)	(0.008)	(0.014)	(0.008)	(0.004)	(0.006)
Quintile 4	0.005	0.054***	-0.014	-0.001	-0.020**	-0.013***	-0.012*
	(0.008)	(0.011)	(0.008)	(0.014)	(0.008)	(0.004)	(0.006)
Quintile 5	0.013*	0.079***	-0.006	-0.030**	-0.024***	-0.016***	-0.016***
	(0.008)	(0.011)	(0.008)	(0.014)	(0.008)	(0.004)	(0.006)
Math score (reference: Quintile1)							
Quintile 2	-0.009	0.034***	-0.004	0.019	-0.014*	-0.009***	-0.016***
	(0.007)	(0.009)	(0.007)	(0.012)	(0.008)	(0.003)	(0.006)
Quintile 3	-0.010	0.055***	0.002	0.024*	-0.034***	-0.012***	-0.025***
	(0.008)	(0.010)	(0.007)	(0.013)	(0.008)	(0.003)	(0.006)
Quintile 4	-0.001	0.070***	0.002	0.004	-0.030***	-0.016***	-0.030***
	(0.008)	(0.009)	(0.007)	(0.012)	(0.008)	(0.003)	(0.006)
Quintile 5	0.003	0.090***	0.017**	-0.017	-0.039***	-0.020***	-0.035***
	(0.008)	(0.009)	(0.007)	(0.013)	(0.008)	(0.003)	(0.006)
Age (reference: 18-19)							
20-21	0.002	-0.012***	-0.067***	0.087***	0.006	0.001	-0.016***
	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)	(0.002)	(0.004)
22-23	0.007*	-0.087***	-0.113***	0.200***	0.017***	-0.000	-0.023***
	(0.004)	(0.006)	(0.005)	(0.007)	(0.005)	(0.002)	(0.004)
24-25	0.027***	-0.132***	-0.132***	0.267***	-0.001	-0.008***	-0.022***
	(0.007)	(0.008)	(0.006)	(0.010)	(0.006)	(0.003)	(0.005)
26-27	0.030***	-0.133***	-0.130***	0.242***	0.012	-0.011***	-0.011*
	(0.009)	(0.012)	(0.007)	(0.014)	(0.008)	(0.003)	(0.006)
28-30	0.008	-0.114***	-0.140***	0.132***	0.123***	-0.009**	0.000
	(0.010)	(0.018)	(0.007)	(0.017)	(0.014)	(0.004)	(0.007)
Country-of-origin (reference: Australian born)							
English speaking migrant	-0.008	0.021	0.001	-0.015	0.005	-0.002	-0.003
	(0.009)	(0.013)	(0.010)	(0.017)	(0.010)	(0.004)	(0.007)
Non-English speaking migrant	-0.009	0.029***	0.103***	-0.101***	-0.020***	-0.003	0.001
	(0.007)	(0.009)	(0.010)	(0.012)	(0.007)	(0.003)	(0.006)

Table 4 Continued

	Studying			Working and not studying			Not in the labour force (and not studying)
	Working		Not in the labour force			Unemployed	
	Full-time	Part-time		Full-time	Part-time		
Family status (reference: single with no children)							
Couple with no children	0.014**	-0.098***	-0.071***	0.131***	0.016***	-0.002	0.012***
	(0.006)	(0.006)	(0.004)	(0.008)	(0.005)	(0.002)	(0.003)
Couple with children	-0.044***	-0.101***	-0.057***	-0.136***	0.090***	-0.001	0.249***
	(0.004)	(0.009)	(0.006)	(0.009)	(0.008)	(0.003)	(0.011)
Single with children	-0.030***	-0.073***	0.007	-0.098***	0.043***	0.012***	0.140***
	(0.006)	(0.013)	(0.010)	(0.011)	(0.010)	(0.004)	(0.012)
Siblings (reference: None)							
One	0.005	0.016	-0.013	0.002	0.002	0.005	-0.016**
	(0.009)	(0.013)	(0.010)	(0.015)	(0.008)	(0.004)	(0.008)
Two	-0.002	0.009	-0.012	0.005	0.003	0.003	-0.007
	(0.008)	(0.012)	(0.010)	(0.015)	(0.008)	(0.004)	(0.008)
Three or more	-0.000	-0.008	-0.010	0.010	0.005	0.005	-0.002
	(0.009)	(0.013)	(0.010)	(0.015)	(0.008)	(0.004)	(0.008)
Live with at least one parent	0.004	0.054***	-0.056***	0.007	0.015***	-0.001	-0.024***
	(0.004)	(0.005)	(0.004)	(0.006)	(0.004)	(0.002)	(0.003)
Parents' post-secondary education (reference: None)							
One	-0.001	0.038***	0.009**	-0.022***	-0.011***	-0.006***	-0.008**
	(0.004)	(0.006)	(0.004)	(0.007)	(0.004)	(0.002)	(0.003)
Both	0.006	0.045***	0.022***	-0.058***	-0.005	-0.003	-0.005
	(0.005)	(0.006)	(0.005)	(0.009)	(0.005)	(0.003)	(0.004)
Parents' employment status (reference: None)							
One	0.018*	0.009	-0.014	0.036*	0.005	-0.015**	-0.039***
	(0.010)	(0.019)	(0.015)	(0.020)	(0.011)	(0.007)	(0.010)
Both	0.021**	0.033*	-0.032**	0.037*	-0.003	-0.021***	-0.036***
	(0.010)	(0.018)	(0.015)	(0.020)	(0.011)	(0.007)	(0.010)
Cohort (reference: YIT 65)							
YIT 70	-0.032***	0.069***	0.039***	-0.092***	0.002	0.014***	0.000
	(0.010)	(0.012)	(0.011)	(0.016)	(0.007)	(0.004)	(0.006)
YIT 75	-0.027***	0.108***	0.010	-0.107***	0.031***	0.011***	-0.026***
	(0.009)	(0.010)	(0.009)	(0.013)	(0.006)	(0.003)	(0.004)
LSAY 95	-0.054***	0.126***	-0.021**	-0.150***	0.057***	-0.005	0.047***
	(0.009)	(0.010)	(0.009)	(0.013)	(0.006)	(0.003)	(0.006)
LSAY 98	-0.060***	0.101***	-0.037***	-0.109***	0.059***	-0.003	0.050***
	(0.009)	(0.010)	(0.009)	(0.014)	(0.007)	(0.003)	(0.007)

Similar positive influences of numeracy and literacy scores are found in the Australian context by McMillan and Marks (2003). In particular, they found lower unemployment probabilities for those with higher scores. Our results also show that literacy scores significantly improve the labour market outcomes of young women. Young women with high literacy scores are less likely to be unemployed or working part-time. This effect is not found among young men. Although, literacy scores' effects seem somewhat less important for men

than for women, the results show that being in the top three literacy quintiles increases the probability of studying and decreases the probability of working full-time for men.

Youths who attended non-government (that is independent or Catholic) secondary schools, are more likely to be studying and less likely to be working full-time or unemployed compared to those from government schools. These effects seem more pronounced for those from independent schools than for those from Catholic schools. Youths attending independent or Catholic schools may benefit from better parental financial support than other youths, which also makes them more likely to pursue post-secondary education rather than to enter the labour market directly.

Regardless of gender, the probability of studying decreases while the probability of working increases with age. Age is also associated with lower probabilities of being unemployed or out of the labour force. As youths age, more of them are able to secure employment, especially full-time employment. For the oldest female age group (28-30), a small increase of full-time work probability is found, which is associated with a substantial increase in the probability to work part-time. This may correspond to the age at which many women give birth to their first child. Females aged 24-27 are more likely to be studying while working full-time compared to females in other age groups, possibly indicating that 24-27 is a crucial period for young females to enhance their education and to advance their career.

Tables 3 and 4 show that cohort effects are highly significant. Combining part-time work and study appears to be a popular way to pursue further education among the younger cohorts. More generally, the youths in the younger cohorts are more likely to work part-time, whether studying or not, and less likely to work full-time.. This may be a reflection of the structural changes that affected the labour market over the last decades.

4.2 Socioeconomic Background and Family Structure

Several studies report that parents with high occupational status are more likely to encourage their children to pursue further education and that they are also likely to have more resources available to support the cost of these studies (Averett and Burton 1996, Ordovensky 1995). In the absence of reliable information on parents' income, parents' employment status and education are combined to identify the effects of socioeconomic backgrounds. One would expect that educated parents are more likely to invest in their children's education and to provide support as a consequence of their own educational experience. As shown in Tables 3 and 4, both young males and females with one or both parents with post-secondary education are more likely than other youths to pursue further education. In addition, having both parents

employed decreases the probability of being unemployed for both males and females, and it reduces the probability of being out of the labour force for females. The effect of parental employment on the probability to be studying is not so clear. Although parental employment increases the probability to combine study and work, especially for females, it also has a negative effect on the probability to be studying and not working.

International studies suggest that youths from ethnic minority backgrounds are more likely to proceed to post-secondary education (see the British studies by Leslie and Drinkwatr, 1999; and Rice, 2000; and the US study by Nguyen and Taylor, 2003).[3] Youths from ethnic minorities may try to overcome the disadvantage of being discriminated against in the labour market by further investment in education. Treating education as the most likely route to success in the host country, migrant families are more likely to invest on their children's education. As shown in Tables 3 and 4,, after controlling for education and other characteristics, youths from non-English speaking countries are substantially more likely to be studying and less likely to be working full-time than their Australian born counterparts. However, young people from English-speaking countries are much more similar to the Australian born youth. Although young males from non-English speaking countries are slightly more likely to study and less likely to work than their Australia born counterparts, no significant difference is found between Australian born young females and those from non-English speaking countries.

As for the effects of siblings, Nguyen and Taylor (2003) suggest that the larger the number of siblings in the family, the harder it will be for the parents to support post-secondary education for their children. Consistent with the above finding, Table 3 shows that young males who have three or more siblings are more likely to be working full-time and less likely to be studying (and not working) than young males with no siblings. However, the number of siblings has barely any effect on females.

As expected, young males living independently are more likely to be working full-time (and not studying). However, both males and females living with at least one of their parents are more likely to work part-time. A possible explanation is that part-time work does not, in most cases, provides large enough earnings to leave the parental home and become financially independent. Young people living with at least one of their parents are also more likely to be

[3] Ethnic minorities in Nguyen and Taylor (2003) refer to blacks, Asians and Hispanics. In the British studies of Leslie and Drinkwatr (1999) and Rice (2000), it refers to black Caribbean, other blacks, Asians and other non-white.

combining study and part-time work but less likely to be studying and not working compared to young people who have left the parental home. This somewhat unexpected result is likely to be a mere reflection of the fact that a large majority of students still live with one of their parents (see Appendix Tables A.1 and A.2) and that most students combine work and study (see Table 1).

Having children affects women and men differently. Single women with no children (the reference group) are more likely to be studying and less likely to be out of the labour force than other women. Having children or being in a couple increases the probabilities of leaving the labour force or working part-time for women, while for men it increases the probability of working full-time. Comparing among the mothers, single mothers are more likely to be working full-time, studying or unemployed, whereas coupled mothers are more likely to be working part-time or out of the labour force.

4.3 Education and Macroeconomic Conditions

GDP growth indicates the general performance of the domestic economy, while unemployment reflects not only the strength of the economy but more particularly the state of the labour market. Tables 5 and 6 present the predicted probabilities of all seven employment and education outcomes and the marginal effects of macroeconomic conditions on these probabilities by level of education. Specifically, level of education refers to the highest education level that the young individuals have already achieved. The marginal effects indicate the percentage change of the predicted probabilities after a one-percentage point increase in GDP growth or in unemployment rate.

As shown in Panel 2 of Table 5 and 6, youths with an education level of Year 12 (the reference group), are the most likely to pursue further study. Youths with other education levels are more likely to participate in the labour market. Youths with the lowest education level (Year 11 or less), are the most likely to be working, and more particularly for males, the most likely to be working full-time, possibly reflecting the fact that they have spent more time on the labour market at any given age compared to young people with higher education. However, youths with the lowest education level are also the less likely to be studying and face the highest unemployment risks. Among females, those with the lowest education level are the most likely to withdraw from the labour force (and not study).

Table 5 Average marginal effects of macroeconomic conditions on males' employment and education outcomes by level of education

	Studying			Working and not studying			Not in the labour force (and not studying)
	Working		Not in the labour force			Unemployed	
	Full-time	Part-time		Full-time	Part-time		
Predicted Probabilities				Panel 1			
Year 11 or less	0.107***	0.032***	0.029***	0.695***	0.054***	0.040***	0.044***
	(0.005)	(0.003)	(0.003)	(0.009)	(0.004)	(0.003)	(0.003)
Year 12	0.125***	0.216***	0.140***	0.420***	0.054***	0.020***	0.026***
	(0.003)	(0.004)	(0.003)	(0.005)	(0.002)	(0.001)	(0.001)
Certificate	0.118***	0.116***	0.082***	0.560***	0.067***	0.025***	0.032***
	(0.005)	(0.006)	(0.004)	(0.008)	(0.004)	(0.002)	(0.002)
University	0.114***	0.113***	0.117***	0.472***	0.102***	0.027***	0.055***
	(0.008)	(0.008)	(0.010)	(0.013)	(0.008)	(0.004)	(0.007)
Marginal effects of education (reference: Year 12)				Panel 2			
Year 11 or less	-0.018***	-0.184***	-0.111***	0.275***	-0.000	0.020***	0.018***
	(0.006)	(0.005)	(0.005)	(0.010)	(0.004)	(0.003)	(0.003)
Certificate	-0.007	-0.099***	-0.058***	0.140***	0.013***	0.006**	0.006**
	(0.006)	(0.007)	(0.006)	(0.010)	(0.004)	(0.003)	(0.003)
University	-0.011	-0.103***	-0.023**	0.052***	0.048***	0.007	0.029***
	(0.008)	(0.009)	(0.010)	(0.014)	(0.009)	(0.004)	(0.007)
Marginal effects of GDP growth				Panel 3			
Year 11 or less	0.002	0.003*	-0.002**	0.002	-0.004***	0.000	-0.001
	(0.002)	(0.001)	(0.001)	(0.003)	(0.001)	(0.001)	(0.001)
Year 12	-0.003**	0.004***	0.003**	-0.003*	0.000	-0.002***	0.001
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Certificate	0.000	-0.001	-0.002	-0.003	0.003*	0.000	0.002*
	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.001)	(0.001)
University	0.001	-0.005*	0.000	0.001	0.001	-0.000	0.002
	(0.003)	(0.003)	(0.004)	(0.005)	(0.003)	(0.002)	(0.003)
Marginal effects of unemployment rate				Panel 4			
Year 11 or less	0.002	0.001	0.001	-0.013***	0.003**	0.005***	0.000
	(0.002)	(0.002)	(0.001)	(0.003)	(0.002)	(0.001)	(0.001)
Year 12	-0.009***	-0.003*	0.001	0.010***	0.001	0.000	-0.000
	(0.002)	(0.002)	(0.002)	(0.003)	(0.001)	(0.001)	(0.001)
Certificate	0.003	-0.003	0.002	-0.007**	0.001	0.001	0.003***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.001)	(0.001)
University	-0.004	0.003	0.003	-0.011**	0.001	0.001	0.006**
	(0.003)	(0.003)	(0.003)	(0.005)	(0.003)	(0.001)	(0.003)

Table 6 Average marginal effects of macroeconomic conditions on females' employment and education outcomes by level of education

	Studying			**Working and not studying**			**Not in the labour force (and not studying)**
	Working		Not in the labour			**Unem-ployed**	
	Full-time	Part-time	force	Full-time	Part-time		
Predicted Probabilities				Panel 1			
Year 11 or less	0.071***	0.071***	0.050***	0.503***	0.157***	0.038***	0.109***
	(0.005)	(0.006)	(0.004)	(0.011)	(0.007)	(0.003)	(0.005)
Year 12	0.098***	0.280***	0.127***	0.322***	0.092***	0.018***	0.063***
	(0.003)	(0.004)	(0.003)	(0.005)	(0.003)	(0.001)	(0.002)
Certificate	0.104***	0.153***	0.073***	0.471***	0.110***	0.023***	0.066***
	(0.004)	(0.005)	(0.003)	(0.007)	(0.004)	(0.002)	(0.003)
University	0.099***	0.132***	0.077***	0.522***	0.102***	0.021***	0.047***
	(0.005)	(0.006)	(0.006)	(0.010)	(0.006)	(0.003)	(0.004)
Marginal effects of education (reference: Year 12)				Panel 2			
Year 11 or less	-0.027***	-0.209***	-0.076***	0.181***	0.065***	0.020***	0.046***
	(0.006)	(0.007)	(0.005)	(0.012)	(0.007)	(0.003)	(0.005)
Certificate	0.006	-0.127***	-0.053***	0.149***	0.018***	0.005**	0.003
	(0.005)	(0.006)	(0.004)	(0.009)	(0.005)	(0.002)	(0.004)
University	0.001	-0.148***	-0.049***	0.200***	0.010	0.003	-0.016***
	(0.006)	(0.008)	(0.006)	(0.011)	(0.007)	(0.003)	(0.005)
Marginal effects of GDP growth				Panel 3			
Year 11 or less	0.002	-0.002	-0.002	0.007***	-0.004*	-0.001	-0.000
	(0.002)	(0.002)	(0.001)	(0.003)	(0.002)	(0.001)	(0.002)
Year 12	-0.000	0.002*	0.002**	-0.004***	-0.001	-0.000	0.001
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.000)	(0.001)
Certificate	-0.002	-0.001	-0.002**	0.006**	0.001	-0.000	-0.001
	(0.001)	(0.002)	(0.001)	(0.003)	(0.002)	(0.001)	(0.001)
University	0.002	0.001	-0.009***	0.015***	-0.002	-0.001	-0.007***
	(0.002)	(0.002)	(0.002)	(0.004)	(0.002)	(0.001)	(0.002)
Marginal effects of unemployment rate				Panel 4			
Year 11 or less	-0.003	-0.002	-0.005**	-0.010**	0.010***	0.000	0.009***
	(0.003)	(0.003)	(0.002)	(0.005)	(0.003)	(0.001)	(0.002)
Year 12	-0.007***	0.002	-0.000	-0.006***	0.004***	0.001**	0.006***
	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Certificate	-0.005**	-0.002	0.002	-0.008**	0.005**	0.001	0.007***
	(0.002)	(0.003)	(0.002)	(0.004)	(0.002)	(0.001)	(0.002)
University	0.001	0.014***	0.000	-0.027***	0.007**	0.000	0.005**
	(0.003)	(0.004)	(0.003)	(0.005)	(0.003)	(0.001)	(0.002)

Turning to the effect of GDP growth, the results show slightly stronger effects for females than for males. However, the small size of the marginal effects and the rather low significance levels indicate that GDP growth only has a limited impact. The largest effects are found for females with a university degree. For each additional point of GDP growth, females in this group see an increase in their full-time work probability by 1.5 percentage points, accompanied by a 1.6 percentage points decline in their probability to be out of the labour

force. GDP growth also increases, albeit to a lesser extent, full-time work probabilities for females with a certificate and for those who did not complete secondary school. The impact is quite different on females with an education level of Year 12. Females in this group become less likely to be in full-time work and more likely to pursue further education as GDP growth increases, possibly expecting higher returns on education.

As mentioned above, the impact of GDP growth on males is smaller in magnitude. The most affected are those with an education level of Year 12. Similar to females, males in this group become less likely to work full-time and more likely to study as GDP growth increases.

Panels 2 and 3 in Tables 5 and 6 show that unemployment rate has more profound and widespread effects on youths' education and employment outcomes than GDP growth. As unemployment rises, all males, except those with an education level of Year 12, face a decline in their full-time work probabilities. However, those with an education level of Year 11 or less is the only group to suffer significant higher unemployment risks. This group also sees an increase in their part-time work probabilities. Young males with a certificate or university degree become more likely to withdraw from the labour force. It is possible that youths are more inclined to take a gap year when facing a harsh labour market. However, this explanation is unlikely to apply to those with a certificate. For this group, withdrawal from the labour market is likely to be more a constraint than a choice.

Results are sensibly different for young males with an education level of Year 12. They become less likely to pursue further study as unemployment rises. This result is driven by full-time workers, who become less likely to be studying for additional qualifications while working. A possible explanation is that there might be fewer apprentices or traineeships on offer as the labour market deteriorates.[4]

Similar to males, all females see a sharp decline in their full-time work probabilities as unemployment rises. The decline is particularly large for females with a university degree, at 2.7 percentage points with each additional point of unemployment. For all females, this decline in full-time work probabilities is associated with an increase in the probabilities to withdraw from the labour force or to work part-time. The former may reflect an increase in the number of discouraged job seekers while the later possibly indicates that employers are more inclined to offer part-time rather than full-time positions as the labour market

[4] Most trainees and apprentices are classified as students working either full-time or part-time. Unfortunately, a clear distinction between trainees and apprentices and other students could not be made consistently in the dataset due to the poor quality of the information available in this regard in YIT surveys.

deteriorates, and more particularly in sectors with large female participation such as the service industries.

As unemployment rises, although females with a university degree become more likely to pursue further study, and thus to delay their entry into the labour market, all other females become less likely to study. Indeed, increases in unemployment can be perceived as additional uncertainty regarding the pay-offs attached to further education.

5. Conclusion

This study examines the effects of macroeconomic conditions on education and employment outcomes of young people after they have left school, while controlling for human capital endowments, socioeconomic background and family structure. The main finding is that the effects of macroeconomic conditions on education and employment outcomes differ by gender and by level of education. Overall, the effects of GDP growth are rather positive, encouraging youths to invest in further education and facilitating school-to-work transitions. As GDP growth increases, (i) females with a university degree become more likely to work full-time and less likely to withdraw from the labour force; (ii) females with a certificate and those who did not complete secondary school also see significant, although smaller, increases in their full-time work probabilities; (iii) young males and females with education level of Year 12 become more likely to pursue further education and less likely to work full-time, while males in this group also see a decrease in unemployment risks.

Overall, however, GDP growth effects are fairly small, particularly for males, and the effects of the unemployment rate appear to be more important. Although the effects vary significantly by gender and education level, overall the results reveal that increases in the unemployment rate tend to drive young people out of full-time work and into inactivity or part-time work. In addition, it tends to discourage further education. Only females with a university degree become more likely to pursue further education, thus delaying their entry on the labour market, whereas other females become less likely to study, perhaps perceiving increased uncertainty in terms of the returns to education. Males with an education level of Year 12 are also less likely to pursue further study as unemployment rises, possibly because it becomes harder to find a job to support the study's financial costs. However, unemployment does not affect the probabilities of other males to study. A result worth noticing is that males who did not complete secondary school suffer the largest increase in unemployment risks as the unemployment rate increases.

Appendix A. Summary Statistics for the Regression Sample

Table A.1 Sample sizes of YIT and LSAY cohorts over time

	Youth in Transition			LSAY		
Year	**65**	**70**	**75**	**95**	**98**	Total
1985	1,780	0	0	0	0	1,780
1986	1,457	0	0	0	0	1,457
1987	1,826	0	0	0	0	1,826
1988	1,609	1,438	0	0	0	3,047
1989	1,457	1,483	0	0	0	2,940
1990	1,327	1,319	0	0	0	2,646
1991	1,458	1,450	316	0	0	3,224
1992	1,344	1,311	2,386	0	0	5,041
1993	1,332	1,146	2,795	0	0	5,273
1994	1,338	1,041	2,322	0	0	4,701
1995	1,119	0	2,011	0	0	3,130
1996	0	0	1,932	0	0	1,932
1997	0	0	1,855	10	0	1,865
1998	0	0	1,545	478	0	2,023
1999	0	0	1,405	5,123	0	6,528
2000	0	0	1,172	4,210	27	5,409
2001	0	0	1,034	3,298	594	4,926
2002	0	0	0	3,404	4,791	8,195
2003	0	0	0	3,149	5,398	8,547
2004	0	0	0	2,976	5,058	8,034
2005	0	0	0	3,010	5,146	8,156
2006	0	0	0	2,412	4,013	6,425
Total	16,047	9,188	18,773	28,070	25,027	97,105

Note: Sample size numbers do not include secondary school students and respondents under 18 years of age.

Table A.2: Sample statistics for males[(a)] (unweighted results)

	Studying			Working & not studying				
	Working		Not in the labour force			Unemployed	Not in the labour force (& not studying)	ALL
	Full-time	Part-time		Full-time	Part-time			
Year 11 or less	0.16	0.02	0.03	0.28	0.15	0.37	0.26	0.19
Year 12	0.54	0.82	0.76	0.41	0.52	0.35	0.48	0.54
Certificate	0.21	0.12	0.15	0.22	0.21	0.22	0.17	0.19
University	0.08	0.05	0.06	0.09	0.12	0.06	0.09	0.08
Public secondary school	0.65	0.47	0.58	0.72	0.64	0.78	0.67	0.65
Catholic secondary school	0.21	0.27	0.22	0.18	0.21	0.15	0.20	0.20
Independent secondary school	0.14	0.26	0.21	0.11	0.15	0.07	0.14	0.15
Reading score: Quintile 1	0.12	0.05	0.07	0.15	0.14	0.24	0.18	0.12
Quintile 2	0.15	0.11	0.12	0.18	0.15	0.18	0.19	0.16
Quintile 3	0.19	0.15	0.16	0.20	0.18	0.19	0.18	0.19
Quintile 4	0.22	0.24	0.23	0.19	0.20	0.17	0.19	0.21
Quintile 5	0.33	0.45	0.41	0.27	0.32	0.22	0.26	0.33
Math score: Quintile 1	0.08	0.04	0.05	0.11	0.12	0.23	0.16	0.09
Quintile 2	0.14	0.08	0.10	0.18	0.17	0.19	0.19	0.15
Quintile 3	0.14	0.11	0.10	0.16	0.14	0.15	0.15	0.14
Quintile 4	0.24	0.22	0.24	0.23	0.23	0.19	0.21	0.23
Quintile 5	0.40	0.55	0.51	0.32	0.34	0.24	0.28	0.39
Age category: 18-19	0.30	0.38	0.42	0.16	0.28	0.26	0.36	0.26
20-21	0.29	0.38	0.35	0.25	0.30	0.32	0.24	0.29
22-23	0.21	0.18	0.17	0.27	0.25	0.24	0.23	0.23
24-25	0.12	0.04	0.04	0.17	0.11	0.08	0.09	0.12
26-27	0.05	0.01	0.01	0.09	0.04	0.06	0.05	0.06
28-30	0.03	0.00	0.01	0.06	0.02	0.04	0.03	0.04
Australian born	0.93	0.89	0.85	0.93	0.92	0.90	0.91	0.91
English speaking migrant	0.03	0.04	0.03	0.03	0.03	0.05	0.04	0.03
Non-English speaking migrant	0.04	0.08	0.12	0.03	0.04	0.05	0.05	0.05
Single with no child	0.80	0.95	0.93	0.70	0.85	0.80	0.86	0.79
Couple with no child	0.10	0.03	0.03	0.15	0.07	0.06	0.06	0.10
Couple with child(ren)	0.07	0.02	0.02	0.12	0.06	0.09	0.05	0.08
Single with child(ren)	0.03	0.01	0.03	0.04	0.02	0.05	0.03	0.03
No sibling	0.05	0.04	0.05	0.05	0.05	0.08	0.06	0.05
1 sibling	0.33	0.37	0.36	0.31	0.34	0.28	0.30	0.33
2 siblings	0.34	0.34	0.32	0.33	0.34	0.31	0.35	0.33
3 or more siblings	0.28	0.25	0.26	0.31	0.28	0.33	0.29	0.29
Live with at least one parent	0.60	0.76	0.63	0.51	0.68	0.64	0.65	0.60
Post-secondary education (parents)								
None	0.46	0.27	0.35	0.51	0.40	0.59	0.41	0.44
1 parent only	0.35	0.44	0.41	0.32	0.38	0.27	0.39	0.36
Both	0.19	0.29	0.24	0.17	0.22	0.13	0.20	0.20
Both parents not employed	0.02	0.01	0.03	0.03	0.02	0.05	0.04	0.03
One parent employed	0.23	0.16	0.24	0.25	0.20	0.28	0.24	0.23
Both parents employed	0.75	0.83	0.74	0.72	0.78	0.67	0.72	0.74

Note: (a) Males over 18 who have left secondary school. Column Proportions.

Table A.3: Sample statistics for females[(a)] (unweighted results)

	Studying			Working & not studying				
	Working		Not in the labour force			Unemployed	Not in the labour force (& not studying)	ALL
	Full-time	Part-time		Full-time	Part-time			
Year 11 or less	0.09	0.02	0.04	0.17	0.20	0.29	0.37	0.14
Year 12	0.55	0.80	0.73	0.40	0.44	0.35	0.37	0.54
Certificate	0.24	0.13	0.17	0.26	0.24	0.29	0.20	0.22
University	0.13	0.05	0.06	0.16	0.11	0.07	0.06	0.11
Public secondary school	0.63	0.52	0.62	0.69	0.70	0.79	0.77	0.65
Catholic secondary school	0.25	0.28	0.20	0.21	0.20	0.14	0.16	0.22
Independent secondary school	0.12	0.20	0.17	0.10	0.10	0.07	0.07	0.13
Reading score: Quintile 1	0.06	0.04	0.07	0.08	0.11	0.19	0.12	0.08
Quintile 2	0.13	0.10	0.12	0.16	0.17	0.18	0.20	0.14
Quintile 3	0.20	0.17	0.17	0.21	0.22	0.21	0.21	0.20
Quintile 4	0.21	0.25	0.22	0.22	0.21	0.19	0.19	0.22
Quintile 5	0.39	0.44	0.41	0.33	0.29	0.23	0.29	0.36
Math score: Quintile 1	0.09	0.05	0.08	0.10	0.15	0.22	0.17	0.10
Quintile 2	0.17	0.14	0.16	0.20	0.23	0.25	0.24	0.19
Quintile 3	0.15	0.14	0.15	0.17	0.15	0.17	0.17	0.16
Quintile 4	0.27	0.28	0.26	0.26	0.25	0.20	0.24	0.26
Quintile 5	0.32	0.38	0.36	0.26	0.22	0.16	0.19	0.29
Age category: 18-19	0.22	0.40	0.47	0.15	0.22	0.27	0.16	0.25
20-21	0.28	0.38	0.33	0.24	0.26	0.31	0.21	0.29
22-23	0.24	0.16	0.14	0.28	0.23	0.24	0.21	0.22
24-25	0.15	0.04	0.04	0.19	0.13	0.10	0.15	0.13
26-27	0.07	0.01	0.02	0.09	0.08	0.05	0.13	0.07
28-30	0.04	0.01	0.01	0.05	0.08	0.03	0.14	0.04
Australian born	0.92	0.89	0.85	0.93	0.92	0.93	0.93	0.91
English speaking migrant	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.03
Non-English speaking migrant	0.05	0.08	0.12	0.04	0.04	0.04	0.03	0.05
Single with no child	0.69	0.90	0.88	0.60	0.58	0.64	0.28	0.68
Couple with no child	0.18	0.05	0.05	0.23	0.14	0.13	0.10	0.15
Couple with child(ren)	0.10	0.03	0.04	0.13	0.23	0.14	0.50	0.13
Single with child(ren)	0.03	0.01	0.04	0.04	0.05	0.09	0.11	0.04
No sibling	0.05	0.04	0.04	0.05	0.05	0.04	0.07	0.05
1 sibling	0.34	0.36	0.33	0.32	0.31	0.31	0.23	0.32
2 siblings	0.33	0.35	0.34	0.33	0.34	0.31	0.31	0.34
3 or more siblings	0.28	0.25	0.29	0.30	0.31	0.34	0.38	0.29
Live with at least one parent	0.50	0.69	0.53	0.44	0.48	0.51	0.25	0.50
Post-secondary education (parents)								
None	0.46	0.32	0.39	0.52	0.52	0.64	0.62	0.47
1 parent only	0.33	0.41	0.37	0.31	0.30	0.24	0.25	0.33
Both	0.21	0.27	0.25	0.16	0.17	0.12	0.13	0.20
Both parents not employed	0.02	0.01	0.02	0.03	0.03	0.06	0.08	0.03
One parent employed	0.22	0.17	0.23	0.24	0.25	0.31	0.26	0.23
Both parents employed	0.76	0.82	0.75	0.73	0.72	0.63	0.66	0.74

Note: (a) Females over 18 who have left secondary school. Column Proportions.

Appendix B. Estimated Coefficients of the Multinomial Logit Model

Table B.1 Males' employment and education outcomes (53939 observations)

	Studying					
	Working					
	Full-time	Part-time	Not in the labour force	Working part-time and not studying	Unem-ployed	Not in the labour force (and not studying)
Education (reference: less than Year 12)						
Year 12	1.023***	1.616***	0.696*	-0.111	-0.967**	-0.480*
	(0.311)	(0.422)	(0.364)	(0.246)	(0.411)	(0.282)
Certificate	0.625*	0.744*	-0.321	-0.320	-0.789*	-0.714**
	(0.342)	(0.446)	(0.404)	(0.272)	(0.419)	(0.325)
University	-0.209	-0.636	-0.209	-0.700**	-0.864	-0.776*
	(0.381)	(0.480)	(0.513)	(0.329)	(0.575)	(0.433)
GDP growth	0.008	-0.046	-0.051	-0.043**	-0.043	-0.021
	(0.024)	(0.035)	(0.032)	(0.018)	(0.027)	(0.021)
GDP growth interacted with						
Year 12	0.004	0.073**	0.089***	0.047**	0.032	0.047*
	(0.026)	(0.036)	(0.034)	(0.022)	(0.038)	(0.026)
Certificate	-0.037	0.025	0.000	0.040	0.010	-0.010
	(0.029)	(0.039)	(0.037)	(0.025)	(0.039)	(0.032)
University	-0.016	0.013	-0.109**	-0.012	-0.019	-0.180***
	(0.035)	(0.044)	(0.046)	(0.033)	(0.065)	(0.047)
Unemployment rate	-0.026	-0.015	-0.083*	0.090***	0.024	0.122***
	(0.039)	(0.053)	(0.047)	(0.027)	(0.038)	(0.028)
Unemployment rate interacted with						
Year 12	-0.027	0.043	0.102**	-0.020	0.080	0.007
	(0.041)	(0.054)	(0.050)	(0.031)	(0.051)	(0.036)
Certificate	-0.002	0.019	0.129**	-0.020	0.042	0.025
	(0.045)	(0.057)	(0.054)	(0.035)	(0.054)	(0.041)
University	0.091*	0.196***	0.157**	0.037	0.043	0.043
	(0.050)	(0.062)	(0.067)	(0.043)	(0.071)	(0.059)
School type (reference: Government)						
Catholic	0.157***	0.327***	-0.079	-0.047	-0.450***	-0.083
	(0.053)	(0.047)	(0.061)	(0.054)	(0.106)	(0.072)
Independent	0.116*	0.474***	0.360***	0.039	-0.175	0.142
	(0.071)	(0.057)	(0.071)	(0.070)	(0.134)	(0.100)
Reading score (reference: Quintile1)						
Quintile 2	0.080	0.113	-0.088	-0.162*	-0.499***	-0.198*
	(0.107)	(0.105)	(0.113)	(0.091)	(0.136)	(0.112)
Quintile 3	0.167	0.237**	-0.125	-0.129	-0.517***	-0.269**
	(0.106)	(0.101)	(0.109)	(0.091)	(0.136)	(0.114)
Quintile 4	0.086	0.353***	-0.076	-0.190**	-0.493***	-0.217*
	(0.108)	(0.100)	(0.111)	(0.092)	(0.143)	(0.115)
Quintile 5	0.266**	0.601***	0.131	-0.147	-0.568***	-0.229**
	(0.106)	(0.100)	(0.109)	(0.093)	(0.146)	(0.115)
Math score (reference: Quintile1)						
Quintile 2	-0.130	0.196**	-0.059	-0.173**	-0.378***	-0.301***
	(0.091)	(0.091)	(0.104)	(0.081)	(0.119)	(0.096)
Quintile 3	-0.137	0.328***	0.030	-0.386***	-0.502***	-0.479***
	(0.095)	(0.091)	(0.107)	(0.087)	(0.130)	(0.104)
Quintile 4	0.015	0.478***	0.105	-0.290***	-0.630***	-0.512***
	(0.092)	(0.087)	(0.102)	(0.084)	(0.129)	(0.103)
Quintile 5	0.139	0.682***	0.363***	-0.326***	-0.821***	-0.568***
	(0.095)	(0.089)	(0.104)	(0.088)	(0.147)	(0.109)

Table B.1 Continued

	Studying					
	Working					
	Full-time	Part-time	Not in the labour force	**Working part-time and not studying**	**Unem-ployed**	**Not in the labour force (and not studying)**
Age (reference: 18-19)						
20-21	-0.282***	-0.401***	-0.842***	-0.236***	-0.248***	-0.539***
	(0.048)	(0.032)	(0.039)	(0.048)	(0.083)	(0.066)
22-23	-0.541***	-1.160***	-1.800***	-0.415***	-0.562***	-0.920***
	(0.057)	(0.044)	(0.059)	(0.055)	(0.100)	(0.075)
24-25	-0.504***	-1.654***	-2.339***	-0.742***	-1.075***	-1.027***
	(0.072)	(0.074)	(0.095)	(0.076)	(0.150)	(0.093)
26-27	-0.436***	-1.618***	-2.262***	-0.548***	-1.188***	-0.779***
	(0.094)	(0.114)	(0.137)	(0.091)	(0.188)	(0.108)
28-30	-0.399***	-1.219***	-2.253***	0.446***	-0.840***	-0.305***
	(0.118)	(0.167)	(0.188)	(0.101)	(0.235)	(0.114)
Country-of-origin (reference: Australian born)						
English speaking migrant	-0.045	0.172	0.087	0.087	-0.046	-0.009
	(0.126)	(0.109)	(0.141)	(0.118)	(0.217)	(0.149)
Non-English speaking migrant	0.258**	0.641***	1.265***	0.103	0.151	0.293**
	(0.103)	(0.081)	(0.092)	(0.100)	(0.172)	(0.131)
Family status (reference: single with no children)						
Couple with no children	-0.228***	-1.064***	-1.505***	-0.169***	-0.414***	-0.010
	(0.057)	(0.062)	(0.086)	(0.057)	(0.115)	(0.082)
Couple with children	-0.242***	-0.279***	-0.392***	1.171***	0.433***	2.767***
	(0.074)	(0.085)	(0.112)	(0.068)	(0.131)	(0.081)
Single with children	-0.109	-0.154	0.306***	0.715***	0.772***	2.088***
	(0.086)	(0.112)	(0.112)	(0.093)	(0.131)	(0.101)
Siblings (reference: none)						
One	0.054	0.079	-0.128	0.002	0.214	-0.292**
	(0.107)	(0.106)	(0.125)	(0.109)	(0.236)	(0.144)
Two	-0.036	0.029	-0.133	0.015	0.151	-0.123
	(0.107)	(0.106)	(0.125)	(0.108)	(0.234)	(0.143)
Three or more	-0.036	-0.091	-0.146	0.023	0.220	-0.052
	(0.107)	(0.107)	(0.126)	(0.108)	(0.235)	(0.143)
Live with at least one parent	0.033	0.246***	-0.559***	0.111**	-0.082	-0.456***
	(0.047)	(0.040)	(0.048)	(0.043)	(0.085)	(0.061)
Parents' post-secondary education (reference: None)						
One	0.074	0.315***	0.225***	-0.054	-0.235**	-0.108
	(0.053)	(0.048)	(0.058)	(0.051)	(0.093)	(0.068)
Both	0.252***	0.481***	0.479***	0.112*	0.010	0.054
	(0.063)	(0.055)	(0.069)	(0.063)	(0.126)	(0.083)
Parents' employment status (reference: None)						
One	0.125	-0.049	-0.224	-0.085	-0.578***	-0.682***
	(0.153)	(0.169)	(0.177)	(0.143)	(0.203)	(0.149)
Both	0.162	0.081	-0.393**	-0.160	-0.882***	-0.643***
	(0.149)	(0.166)	(0.175)	(0.140)	(0.201)	(0.146)
Cohort (reference: YIT 65)						
YIT 70	-0.010	0.838***	0.687***	0.260**	0.782***	0.206
	(0.108)	(0.119)	(0.126)	(0.116)	(0.184)	(0.132)
YIT 75	0.096	1.098***	0.531***	0.627***	0.707***	-0.394***
	(0.088)	(0.099)	(0.105)	(0.093)	(0.159)	(0.114)
LSAY 95	-0.108	1.243***	0.309***	1.078***	0.163	1.154***
	(0.091)	(0.102)	(0.110)	(0.092)	(0.172)	(0.109)
LSAY 98	-0.335***	0.945***	-0.082	0.975***	0.124	1.082***
	(0.094)	(0.103)	(0.113)	(0.096)	(0.173)	(0.116)
Constant	-1.820***	-3.467***	-0.469	-1.732***	-0.762	-1.366***
	(0.364)	(0.456)	(0.414)	(0.286)	(0.496)	(0.322)

Table B.2 Estimated coefficients of the multinomial logit model - Females' employment and education outcomes (43166 observations)

	Studying					
	Working					
	Full-time	Part-time	Not in the labour force	Working part-time and not studying	Unem-ployed	Not in the labour force (and not studying)
Education (reference: less than Year 12)						
Year 12	2.012***	3.667***	2.651***	0.948***	1.439***	0.342
	(0.243)	(0.536)	(0.461)	(0.340)	(0.381)	(0.382)
Certificate	0.469	2.449***	1.381***	0.436	0.563	-0.957**
	(0.291)	(0.571)	(0.513)	(0.394)	(0.470)	(0.469)
University	1.005***	2.352***	1.789***	1.166**	0.776	-0.196
	(0.373)	(0.629)	(0.581)	(0.459)	(0.658)	(0.559)
GDP growth	0.013	0.077	-0.083**	-0.080***	0.004	-0.016
	(0.020)	(0.048)	(0.039)	(0.027)	(0.028)	(0.033)
GDP growth interacted with						
Year 12	-0.028	-0.040	0.118***	0.095***	-0.073*	0.058
	(0.024)	(0.049)	(0.041)	(0.033)	(0.039)	(0.040)
Certificate	-0.004	-0.078	0.060	0.135***	0.007	0.096*
	(0.028)	(0.053)	(0.045)	(0.039)	(0.049)	(0.052)
University	-0.006	-0.124**	0.080	0.091*	-0.013	0.045
	(0.040)	(0.061)	(0.055)	(0.048)	(0.073)	(0.068)
Unemployment rate	0.048**	0.056	0.061	0.086**	0.159***	0.025
	(0.022)	(0.055)	(0.047)	(0.034)	(0.030)	(0.036)
Unemployment rate interacted with						
Year 12	-0.150***	-0.100*	-0.082	-0.087**	-0.177***	-0.063
	(0.026)	(0.056)	(0.050)	(0.037)	(0.040)	(0.042)
Certificate	-0.007	-0.065	-0.018	-0.055	-0.102**	0.084
	(0.031)	(0.061)	(0.055)	(0.043)	(0.047)	(0.051)
University	-0.054	0.003	0.001	-0.046	-0.086	0.111*
	(0.040)	(0.067)	(0.063)	(0.049)	(0.064)	(0.061)
School type (reference: Government)						
Catholic	0.199***	0.469***	0.202***	0.129*	-0.129	0.087
	(0.058)	(0.060)	(0.069)	(0.072)	(0.115)	(0.089)
Independent	0.292***	0.710***	0.513***	0.191**	-0.257*	0.175*
	(0.068)	(0.065)	(0.076)	(0.079)	(0.153)	(0.102)
Reading score (reference:Quintile1)						
Quintile 2	0.012	0.378***	0.233*	-0.086	-0.090	-0.026
	(0.090)	(0.118)	(0.123)	(0.104)	(0.144)	(0.116)
Quintile 3	-0.032	0.426***	0.226*	0.000	-0.123	-0.076
	(0.090)	(0.119)	(0.119)	(0.100)	(0.141)	(0.126)
Quintile 4	0.075	0.678***	0.436***	0.048	-0.042	0.024
	(0.092)	(0.116)	(0.118)	(0.105)	(0.155)	(0.125)
Quintile 5	0.079	0.944***	0.598***	0.301***	-0.063	0.148
	(0.094)	(0.114)	(0.115)	(0.103)	(0.157)	(0.125)
Math score (reference:Quintile1)						
Quintile 2	-0.025	-0.251*	-0.174	-0.300***	-0.566***	-0.401***
	(0.097)	(0.134)	(0.139)	(0.109)	(0.141)	(0.125)
Quintile 3	0.103	0.072	-0.081	-0.352***	-0.664***	-0.387***
	(0.102)	(0.133)	(0.136)	(0.113)	(0.150)	(0.131)
Quintile 4	0.204**	0.247*	0.237*	-0.363***	-0.715***	-0.508***
	(0.099)	(0.129)	(0.130)	(0.108)	(0.154)	(0.129)
Quintile 5	0.359***	0.637***	0.537***	-0.331***	-0.770***	-0.529***
	(0.098)	(0.127)	(0.129)	(0.109)	(0.156)	(0.131)

Table B.2 Continued

	Studying					
	Working					
	Full-time	Part-time	Not in the labour force	**Working part-time and not studying**	**Unem-ployed**	**Not in the labour force (and not studying)**
Age (reference:18-19)						
20-21	-0.611***	-0.506***	-0.828***	-0.341***	-0.148*	-0.837***
	(0.046)	(0.038)	(0.044)	(0.060)	(0.089)	(0.081)
22-23	-1.138***	-1.266***	-1.743***	-0.607***	-0.483***	-0.959***
	(0.058)	(0.055)	(0.064)	(0.073)	(0.105)	(0.094)
24-25	-1.358***	-1.885***	-2.678***	-1.045***	-1.019***	-1.388***
	(0.079)	(0.095)	(0.112)	(0.115)	(0.163)	(0.152)
26-27	-1.438***	-2.119***	-2.845***	-1.186***	-0.874***	-1.024***
	(0.100)	(0.147)	(0.168)	(0.153)	(0.190)	(0.188)
28-30	-1.491***	-2.236***	-3.103***	-0.839***	-0.958***	-1.053***
	(0.125)	(0.227)	(0.224)	(0.185)	(0.232)	(0.225)
Country-of-origin (reference:Australian born)						
English speaking migrant	0.030	0.330**	0.195	0.158	0.460**	0.330
	(0.136)	(0.136)	(0.156)	(0.142)	(0.180)	(0.209)
Non-English speaking migrant	0.216*	0.819***	1.376***	0.130	0.603***	0.334**
	(0.125)	(0.106)	(0.103)	(0.138)	(0.174)	(0.158)
Family status (reference: single with no children)						
Couple with no children	-0.172**	-0.930***	-1.266***	-0.355***	-0.719***	-0.762***
	(0.074)	(0.101)	(0.130)	(0.101)	(0.154)	(0.139)
Couple with children	-0.410***	-0.766***	-1.169***	-0.369***	-0.353**	-0.406**
	(0.093)	(0.135)	(0.152)	(0.130)	(0.164)	(0.175)
Single with children	-0.343***	-0.562***	-0.380***	-0.435**	-0.089	-0.202
	(0.093)	(0.143)	(0.107)	(0.175)	(0.173)	(0.213)
Siblings (reference: none)						
One	-0.147	0.057	-0.205	-0.094	-0.370**	-0.309*
	(0.120)	(0.129)	(0.136)	(0.135)	(0.180)	(0.175)
Two	-0.122	0.086	-0.280**	-0.080	-0.325*	-0.175
	(0.119)	(0.129)	(0.136)	(0.136)	(0.179)	(0.173)
Three or more	-0.238**	-0.029	-0.361***	-0.092	-0.248	-0.228
	(0.119)	(0.131)	(0.138)	(0.137)	(0.175)	(0.173)
Live with at least one parent	0.066	0.421***	-0.322***	0.368***	0.144*	0.044
	(0.046)	(0.051)	(0.056)	(0.061)	(0.086)	(0.077)
Parents' post-secondary education (reference: None)						
One	0.177***	0.404***	0.319***	0.119*	-0.114	0.241***
	(0.055)	(0.061)	(0.065)	(0.067)	(0.095)	(0.086)
Both	0.293***	0.498***	0.368***	0.176**	0.043	0.141
	(0.066)	(0.071)	(0.079)	(0.078)	(0.130)	(0.097)
Parents' employment status (reference: None)						
One	-0.011	-0.058	-0.625***	-0.418**	-0.518**	-0.398
	(0.153)	(0.234)	(0.203)	(0.182)	(0.210)	(0.249)
Both	0.039	0.136	-0.797***	-0.304*	-0.638***	-0.451*
	(0.150)	(0.230)	(0.199)	(0.178)	(0.208)	(0.249)
Cohort (reference: YIT 65)						
YIT 70	0.124	0.847***	0.275**	-0.223	0.329*	-0.809***
	(0.110)	(0.148)	(0.138)	(0.175)	(0.184)	(0.214)
YIT 75	0.239**	0.936***	0.075	0.700***	0.693***	-0.503***
	(0.094)	(0.127)	(0.120)	(0.136)	(0.171)	(0.184)
LSAY 95	-0.730***	0.666***	-0.469***	0.542***	-0.369**	0.268*
	(0.090)	(0.120)	(0.120)	(0.133)	(0.182)	(0.163)
LSAY 98	-1.247***	0.246**	-0.900***	0.297**	-0.393**	0.060
	(0.099)	(0.123)	(0.123)	(0.140)	(0.183)	(0.174)
Constant	-1.427***	-5.538***	-1.818***	-2.543***	-2.129***	-1.302***
	(0.300)	(0.601)	(0.514)	(0.403)	(0.385)	(0.473)

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