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The Impact of Tertiary Study on the Labour Market Outcomes of Low-qualified School Leavers

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The Impact of Tertiary Study on the Labour Market Outcomes of Low-qualified School Leavers

Sarah Tumen, Sarah Crichton and
Sylvia Dixon

New Zealand Treasury Working Paper 15/07

June 2015



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Low-qualified School Leavers

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The results in this report are not official statistics – they have been created for research purposes from the Integrated Data Infrastructure (IDI) managed by Statistics New Zealand. Ongoing work within Statistics New Zealand to develop the IDI means it will not be possible to exactly reproduce the data presented here.

Access to the anonymised data used in this study was provided by Statistics New Zealand in accordance with security and confidentiality provisions of the Statistics Act 1975. Only people authorised by the Statistics Act 1975 are allowed to see data about a particular person, household, business or organisation. The results in this report have been confidentialised to protect these groups from identification.

Careful consideration has been given to the privacy, security and confidentiality issues associated with using administrative and survey data in the IDI. Further detail can be found in the privacy impact assessment for the Integrated Data Infrastructure available from Statistics New Zealand.¹

The results are based in part on tax data supplied by Inland Revenue to Statistics New Zealand under the Tax Administration Act 1994. These tax data must be used only for statistical purposes, and no individual information may be published or disclosed in any other form or provided to Inland Revenue for administrative or regulatory purposes.

Any person who has had access to the unit-record data has certified that they have been shown, have read and have understood section 81 of the Tax Administration Act 1994, which relates to secrecy. Any discussion of data limitations or weaknesses is in the context of using the IDI for statistical purposes and is not related to the data's ability to support Inland Revenue's core operational requirements.

¹ http://www.stats.govt.nz/browse_for_stats/snapshots-of-nz/integrated-data-infrastructure/privacy-impact-assessment-for-the-idi.aspx

Abstract

This study examines the impacts of post-school education on the labour market outcomes of young people who leave school with few qualifications. Specifically, it estimates the effects of tertiary study on the employment rates, benefit receipt rates and earnings of young people who left school without completing NCEA level 2, who enrolled at a tertiary institution while they were aged 16–19. The benefits of the further education are measured by comparing the students' post-study outcomes with those of matched comparison groups of other poorly qualified school leavers who did not undertake any tertiary education.

We find that enrolling in a level 1–3 or level 4 certificate programme had a small positive impact on the employment of low-qualified school leavers, raising their employment rate by 3.4 percentage points on average, two years after they ceased studying. However, the benefits of tertiary study were confined to the 44% of students who completed a qualification and were not experienced by non-completers. Students who completed a level 1–3 certificate were 8.5 percentage points more likely to be employed and 6.4 percentage points less likely to be receiving a benefit than their matched comparisons two years after finishing. Slightly larger benefits were experienced by those who completed a qualification at level 4 or higher. The size of the employment impacts associated with gaining a qualification varied by gender and ethnicity, the type of tertiary provider and the subject area of the qualification. There was no evidence that tertiary study had a significant impact on participants' level of earnings, after controlling for their employment status.

JEL CLASSIFICATION I26

KEYWORDS Youth; foundation education; early school leavers; low qualifications

Executive Summary

This paper examines the labour market benefits that are gained by young people who leave school without NCEA level 2 if they enrol at a tertiary institution within the first few years after leaving school. The central question is whether, and to what extent, undertaking tertiary study raises the employment rates and earnings of these low-qualified school leavers compared with not doing any post-school study.

The research uses linked administrative data from the tax, benefit and education systems. These data sources provide information on the educational and labour market activities and benefit receipt of all young people in the birth cohorts of study.

Our study population comprises the young people who were born between July 1990 and June 1992 who left school without completing NCEA level 2 and who enrolled to study at a tertiary institution within the first few years after leaving school. Specifically, we study those who enrolled in a tertiary education programme in the period from 2006 to 2010 (while they were aged 16–19 years), had completed or withdrawn by the end of 2010 and did not re-enrol in 2011 or 2012.

We estimate the impacts of the tertiary study by comparing the labour market outcomes of the students in our study population with those of a matched comparison group of school leavers who did not undertake any tertiary study. The matching is done using the method of propensity score matching. The main outcomes considered are employment rates, benefit receipt rates and monthly earnings, evaluated two years (24 months) after the end of the study spell.

On average, undertaking tertiary education had a small positive impact on the employment rate of the low-qualified school leavers, raising their employment rate by 3.4 percentage points two years after they completed or withdrew from their tertiary programme. 58.1% of the low-qualified school leavers who enrolled in tertiary programmes were employed two years after they stopped studying compared with 54.7% of their matched comparisons. The estimated employment impact of enrolling in tertiary education is the difference between these two employment rates, or 3.4 percentage points. On average, undertaking tertiary education also had a small negative impact on the likelihood of being on a benefit two years later (-1.3 percentage points).

The benefits of tertiary study were confined to the 44% of students who completed a qualification, however, and were not experienced by non-completers. More than half of those who enrolled (56%) did not complete their programme and therefore did not gain a qualification. Non-completers did not improve their employment outcomes and were 2.9 percentage points more likely to be on a benefit two years later.

Approximately 29% of the low-qualified school leavers who enrolled in tertiary study completed a level 1–3 certificate and 13% a level 4 or higher qualification. Completing a level 1–3 certificate was associated with an 8.5 percentage point increase in the employment rate and a 6.4 percentage point reduction in the benefit receipt rate two years later. Completing a level 4 certificate or higher qualification was associated with a 10.7 percentage point increase in the employment rate and a 7.9 percentage point reduction in the benefit receipt rate.

The positive employment effects of completing a qualification were evident by three months after completion and were stable in level during the first two to three years rather than increasing through time.

Among the students who completed a qualification, the size of the employment and benefit rate impacts varied by gender and ethnicity, the type of tertiary provider and the subject area of the qualification.

Higher employment rates led to higher total monthly earnings for the youth who completed a qualification. However, we found no evidence that tertiary qualifications raised students' *levels* of earnings. Conditional on being in work, those who had secured a tertiary qualification had the same average monthly earnings as matched youth who did not undertake tertiary study.

To summarise, the results in this paper indicate that tertiary study has the potential to significantly improve the employment rates of youth who leave school without NCEA level 2 – but only if these youth complete a qualification. A high rate of non-completion was identified (with more than half failing to complete), which substantially reduced the average gains associated with the tertiary enrolment of this group. These findings suggest that policies or practices that either encourage more realistic enrolment decisions or improve the completion rates of those who enrol have the potential to improve the cost-effectiveness of the tertiary education that is undertaken by low-qualified school leavers.

The most important limitation of the study is that its impact estimates could be influenced by unmeasured differences in the characteristics of the study and comparison groups. We cannot rule out the possibility that the students who successfully completed a tertiary qualification may have had better employment outcomes and lower benefit receipt rates than non-participants, even if they had not studied, due to differences in characteristics that we do not have information about. A conservative approach would treat the paper's impact estimates as likely upper bound estimates of the true impacts of tertiary study for low-qualified school leavers.

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The Impact of Tertiary Study on the Labour Market Outcomes of Low-qualified School Leavers

1 Introduction

Young people who leave secondary school with few qualifications are at greater risk of becoming unemployed or inactive during their teens or early 20s than those who leave with a higher level of attainment (Dixon, 2014; Earle, 2010a). In 2014, the employment rate of 20–24-year-olds who had no formal qualifications was just 54%, 8 percentage points below the employment rate of 20–24-year-olds with school qualifications and 22 percentage points below the employment rate of 20–24-year-olds with post-school qualifications.²

The New Zealand Government has set a goal of increasing the proportion of young people who obtain *either* the NCEA level 2 certificate at school *or* equivalent post-school qualifications by the age of 18. A level 2 qualification is regarded as the desirable minimum level of educational attainment needed to participate in tertiary education, support entry to the workforce and facilitate full participation in society.³ Although qualification attainment rates in schools have been rising rapidly, the numbers who leave school without a level 2 qualification continue to be substantial. In 2009, 33% of school leavers had not achieved an NCEA level 2 certificate. In 2013, the equivalent proportion was 26%.⁴

Many of the programmes that tertiary institutions and private training providers offer at the lower qualification levels are open to school leavers that have not completed NCEA level 2. Post-school qualifications at levels 1–3 provide a ‘second chance’ for these young people to acquire basic qualifications through programmes that are pitched at an academic level similar to upper secondary school, but with a greater vocational focus⁵

This study examines the benefits that are gained in practice by low-qualified school leavers who enrol in a level 1–4 tertiary programme within the first few years after leaving school. Specifically, it selects all young people who were born between July 1990 and

² Calculated from published statistics, sourced from the Household Labour Force Survey.

³ Credits towards an NCEA level 2 certificate can be obtained in any year at secondary school but are most often obtained in year 12. At least 80 credits must be completed, including 60 at level 2.

⁴ Calculated from published Ministry of Education statistics.

⁵ Students without a NCEA level 2 certificate may also enrol for a post-school qualification at level 4 or higher, but they must begin with courses taught at lower levels.

June 1992 and enrolled as domestic students at New Zealand schools at the start of 2006 or 2007 and tracks their subsequent educational pathways and outcomes. The study population comprises the subset who left school without completing NCEA level 2, who subsequently enrolled in a level 1–4 tertiary programme during the period from 2006 to 2010 (while aged 16–19 years), had completed or withdrawn by the end of 2010 and did not study in 2011 or 2012.

The study addresses the following questions:

- What impact does *participating in tertiary education* have on the employment and benefit outcomes of young people who have left school without a level 2 NCEA certificate?
- What impact does *completing a tertiary qualification* have on the outcomes of these low-qualified school leavers?
- To what extent do these impacts vary by the demographic characteristics of participants, by institution and field of study?

The impacts of the tertiary study were estimated by comparing the outcomes of the poorly qualified school leavers who enrolled with those of a matched comparison group of school leavers who did not enrol. The matching was done using the method of propensity score matching. The impacts of the education on subsequent employment outcomes were measured two years (24 months) after the student finished studying.⁶

The research uses linked longitudinal data from the tax, benefit and education systems that have been incorporated into the Integrated Data Infrastructure (IDI) at Statistics New Zealand. These datasets provide comprehensive information on school leavers who studied at tertiary institutions, including their school leaving date, highest school qualification, the level and field(s) of their tertiary study and the tertiary qualifications they completed. Information on income from wages and salaries, self-employment and benefits and whether someone is overseas is also available.

To foreshadow the main results, the findings show that enrolling in tertiary programmes led on average to small improvements in participants' employment rates and average earnings two years later. Small to substantial employment rate increases were experienced by the 44% of students who completed a qualification. Students who did not complete the programme they enrolled in (56%) did not show any improvement in their subsequent employment rates and were slightly more likely to be in receipt of a benefit.

⁶ Two years was the maximum 'follow-up' period for which the outcomes of everyone in the study population could be observed.

2 Background

2.1 Post-school education at levels 1–3 and level 4

Level 1–3 certificates are roughly equivalent in academic level to upper secondary school qualifications, but they have a much greater vocational focus and tend to be shorter in duration than a school year. They are intended to either prepare people for entry-level employment or to enable them to progress to higher levels of vocational education (Earle, 2010b). Enrolment in many level 1–3 certificate programmes is open to people who have not completed NCEA level 2.

People whose highest qualification is a post-secondary level 1–3 certificate are commonly employed in clerical, sales and service or semi-skilled manual occupations. Some level 1–3 certificates provide trade-related skills, but they do not constitute trade qualifications. Post-secondary level 1–3 qualifications also provide a pathway to further study, providing the prerequisites for enrolment at level 4 or higher.

The level 1–3 certificate pathway to higher education is particularly important for young people who have left school without University Entrance or NCEA level 2. They will generally need to take level 1–3 courses first to gain the prerequisites for enrolment in courses at higher levels.

Level 4 certificates provide more advanced employment-related education and generally involve around one year's full-time equivalent study. People whose highest qualification is a level 4 certificate are most likely to work as trades workers or technicians (Earle, 2010b).

The majority of post-secondary level 1–4 qualifications are offered by institutes of technology and polytechnics (ITPs), wānanga and private training establishments (PTEs). A wānanga is a publicly owned tertiary institution that provides education in a Māori cultural context. A PTE is a privately owned educational entity, such as a training operation owned by a company, an English language school or a privately owned design school. There are more than 800 PTEs in New Zealand, and in 2013, 30% of all students who were enrolled in level 1–3 tertiary programmes were enrolled at a PTE.⁷

2.2 Tertiary enrolment and completion rates of low-qualified school leavers

This section provides background information on the numbers of young people in New Zealand who leave school without gaining an NCEA level 2 certificate, and their subsequent tertiary enrolment and completion rates. Statistics for five recent birth cohorts are set out in Table A1. These numbers were calculated using a later version of the data on school enrolments and achievements than that used for the analysis in the rest of the paper, which means the figures differ slightly.

The numbers in the top section of Table A1 show that the proportion of young people from each birth cohort who left school without gaining an NCEA level 2 certificate declined rapidly over time, from 36% of the 1990–91 cohort to 24% of the 1994–95 cohort.

⁷ Calculated from published Ministry of Education statistics.

In the rest of the table, we give the proportion of these low-qualified school leavers that had enrolled in tertiary study and the proportion that had completed a qualification at each year of age from 17 upwards.

Nearly half of the low-qualified school leavers in the first two birth cohorts had enrolled in a tertiary programme by their 20th birthday. Qualification completion rates were much lower than enrolment rates, however. Only about 20% of the low-qualified school leavers in these birth cohorts had completed a tertiary qualification by their 20th birthday. Most of the qualifications they completed were level 1–3 certificates. Just 5–6% had completed a level 4 or higher qualification before their 20th birthday.

These results suggest that the tertiary education system has been fairly successful at encouraging low-qualified school leavers to enrol in further study but less successful in retaining these students through to the completion of a certificate. Progression to higher levels of study has also been limited.

2.3 Previous research findings

Our literature search focused on the question of whether young people who leave school with few qualifications are able to improve their employment outcomes if they participate in post-school educational programmes that provide ‘second chance’ qualifications, roughly equivalent in level to upper secondary school qualifications. We looked for studies with research designs that were more likely to isolate the causal impact of the education, for example, those using difference-in-difference approaches to compare the labour market outcomes of young people who enrolled in post-school study with those of matched non-students before and after the study spell.

We were not able to locate any high-quality studies focused on this specific question but found a number of studies offering relevant insights. McIntosh (2004) is a frequently cited British study that examined the impact of post-school vocational study undertaken by unqualified school leavers. The paper used cross-sectional and longitudinally linked Labour Force Survey data to estimate the labour market benefits gained by individuals who left school in the mid-1990s without qualifications but then completed a vocational qualification by the age of 23–25 years (at any level). The employment rates and wages of this group were compared with those of unqualified school leavers who did not obtain any vocational qualifications. The results showed positive impacts on employment rates. Young people who left school without any qualifications were more likely to be in work when aged 23–25 years if they had achieved vocational qualifications after leaving school. Vocational qualifications had little impact on wages, however.

McIntosh acknowledges several alternative explanations for these results, including selection effects (those who choose to participate in post-school education may have characteristics that made them more likely to be employed) and reverse causation (it is easier to acquire vocational qualifications once in employment). The data and study design do not allow these alternative explanations of the positive employment impacts to be investigated and ruled out.

Stromback (2010) investigates the benefits that early school leavers in Australia gain by completing a vocational qualification, by estimating the impact of the qualification on their weekly earnings and hourly wages when they are aged in their mid-20s. The data source for this study is the Longitudinal Survey of Australian Youth, and the study population is youth who left school at an early age during the mid-1990s. These young people were

followed in the survey until 2006, when they were aged in their mid-20s. A propensity score matching approach was used to construct a matching control group of other early school leavers who did not complete a vocational qualification against which the outcomes of the study population or 'treatment group' were compared. Measures of academic ability and socioeconomic characteristics were included in the matching model. The estimates given in the paper represent the average impact of all vocational qualifications completed by this study population, regardless of their level.

Stromback finds no evidence that vocational qualifications have statistically significant effects on the early career earnings of early school leavers. Rather than concluding the qualifications were not useful, he suggests the lack of significant earnings benefits may be due to the relatively short follow-up period. The group who returned to education had gained less work experience by their mid-20s than other early school leavers. Over a longer timeframe, he argues, the effects of the difference in early work experience are likely to fade while the benefits of the education may become more pronounced.

Summarising, the first of these two studies finds evidence of a positive impact of post-school vocational study on employment rates. Neither finds evidence of an impact on wages. Unlike the current paper, neither paper focused specifically on the impacts of participation in courses at the lowest levels of post-secondary education (ie, courses roughly equivalent to upper secondary school in academic demands). Both studies used survey rather than administrative data, and the small number of early-school-leaver observations available prevented the researchers from examining the effects of specific pathways or specific tertiary qualifications.

The prior New Zealand research on this topic is limited. Earle (2010b) used cross-sectional survey data to compare the employment rates and earnings of working-aged adults who had completed level 1–3 certificates with those of adults who had no qualifications. He found that adults whose highest qualification was a level 1–3 certificate had lower employment rates and incomes than adults whose highest qualification was an upper secondary school certificate, but higher employment rates and incomes than adults who had no qualifications at all. But because this study used a cross-sectional rather than a longitudinal study design, it is not able to clearly identify the contribution of the educational attainment to the difference in outcomes.

Crichton and Dixon (2010) analysed the labour market benefits associated with the completion of post-school qualifications by adults aged 25 and over. Using a longitudinal design, the study compared the earnings growth experienced by adults who completed a tertiary qualification at levels 1–6 with the earnings growth experienced by a matched comparison group of adults who did not return to education. It found that those who completed a level 1–3 or a level 4 certificate generally did not improve their earnings during the following three years. However, significant earnings benefits were gained by a minority of students in particular fields of study. The study design did not include people aged under 25, and therefore the paper does not provide any results for younger students.

Crichton (2013) analysed the labour market benefits associated with the completion of post-school qualifications for those aged 18 and over who had been supported by benefits for at least 6 months immediately before they started studying. Using a longitudinal design, the study compared the benefit, employment and earnings of beneficiaries who studied with the outcomes experienced by a matched comparison group of beneficiaries who did not study. It found that those aged 18–24 years who completed a qualification at level 1–3 were 7 percentage points more likely to be employed and 4 percentage points less likely to be receiving a benefit 5 years after starting study than matched comparisons.

Larger benefits were experienced by those who completed a qualification at level 4 or higher.

The current paper is the first New Zealand study to use longitudinal data and a comparison group design to study the labour market impacts of level 1–3 tertiary programmes undertaken by young, poorly qualified school leavers. A strength of this research is that, by using administrative rather than survey data, we are able to study all low-qualified school leavers in a given birth cohort and disaggregate this population to a much greater degree than would be possible with survey-based data.

3 Methods

3.1 Data sources

The study uses data from Statistics New Zealand's Integrated Data Infrastructure (IDI), which combines administrative data from the tax system with information from the benefit and education systems. The IDI provides longitudinal monthly information on individuals' employment, earnings and receipt of income support payments over the period 1999–2012 as well as comprehensive information on tertiary enrolments over the period 2003–2012. It also provides comprehensive data on secondary school enrolments and NCEA qualifications completed from 2006 onwards.

For each person who participates in tertiary education, the IDI contains information on the enrolment dates, level and field of study, equivalent full-time study units (EFTS) associated with the proposed programme of study in the current year and total EFTS associated with the qualification that was enrolled in. It also provides information on whether the programme of study (ie, the set of courses associated with a qualification) was completed.

It is not possible to reliably distinguish qualifications at level 1, 2 and 3 in the administrative data, and thus we can only present grouped results for levels 1–3. The majority of programmes in this category are at level 3. Students who formally withdraw from a course in the first few weeks do not attract government funding and are not included in the enrolment data.

Both tertiary programmes funded through the mainstream tertiary funding system and those funded by specific training funds such as Training Opportunities, Youth Training and Youth Guarantee are included in the IDI.

3.2 Study population selection criteria

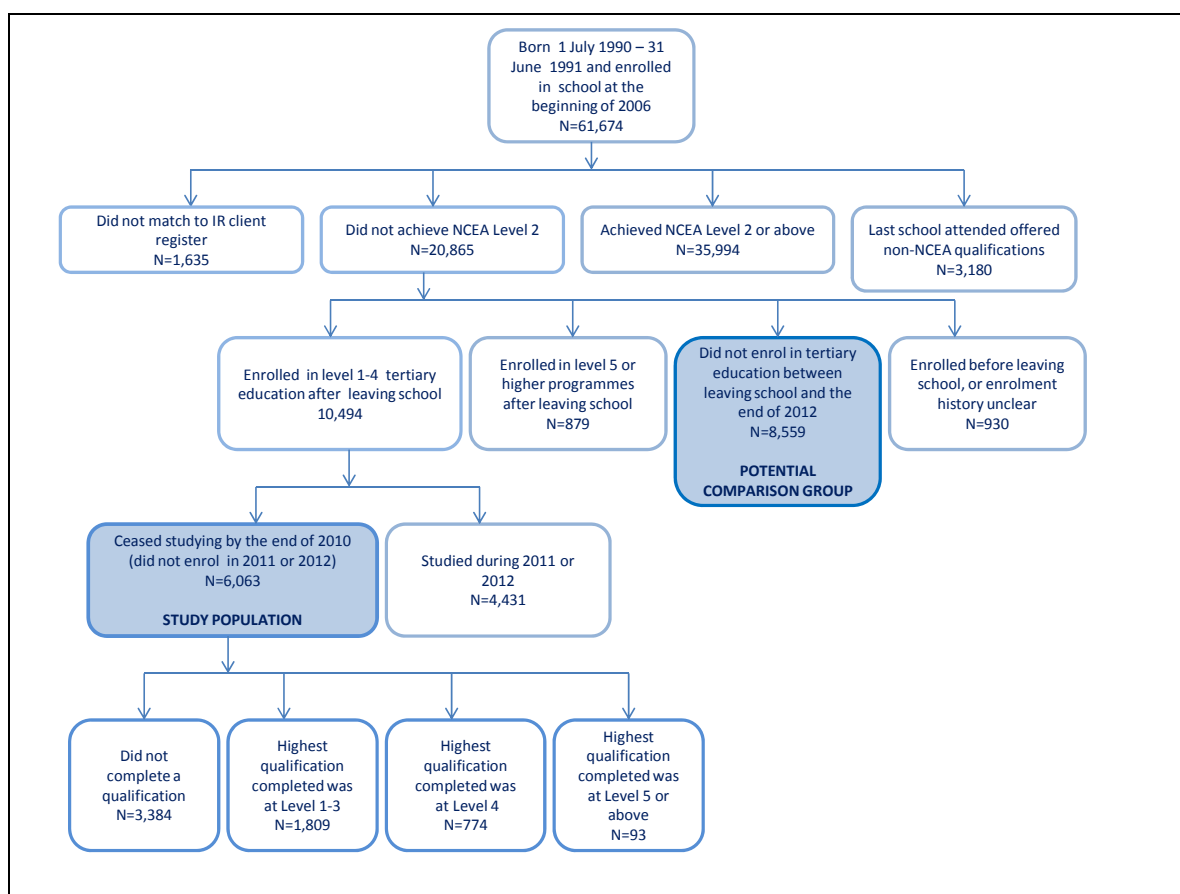
We focus on young people who were born between 1 July 1990 and 30 June 1992 who left school without completing NCEA level 2 but studied at a tertiary institution during the following few years (specifically between their date of leaving school and the end of 2010). The July 1990 to June 1992 birth cohorts were selected to ensure that information on school enrolment, benefit and employment status would be available for everyone for at least 36 months before the start of the tertiary study spell and at least 24 months after the completion of the study spell. At the time the study was begun, the available data in the IDI covered the period from 1999 to the end of 2012.

We identified the study population using the school enrolment records of all young people who were enrolled in New Zealand schools as domestic students at the start of the year when they would have been expected to study towards NCEA level 1: 2006 for the July 1990 to June 1991 birth cohort and 2007 for the July 1991 to June 1992 birth cohort. 2006 is the first year in which a complete set of school enrolment data is available in the IDI and the school leaving date of each child is known (at least approximately).

Figure 1 illustrates the method of selecting the study population, focusing on the 1990–91 birth cohort (ie, half the study sample). About 61,700 children who were born between 1 July 1990 and 30 June 1991 were enrolled at New Zealand schools as domestic students at the beginning of 2006.⁸ We excluded those who did not have a match to the Inland Revenue register and therefore could not be linked to other data sources in the IDI (1,600) and those who attended schools that offered international school qualifications (3,200). We lack good data on the qualification achievements of the children who attended schools where most students study towards international qualifications.

Of those who attended schools offering NCEA, around 20,900 left school without having completed NCEA level 2. We label this group ‘low-qualified school leavers’ and track their tertiary enrolment patterns in the period until the end of 2012.

Figure 1 – Selection of the study population: 1990–91 birth cohort



Notes: Counts have been randomly rounded to base 3. Figures have been derived from the Integrated Data Infrastructure (IDI) managed by Statistics New Zealand.

⁸ Using the better-quality enrolment data that are available for more recent years, we estimate that around 3% of students in the 1990–92 birth cohorts are likely to have left school before the beginning of 2006.

Around 10,500 of the low-qualified school leavers enrolled at a tertiary institution in a level 1–4 certificate programme between leaving school and the end of 2012. The enrolments that are counted include all student-achievement component-funded courses at this level and enrolments funded by specific training funds such as Training Opportunities, Youth Training and Youth Guarantee.

Of this group, approximately 6,000 were no longer enrolled in 2011 or 2012. This subgroup represents our study population. The rationale for restricting our study population to those who were not studying in either 2011 or 2012 is to ensure that their employment outcomes in this follow-up period were not affected by their educational activity. Another 4,400 were still enrolled in 2011 or 2012 and are excluded from the study population.

Of the 6,000 low-qualified school leavers who were included in the study population, around 3,400 had not completed a qualification by the time they ceased studying, 1,800 had completed a level 1–3 certificate and 800 had completed a level 4 or higher qualification.

An equivalent approach was used to select study population members from the cohort of young people who were born between 1 July 1991 and 30 June 1992, giving a total study sample (from both birth cohorts combined) of approximately 10,890.

3.3 Defining periods of study and outcome measures

3.3.1 Periods of tertiary study

Some students in the study population had more than one spell of tertiary study between the date of leaving school and the end of 2010. If that was the case, their post-study outcomes were measured in the 24 months following the end of their last study spell.

3.3.2 Outcome measures

Due to the manner in which tax data are collected, the employment and earnings measures in the IDI are available on a calendar month basis only. There are no measures of weekly earnings, hourly earnings or hours of work in the IDI.

In this study, a person is classified as ‘employed’ in a given calendar month if they received any wage and salary earnings in that month (that was reported through the tax system). An ‘employment rate’ measures the proportion of people who received any wage and salary earnings in a particular month. Similarly, a person is classified as ‘in receipt of a benefit’ if they received any income from one of the main income support benefits during the month, and the ‘benefit receipt rate’ is the proportion of people who received any benefit income in the specified month. It is possible to be employed *and* receive benefit income in the same month; they are not mutually exclusive states.

Average earnings were calculated using the IDI data on the total gross wage and salary income earned by each individual in each calendar month. We use two measures of average earnings. One includes people whose earnings were zero, while the other excludes them. The first measure is used to analyse changes in the total earnings of the entire study population. The second is used to study changes in earnings *levels*,

conditional on being employed. Note that monthly earnings can be affected by changes in hours worked as well as by changes in wage rates.

Our monthly employment, earnings and benefit receipt measures were further refined by excluding people who were overseas for the whole of the calendar month – 10% of the study sample members were overseas 24 months after the end of their study spell. Not excluding those who were out of New Zealand would have led to an underestimation of employment and benefit receipt rates.

3.4 Impact estimation methods

The impact of tertiary study is estimated by using the method of propensity score matching⁹ to construct comparison groups of low-qualified school leavers who are as similar as possible to the individuals in the study population but did not enrol in tertiary study. The outcomes of these comparison group individuals provide the ‘counterfactual’ against which the outcomes of the students (the ‘treatment group’) are compared. Differences between the benefit and employment rates and earnings of the two groups in the follow-up period provide our estimates of the impact of tertiary study.

More specifically, the method has three parts. First, a pool of potential comparison group matches was created by selecting all low-qualified school leavers who never undertook any tertiary study during the observation period (2006–2012). The potential comparison group members are highlighted in Figure 1 on the right-hand side of the diagram. The potential comparison group comprised about 8,500 individuals from the 1990–91 birth cohort and about 9,200 from the 1991–92 birth cohort. We refer to them as ‘non-participants’.

The characteristics and prior activities of non-participants can be measured in each calendar month from January 2006 through to December 2010. We created a vector of monthly records for each non-participant containing information on their personal characteristics, school characteristics, educational participation and attainment and prior employment and benefit histories, measured at each month in this five-year period. This generated around 1 million non-participant records. The purpose of creating this pool of non-participant records was to ensure we could match each student in the study population with a group of non-participants whose characteristics and life histories matched those of the student *in the reference month* – the month when the student first enrolled.

In the second stage, we took a random sample of 60,000 of the non-participant records and used them along with the study group records to estimate logistic regression equations modelling the probability of starting a tertiary study spell. The probability of starting a tertiary study spell was modelled as a function of demographic characteristics (including year of birth, gender and main ethnicity), secondary school characteristics (including region and school decile), attainment at secondary school, employment and benefit receipt history and time elapsed since leaving school. A full list of the explanatory variables included in the regressions is given in Table A2 in the Appendix.

Separate regression models were estimated for enrolment at ITPs and enrolment at PTEs, because this segmentation of the sample led to a better model fit in both cases.

⁹ A good overview of the propensity score matching method is given in Caliendo and Kopeinig (2005).

Predicted probabilities of enrolling were then calculated for all members of the treatment group and potential comparison group (not just the subsample of potential comparisons who were used in the regressions) using the propensity scores from each regression model. These predicted probabilities are referred to as 'propensity scores', following the terminology of Rosenbaum and Rubin (1983).

The third stage of the method was to match each individual in the study population with a group of 'matched comparison' individuals. Matches were only made between individuals from the same birth cohort who were observed in the same reference month (determined by the student's month of enrolment), had exactly the same gender, main ethnicity and highest secondary school qualification and had a similar time gap between leaving school and enrolment (or the reference month). Within those constraints, each treated individual was matched to up to 20 comparison group individuals with the closest values of the propensity score from the relevant model (ITP or PTE) within a radius of plus or minus 0.03 propensity score points. Fewer than 20 matches were selected if fewer than 20 people met these criteria. Matching with replacement was used, meaning that each comparison group individual could be matched to more than one treated individual.

Each matched comparison record was assigned a weight based on the number of matches made (eg, 0.05 if the individual was one of 20 matches for a particular study sample member). These weights were applied in all subsequent analysis.

We dropped individuals in the study population who could not be matched with one or more non-participants. This reduced the size of the study population from around 10,900 to around 9,900 and yielded an overall match rate of 91%. The match rate did not vary greatly by demographic or educational characteristics. However, members of some small population subgroups, such as people in the Pacific ethnic group, were less likely to be matched. In the case of Pacific peoples, for example, the match rate was 80%. The proportion of each subpopulation that was matched to at least one comparison group individual and therefore retained in the final sample for analysis is shown in Appendix Table A3.

The three-stage matching method is designed to balance the average characteristics of the treatment and matched comparison groups. After matching, there were no remaining statistically significant differences in variable means between the treated and comparison groups for any of the model variables (as listed in Table A2). Although we did not exact match on every variable, the method ensured that the matched samples were very similar in terms of their regional profiles, distributions of NCEA credits attained at school, time gap between leaving school and being selected for the study and other key variables.

The standard errors were estimated using bootstrapping methods (100 replications, sampled at the individual level prior to propensity estimation).

4 Profile of the study population and its enrolment decisions

4.1 Characteristics and activities before tertiary study

Table A4 summarises the demographic characteristics, school characteristics and school attainment of low-qualified school leavers in our study population. Males made up 59% of the study population, reflecting their higher likelihood of leaving school early. Using a prioritised measure of each person's main ethnicity in which 'Māori' is given first priority, 45% were classified as NZ European, 39% as Māori and 9% as Pacific peoples.

Just 27% attended secondary schools that were classified by the Ministry of Education to deciles 1–3, indicating they were located in neighbourhoods of low socioeconomic status. Around half attended schools classified to deciles 4–7, and 21% attended schools at deciles 8–10.

One-third completed NCEA level 1 before leaving school, while the remaining two-thirds left without any formal qualifications. However, the vast majority gained some credits towards NCEA level 1 while at school, and around half gained some credits towards NCEA level 2. The average number of credits obtained across all subjects and levels was 63.

By comparing the columns for all students and all non-participants in Table A4, we can see that the profile of the low-qualified school leavers who enrolled in level 1–3 tertiary study is broadly similar to that of the low-qualified school leavers who did not undertake any tertiary study. Those who enrolled had a similar demographic profile and similar levels of school achievement to the non-participants, as measured by their NCEA credits and qualifications. However, they were slightly more likely to be female and to live in one of the main urban areas.

Table A5 summarises the activities that were undertaken between leaving school and beginning tertiary study. Thirty-one percent of the students enrolled within three months of leaving school, and the majority (83%) enrolled within 18 months of leaving school.

Two-thirds undertook some paid employment in the 18 months before enrolling, but only 22% were employed for more than 12 months. While in paid employment, the vast majority had average monthly earnings below the full-time equivalent of the minimum wage (about \$2,200 a month). This indicates that most were working in part-time or part-month (casual) jobs. The majority (more than 88%) received no benefit income in the 18 months prior to enrolling.¹⁰

4.2 Tertiary study participation and attainment

Tertiary enrolment patterns are tabulated in Table A6. More than half (59%) of the low-qualified school leavers in our study population enrolled at an ITP, 4% at a wānanga, 35% at a PTE and a very small number at a university. Universities and wānanga are grouped with ITPs in the analysis that follows because of the low numbers of students at those institutions.

¹⁰ People under 18 years of age are generally not eligible for income support benefits except in a limited set of circumstances.

The majority (80%) enrolled in a level 1–3 programme initially, but 20% enrolled for a level 4 or higher qualification. The proportion that enrolled for a level 4 or higher qualification is somewhat surprising, given the group’s low level of school qualifications. We assume that those who enrolled for a level 4 or higher qualification were required to begin with courses offered at lower levels.

Nearly 30% of the students were enrolled for less than six months, and 66% were enrolled for one academic year or less. Most of the remaining students were enrolled for one to two years in total.

Of those who enrolled, 44% completed a qualification. Data on the qualifications attained are shown in Table A7. More than two-thirds (69%) of the completed qualifications were level 1–3 certificates. The remainder were largely level 4 certificates (but 3% were higher qualifications). The most common subject fields for the completed qualifications were agriculture, environmental and related; management and commerce; and food, hospitality and personal services.

Qualification completion rates are summarised in Table A8. The students who had completed NCEA level 1 before leaving school were significantly more likely to complete a tertiary qualification (54%) than those who had not (38%). Those who moved quickly from school to tertiary study were also more likely to complete a qualification than those with longer breaks between school and tertiary enrolment.

Females were slightly more likely to complete than males. There was only minor variation in completion rates across the main ethnic groups, but European students were more likely to complete than Māori or Pacific students. Students at ITPs had the same mean completion rate as students enrolled at PTEs.

Completion rates were higher than average in the following broad subject fields: architecture and building; management and commerce; society and culture; creative arts; and food, hospitality and personal services. They were particularly low in information technology (34%) and mixed field programmes (22%). The latter category covers employment and life skills programmes, some of which may not lead to formal qualifications.

4.3 Factors influencing the decision to enrol

The logistic regression models that were estimated for matching purposes provide insights into the factors that influence whether or not a poorly qualified school leaver will undertake tertiary study.

As noted above, the decision to enrol at an ITP was modelled separately from the decision to enrol at a PTE. A large number of variables and variable interactions were included in the models to enhance their predictive power. Tables A9 and A10 show the parameters estimated for a selection of the variables in the models for ITPs and PTEs respectively, focusing on the variables or groups of variables with greatest statistical significance in these models. The relative size and significance of each factor’s coefficient indicates the influence of the factor on the enrolment decision, holding other factors constant.

Nearly half of the youth who enrolled did so within three months of leaving school. The likelihood of enrolling declined with the passage of time after leaving school. Those who

left school during or immediately after year 11 were slightly more likely to go on to tertiary study than those who stayed at school for at least part of year 12 or year 13.

Region of residence was a significant predictor of enrolment. In general, those who lived in one of the main urban areas were more likely to enrol at a PTE than those who lived in secondary urban or rural areas, probably because PTEs tend to be located in the main centres.

Females were more likely than males to enrol at PTEs (but there was no significant gender difference in the likelihood of enrolment at an ITP). Pacific peoples and Asians were also more likely than Europeans to enrol at a PTE (but there was no difference in the likelihood of enrolment at an ITP).

Youth who were employed were less likely to enrol, while those with a NEET (not in education, employment or training) status were more likely to enrol. Youth with relatively high average monthly earnings (indicating they were more likely to be in full-time employment) were also less likely to start a tertiary study spell than those with lower monthly earnings.

5 Impacts of tertiary study on labour market outcomes

5.1 Labour market outcomes after studying

Figures A1–A3 plot the average employment rates, benefit rates, monthly earnings and monthly earnings conditional on employment of the students and matched comparison group members in each month before and after the tertiary study spell. The months in which the study was undertaken (and the corresponding months for the comparison group individuals) are not shown.

Figure A1 focuses on all low-qualified school leavers who enrolled in tertiary programmes (ie, our entire study population). The monthly employment rates, benefit rates and average earnings of the students and non-participants are almost identical in the three years prior to enrolment. Note that the pre-study employment, earnings and benefit profiles slope upwards with time as increasingly large fractions of the young people in the samples left school, started jobs and reached the minimum age for benefit receipt. After the end of the study spell, the students had slightly higher employment rates than the matched comparison sample. There was no real difference in their benefit receipt rates. The average monthly earnings of the students were lower initially, in the first year after study, but little different in the second year after study.

Figure A2, which plots the outcomes of the 31% of students who completed a level 1–3 certificate (but nothing higher), shows greater signs of differences in post-study outcomes. The employment rate of the students is between 5 and 9 percentage points higher than those of the non-participants, and the benefit receipt rates of the students is lower by a slightly smaller margin. Average monthly earnings are higher for the students than the non-participants, but this difference disappears when we measure earnings conditional on being employed (and exclude the non-employed).

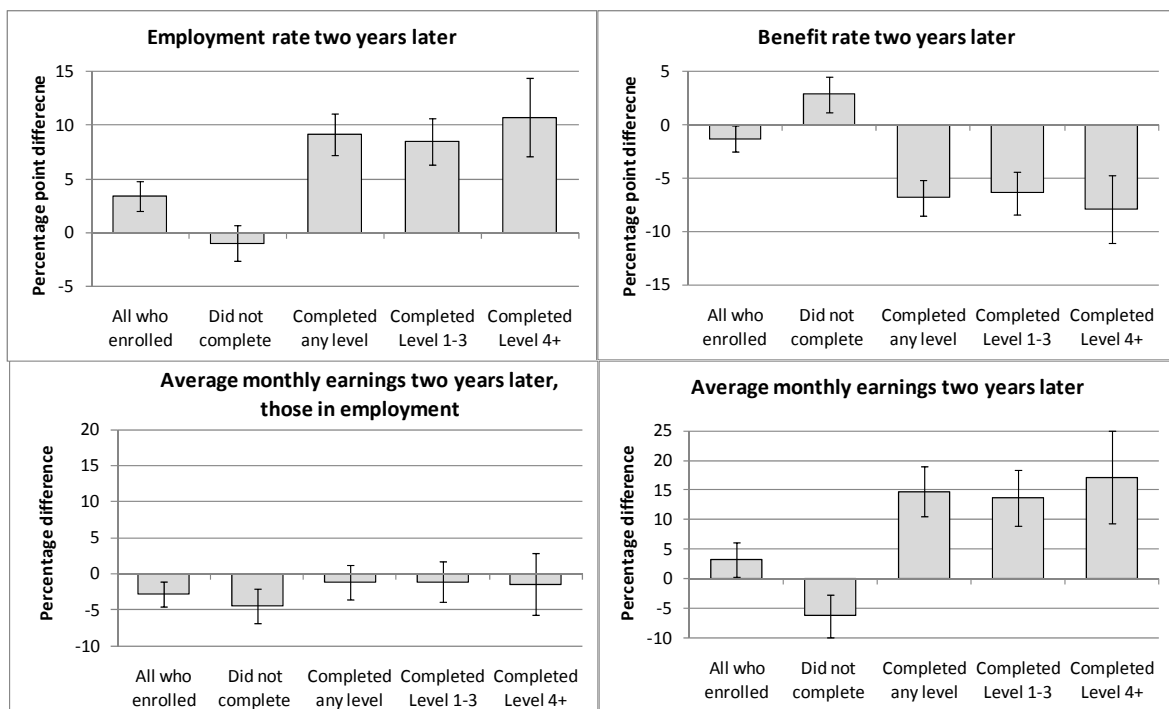
Figure A3 plots the outcomes of the 13% of students whose highest completed qualification was a level 4 certificate or higher qualification. The vertical distances between outcomes of the students and those of their matched comparisons are larger than in Figure A2, suggesting that these higher-level qualifications had somewhat larger impacts on employment rates, benefit rates and total earnings than level 1–3 certificates.

These graphs provide a good indication that there were differences in outcomes between the students and matched comparison samples but do not show whether the differences were statistically significant. The size and significance of the impacts is assessed in the next section.

5.2 Main impact estimates

Our main estimates of the impact of the tertiary study on labour market outcomes two years after the end of the study spell are summarised in Figure 2 and Table 1. The first section of Table 1 shows the impacts that were estimated for the entire study population. The second section shows the impacts experienced by the students who did not complete their programme. The remaining sections show the impacts experienced by students who completed and gained a qualification (in total and by the highest level completed). Statistically significant impacts are marked with an asterisk.

Figure 2 – Estimated impacts of tertiary study undertaken by low-qualified school leavers



Notes: Figures have been derived from the Integrated Data Infrastructure (IDI). Error bars show the 95% confidence interval.

For each outcome measure and group, we show the average values attained two years (24 months) after the study spell ended in the second and third columns of the table. For example, 58.1% of the former students and 54.7% of their matched comparisons were employed at two years after the end of the tertiary study spell, while 32% of the former

students and 33% of the matched comparisons were receiving one of the main income support benefits at that time.

The impact estimates are shown in the fourth column of the table. These represent the difference between the study group and comparison group means. The *relative* impacts (showing the impact as a percentage of the comparison group's mean employment rate, benefit rate or earnings) are shown in the final column.

The standard errors were estimated using bootstrapping methods (100 replications, sampled at the individual level prior to propensity estimation).

Table 1 – Estimated impacts of tertiary study on outcomes two years later

	Number of Students	Students	Matched comparisons	Impact	Std error	Relative impact (%)
All who enrolled						
Proportion employed	9873	0.581	0.547	0.034 *	0.007	6.2
Proportion receiving a benefit	9873	0.320	0.333	-0.013 *	0.006	-3.9
Proportion not employed or receiving a benefit	9873	0.151	0.170	-0.019 *	0.005	-11.3
Average monthly earnings	9873	1480	1434	46 *	21	3.2
Average monthly earnings when employed	9873	2550	2624	-74 *	24	-2.8
Did not complete a qualification						
Proportion employed	5586	0.522	0.532	-0.010	0.008	-1.9
Proportion receiving a benefit	5586	0.373	0.344	0.029 *	0.009	8.4
Proportion not employed or receiving a benefit	5586	0.162	0.174	-0.012	0.007	-7.1
Average monthly earnings	5586	1301	1388	-86 *	26	-6.2
Average monthly earnings when employed	5586	2494	2610	-116 *	32	-4.5
Completed a qualification						
Proportion employed	4287	0.658	0.567	0.092 *	0.010	16.2
Proportion receiving a benefit	4287	0.251	0.319	-0.068 *	0.009	-21.4
Proportion not employed or receiving a benefit	4287	0.136	0.164	-0.028 *	0.008	-17.2
Average monthly earnings	4287	1716	1496	221 *	32	14.8
Average monthly earnings when employed	4287	2608	2640	-32	32	-1.2
Completed a level 1–3 certificate						
Proportion employed	2967	0.650	0.565	0.085 *	0.011	15.0
Proportion receiving a benefit	2967	0.257	0.321	-0.064 *	0.010	-19.9
Proportion not employed or receiving a benefit	2967	0.137	0.163	-0.026 *	0.008	-16.2
Average monthly earnings	2967	1691	1487	204 *	36	13.7
Average monthly earnings when employed	2967	2604	2633	-29	38	-1.1
Completed a level 4 certificate						
Proportion employed	1320	0.678	0.571	0.108 *	0.019	18.9
Proportion receiving a benefit	1320	0.234	0.313	-0.079 *	0.016	-25.2
Proportion not employed or receiving a benefit	1320	0.133	0.166	-0.032	0.015	-19.5
Average monthly earnings	1320	1776	1516	260 *	60	17.2
Average monthly earnings when employed	1320	2618	2655	-38	57	-1.4

Notes: * Indicates that the impact estimate is statistically significant at the 95% confidence level. The numbers of students have been randomly rounded to base 3. Earnings were converted to December 2013 values. Proportions and averages were calculated excluding those who were overseas two years after the end of the study spell. Figures have been derived from the Integrated Data Infrastructure (IDI).

All who enrolled

Looking at the top row of Table 1, we can see that the employment rate of all the low-qualified school leavers who enrolled in tertiary programmes was 3.4 percentage points (6%) higher than the employment rate of the matched comparisons, two years after finishing or withdrawing from tertiary study. The benefit receipt rate was 1.3 percentage points (3.9%) lower. The proportion who were not employed and not receiving benefits was 1.9 percentage points (11%) lower, indicating a decline in inactivity rates.

The average monthly earnings of the low-qualified school leavers who enrolled in tertiary programmes were 3.2% higher than that of their matched comparisons. This earnings measure incorporates income from employment in all months, including months without paid work, and therefore captures the direct effects of differences in employment rates on earnings. An alternative measure of earnings, shown in the following row, calculates average monthly earnings in the months when some paid work was undertaken. On this measure, the students' earnings were 2.8% lower than those of their matched comparisons.

Non-completers

The second section of Table 1 gives our impact estimates for the students who enrolled but failed to complete a qualification (56% of the total). The estimated effects of tertiary study were null or negative for this group of young people. There was no significant change in their employment rate. They were more likely to be in receipt of a benefit two years after they ceased studying (by 2.9 percentage points or 8.4%). Their average monthly earnings were 6.2% lower than those of their matched comparisons. Their average monthly earnings, conditional on employment, were also lower by 4.5%.

Completers

Our estimates of the impacts experienced by students who completed a qualification are given in the remaining sections of the table. On average, those who completed a qualification were 9.2 percentage points (16.2%) more likely to be employed two years after finishing study and 6.8 percentage points (21.4%) less likely to be on benefit. Their average total monthly earnings were around 15% higher (capturing the effect of higher employment). However, their average earnings during months of employment were not significantly different from those of the matched comparison group.

Completing a level 1–3 certificate was associated with an 8.5 percentage point (15.0%) increase in the employment rate, a 6.4 percentage point (19.9%) decrease in the benefit receipt rate and a 13.7% increase in average monthly earnings. Completing a level 4 certificate or higher qualification was associated with a 10.8 percentage point (18.9%) increase in the employment rate, a 7.9 percentage point (25.2%) decrease in the benefit receipt rate and a 17.2% increase in average monthly earnings. The impacts associated with level 4 qualifications are consistently larger than for level 1–3 certificates, although the pattern of impacts is similar.

Summary

The main results suggest that tertiary study is beneficial for low-qualified school leavers who complete a qualification but of little value (or even costly) for those who do not.

For those who complete a qualification, the improvements in the likelihood of being employed are reasonably substantial and are accompanied by reductions in the likelihood of receiving income support. Total earnings are higher.

Our results also indicate that the positive impacts of tertiary study on monthly earnings are due to higher employment rates rather than increases in individuals' *levels* of earnings. When we calculate average monthly earnings in the months in which at least some employment was undertaken, all of the estimated impacts of tertiary study are insignificant or negative, suggesting wage rates and weekly hours of work were generally not increased by tertiary study. One possible reason is that a high proportion of the teenagers in our study population were employed in jobs that paid all workers the minimum wage. This would have limited the scope for positive wage impacts.

The impacts of completing a qualification are examined in greater detail in the following sections, looking at the benefits that were gained by different types of students who completed their programme. We focus on the employment rate and benefit rate impacts in this analysis and do not report more detailed results for earnings, due to the evidence that the beneficial effects of tertiary education for low-qualified youth come mainly or entirely through improvements in the likelihood of getting a job. Estimates of the average impacts of studying for all students who enrolled, for a range of different demographic groups and tertiary programmes, are set out in Tables A11 and A12 for reference purposes.

5.3 Subpopulation impacts for students who completed a level 1–3 certificate

Tables A13 and A14 give our estimates of the impacts of completing a level 1–3 qualification on the employment rates and benefit receipt rates of subgroups within the low-qualified school leaver population.

5.3.1 Employment rates

Completing a level 1–3 qualification had positive effects on the employment rates of both men and women. However, the employment impacts were larger for women than for men and larger for European than for Māori or Pacific students. European females who completed qualifications were 14.4 percentage points (27%) more likely to be employed two years after finishing study. European males, Māori males and Māori females were between 5 and 7 percentage points (10–15%) more likely to be employed than their matched comparisons.

There was little difference in the absolute size of the employment impacts between students who completed NCEA level 1 before leaving school and students who did not, but in relative terms, the lowest-achieving school leavers experienced a greater increase in their employment rate.

The time gap between the end of school and the start of the tertiary study provides an indicator of whether an individual may have left school with the intention of continuing their

education through post-school study as an alternative to staying at school. Students who leave school in order to enrol with tertiary providers may be positively selected and more capable on average than students who leave school without any further study intentions who only enrol after a period of unsuccessful job search. To test this hypothesis, in Table A13, we show how employment outcomes and the size of the employment impacts differed by the time gap between the date of leaving school and the date of enrolling.

On average, the students who moved directly from school to a tertiary institution (enrolling within three months) had higher mean employment rates than students who enrolled after a break of four months or longer. This would be expected if the former group were 'positively selected' and more capable on average. However, there was little difference in the size of the employment rate increases gained by students who moved directly from school to a tertiary institution compared with having longer breaks. If anything, the impact size was slightly larger for students who were out of the educational system for 18 months or longer.

When we compared employment impacts for students at the two main types of institution, we found that those who studied at a private training provider improved their subsequent employment rates by more than those who studied at a polytechnic or institute of technology (11 percentage points or 23%, compared with 7.3 percentage points or 12%). The reasons for this difference in impacts are not known but may include differences in the types of qualifications obtained or in the unmeasured characteristics of the average student.

The size of the employment impacts associated with completing a level 1–3 qualification also varied by broad field of study. Certificates in engineering and related technologies; management and commerce; and food, hospitality and personal services were associated with the largest employment rate increases. Certificates in information technology; architecture and building; and agriculture, environmental and related studies were associated with small and statistically insignificant employment impacts. In health and creative arts, the estimated impacts were somewhat larger but still insignificant due in part to smaller sample sizes.

Differences in the mix of qualifications obtained by students of different gender and ethnicity probably contributed to the demographic patterns reported above. Females were more likely than males to complete qualifications in management and commerce; and in food, hospitality and personal services (as shown in Table A8), and these fields were associated with larger than average employment impacts.

5.3.2 Benefit receipt rates

Table A14 gives estimates of the impact of completing a level 1–3 certificate on the likelihood of receiving a benefit two years afterwards for various groups of students.

The pattern of impacts on benefit rates is similar to the pattern of impacts on employment rates, with European females experiencing substantially larger benefit rate reductions than European or Māori males or Māori females. European females who completed qualifications were 13.5 percentage points (35%) less likely to be receiving one of the main benefits two years after finishing study. European males, Māori males and Māori females were between 3 and 6 percentage points (6–23%) less likely to be receiving benefit income.

The young people who enrolled more than four months after leaving school were more likely to be on a benefit two years after study than those who moved directly from school to tertiary providers. However, our impact estimates show that the reduction in their post-study benefit rate associated with the completion of a level 1–3 certificate was of similar magnitude to the reduction typically experienced by students who moved from school to tertiary study more rapidly.

5.4 Subpopulation impacts for students who completed a level 4 certificate

Tables A15 and A16 give our estimates of the impacts of completing a level 4 or higher qualification on the employment rates and benefit receipt rates of different subgroups of students.

The majority of these qualifications were level 4 certificates. For brevity, we refer to them all as level 4 certificates in this section.

5.4.1 Employment rates

For this level of qualification, we found evidence of significant employment effects for both males and females and both Europeans and Māori but not Pacific peoples or other ethnic groups. European and Māori females benefited more from completing a level 4 qualification than the other ethnic and gender subgroups. European females were 18.6 percentage points (33%) more likely to be employed two years after finishing study, while Māori females were 15.9 percentage points (46%) more likely to be employed. European and Māori males were 6–8 percentage points (10–11%) more likely to be employed than their matched comparisons.

Completing a level 4 certificate was associated with larger employment improvements for students who left school without any qualifications than for those who had attained NCEA level 1. Similarly, completing a level 4 certificate had a larger employment rate impact for the students who did not enrol in tertiary education in the first few months after leaving school than for those who enrolled more quickly. Although these groups had lower average employment rates two years after completing their qualification, the positive impact of the post-school education was larger in both absolute and relative terms.

Students who completed a level 4 certificate at a private training provider improved their subsequent employment rates by more than those who studied at a polytechnic or institute of technology – 11.9 percentage points (23%) compared with 9.9 percentage points (16%).

Qualifications in architecture and building; management and commerce; society and culture; food, hospitality and personal services; and mixed field programmes were associated with significant positive employment impacts. In other fields, the employment impacts were mainly positive but not statistically significant, in part, because of smaller sample sizes.

5.4.2 Benefit receipt rates

The gender and ethnic group estimates in Table A16 indicate that completing a level 4 certificate was associated with large reductions in the benefit receipt rates of both European women and Māori women. There was also a significant, but smaller, reduction in the benefit rate of European men.

Looking at the impacts by subject field, only two broad subject fields showed benefit rate reductions that were large enough to be statistically significant (given the numbers of students in the sample): management and commerce; and food, hospitality and personal services.

5.5 Factors influencing qualification completion rates

In this section, we briefly discuss available evidence on factors that influence the post-school education completion rates of low-achieving school leavers.

Simple completion rate statistics for our study population were given in Table A8. We noted that students who had completed NCEA level 1 before leaving school were significantly more likely to complete their tertiary study than students without any school qualifications. Females were more likely to complete than males, and Europeans more likely to complete than Māori. Completion rates were substantially higher than average in some fields of study (such as architecture and building; and creative arts) and lower than average in other fields (such as information technology).

Taking all members of the study population, we estimated a logistic regression model to identify the relative size and significance of different explanatory variables in influencing the likelihood of completion, controlling for the effects of other factors. Those regression estimates also showed large variations in the likelihood of completion across fields of study, with the interaction between field of study and type of institution also very significant. Students enrolling in mixed field programmes; information technology; and engineering and related technologies were less likely to gain a qualification. Students enrolling in agriculture, environmental and related studies; architecture and building; creative arts; food, hospitality and personal services; and society and culture were more likely to do so.

Those who initially enrolled in a qualification that required fewer than 0.25 EFTS were more likely to complete a qualification. Students who had gained NCEA level 1 were much more likely to complete a qualification as were those who started studying around two to three months after leaving school without a more extended gap. Females were slightly more likely to complete a qualification than males. Ethnicity was not a significant factor in the multivariate model. There were substantial regional variations in completion rates, but these did not follow any obvious pattern and could have been influenced by a wide range of factors such as regional variations in the mix or quality of the qualifications offered by providers, student characteristics and alternative labour market opportunities.

The international literature on low-qualified school leavers indicates that poor learning skills, special learning needs such as dyslexia, drug and alcohol dependency, mental health problems, financial difficulties and housing difficulties can be important barriers to learning for disadvantaged youth (Chowdry *et al*, 2009; Crawford *et al*, 2011; National Institute of Adult Continuing Education, 2013). These barriers to learning often persist

beyond school and make it more difficult for teenagers who have not succeeded in school to succeed in post-school programmes.

In the Wellington-based Competent Learners study, a longitudinal study of a representative sample of youth, a high proportion of those who left school without formal qualifications started a tertiary course before the age of 20 but left without completing it (Wylie and Hodgen, 2011, p51). The reasons given for not finishing a course included finding the course too difficult and not doing well in it, losing interest, not finding the content or teaching enjoyable and personal reasons.

The literature suggests that youth who have achieved poorly in school do not necessarily have the ability to sustain and complete post-school study programmes without extra support.

6 Conclusion

6.1 Summary of findings

This paper has estimated the labour market benefits that are gained by low-qualified school leavers who attempt to improve their qualifications fairly soon after leaving school by enrolling in post-school certificate programmes.

The paper offers evidence that young people who leave school without completing an NCEA level 2 certificate can materially improve their employment prospects by enrolling in tertiary education programmes – but only if they complete a qualification. We estimate that around 20% of all low-qualified school leavers in the 1990–92 birth cohorts had completed a tertiary qualification by their 20th birthday, and 5–6% had gained a level 4 certificate or higher.

For those who achieved a qualification, the employment rate impacts after two years ranged from small to substantial, depending on student characteristics and the level and type of qualification obtained. These employment increases were also associated with significant reductions in the likelihood of receiving income support. However, there was no evidence of increases in students' levels of earnings, conditional on being in paid work. This suggests that, on average, wage rates and/or weekly hours of work were not boosted by the completion of a qualification.

Completing a level 1–3 certificate was associated with an 8.5 percentage point increase in the employment rate, a 6.4 percentage point decrease in the benefit receipt rate and a 14% increase in total monthly earnings. Completing a level 4 certificate or higher qualification was associated with a 10.8 percentage point increase in the employment rate, a 7.9 percentage point decrease in the benefit receipt rate and a 17% increase in total monthly earnings.

Completing a tertiary qualification had positive effects on the employment rates of both men and women and both European and Māori students. However, the estimated employment impacts were larger for women than for men and largest for European women.

Students who had not achieved any qualifications before leaving school were less likely to complete a tertiary qualification than those who had achieved NCEA level 1, and if they did complete, they were substantially less likely to be employed two years after the end of their tertiary study spell. Despite these continuing disadvantages, the employment impacts associated with completing a tertiary qualification were larger for these students than for the NCEA level 1 achievers, suggesting that tertiary education may be more beneficial for the lower-achieving group if they manage to complete a qualification.¹¹

There were substantial variations in the size of the employment impacts associated with different fields of study. Considering level 1–3 certificates, qualifications in engineering and related technologies; management and commerce; and food, hospitality and personal services were associated with the largest employment rate increases (more than 10 percentage points). Qualifications in information technology; architecture and building; and agriculture, environmental and related studies were associated with small and statistically insignificant employment impacts. At level 4 and higher, qualifications in architecture and building; management and commerce; society and culture; food, hospitality and personal services; and mixed field programmes were all associated with significant positive employment impacts. In all other fields, the impacts were small or imprecisely identified.

We were not able to establish the reasons for the differences in impacts that we observed between males and females, different ethnic groups and different fields of study among the students who completed a qualification. There may have been interactions between the effects of personal characteristics and the effects of course characteristics. For example, a higher rate of enrolment in food, hospitality and personal services programmes may have helped boost the post-study employment rates of females relative to males. On the other hand, it is also possible that the gender and ethnic mix found in different qualifications influenced the variations in employment impacts across fields.

The paper focused on outcomes measured two years after the end of the study spell because three-year outcomes could only be observed for a minority of students. Two years is a relatively short follow-up period, and it is possible that the benefits of completing a level 1–3 qualification could increase further with time. However, the impacts we measured appeared to be fairly constant in level during the first three years of the follow-up period rather than increasing as time passed. This suggests the employment rate and income support effects of the qualifications obtained would not necessarily be any larger after five years.

Some of the students in our study population completed their qualifications during the Global Financial Crisis. Job opportunities at that time may have been more favourable for young women than young men or stronger in the food, hospitality and personal services industries than in other industries. The pattern of employment impacts across broad subject fields may have been influenced by the labour market conditions of the time and would not necessarily be the same in a different time period.

¹¹ An alternative explanation for this result is that the unqualified school leavers who successfully completed a tertiary qualification were positively selected on unmeasured characteristics and would have done better even without the tertiary study.

6.2 Limitations of the study

Uncontrolled selection effects may be affecting our estimates and causing them to be upwardly biased. The students in this study were matched to non-participants using an extensive range of variables, but we cannot rule out the possibility that some part of the employment benefits we estimate was due to positive selection on unobserved characteristics such as learning skills, motivation and self-confidence rather than the effects of the education undertaken. In other words, the students who successfully completed a tertiary qualification may have had better employment outcomes than non-participants even if they had not studied. A conservative view would treat our results as likely upper bound estimates of the true impacts of tertiary study at this level for poorly qualified school leavers.

The range of explanatory variables used to match students with ‘similar’ non-students could be extended in future, using additional datasets that have been included in the Integrated Data Infrastructure more recently or will be included in future. For example, measures of truancy from school could be used as a proxy measure of disengagement from the learning process. Ideally, students should be matched with non-students who have similar attitudes towards learning. Including a greater range of variables would reduce the scope for biases from uncontrolled selection effects.

Another limitation of the labour market impact estimates presented in this paper is that they do not cover the low-qualified school leavers in the 1990–92 birth cohorts who were still studying at tertiary institutions in 2011 or 2012 (about 46% of all low-qualified school leavers who enrolled in level 1–4 programmes in the period up to 2012). This group includes some people who will have progressed on to higher levels of study, so it seems likely that this group of individuals may ultimately experience greater benefits from tertiary education than those in our main study population. This group also includes students who started studying at slightly older ages, and greater maturity may lead to higher completion rates. The extent to which they achieved better outcomes in practice could be considered in later research when the necessary follow-up data are available.

6.3 Discussion of implications

The average impact of the tertiary education that is undertaken by low-qualified school leavers represents the net effect of the positive impacts gained by completers combined with the lack of benefits experienced by non-completers. If fewer than half of those who enrol complete a qualification, this significantly reduces the average benefit per student.

On average, the students in our study population experienced a post-study increase in their average monthly earnings of \$46 (measured in December 2013 dollar values), or 3.2%, as a result of their higher employment rate. The improvement in employment rates that followed completion was fairly constant in level in the two to three year follow-up period rather than increasing through time.

From a public policy viewpoint, it is unclear whether the benefits flowing from the education undertaken by the low-qualified school leavers in our study population would have exceeded the costs of their education. In principle, the public benefits of higher education include the (net present) value of the individual’s increased earnings, higher taxes paid and reduced need for income support over their lifetime. In practice, the magnitude of the benefits gained will be strongly influenced by whether or not the modest increases in total earnings that were apparent in the first two years after course

completion are sustained over the students' lifetimes. The costs of the tertiary study include the public expenditure on the institutions and programmes, the value of student allowances received and the value of student loans taken out (which may be written off by the government if the loanholders' earnings do not meet the minimum threshold for repayments).

Policies that either encourage more realistic enrolment decisions for this group of youth or raise their course completion rates (perhaps by providing more in-programme support) have the potential to improve the average benefits of the tertiary education that is undertaken, but care is needed in assessing the likely improvement in benefits that will be gained. If unobserved differences in ability are playing some role in generating the pattern of impacts reported here, students who are provided with additional support to help them complete qualifications will not necessarily achieve outcomes as good as those currently achieved by more able students.

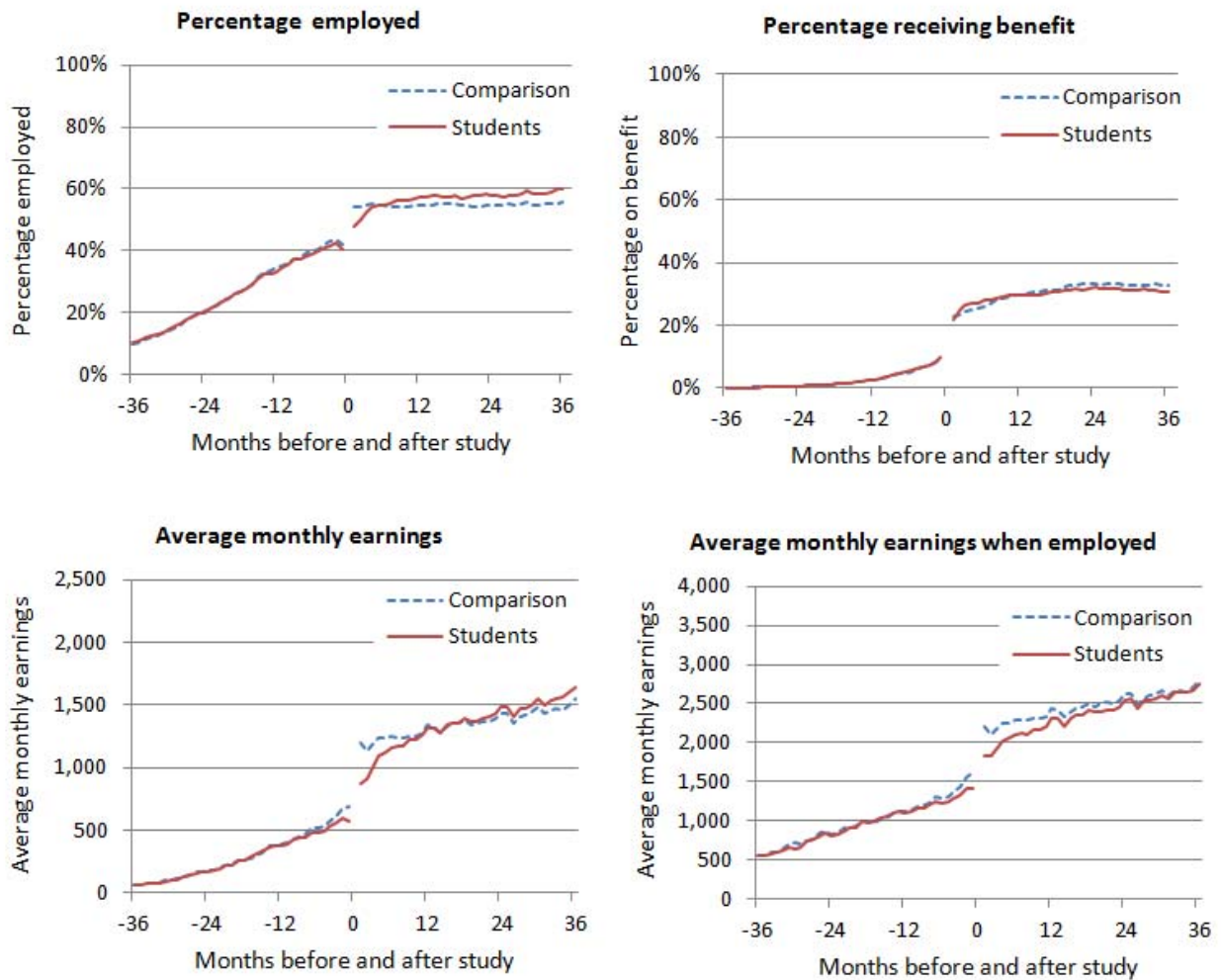
Policies that raise achievement in schools and lower the proportion who become disengaged from learning and leave school without NCEA level 2 could provide a more effective alternative method of improving the labour market outcomes of this group of youth. However, no evidence is currently available on the labour market outcomes that are likely to be achieved by youth who are at risk of leaving school early, if they are supported to stay in school and do achieve NCEA certificates at level 1 and level 2. That is a different research question, and it is likely to require a wider set of data than the administrative sources used in the current study.

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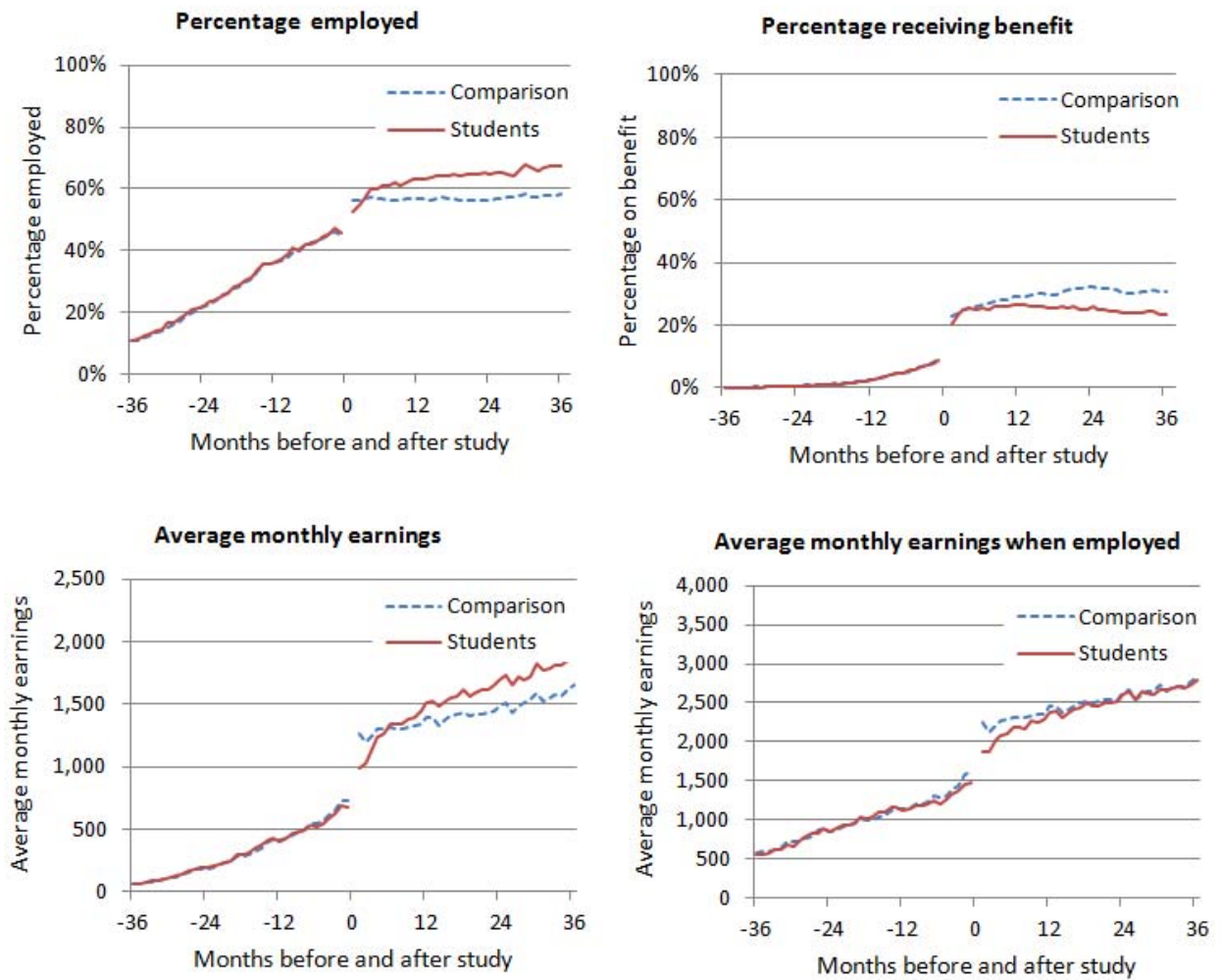
Appendix

Figure A1 – Outcomes of all low-qualified school leavers who enrolled and their matched comparison groups



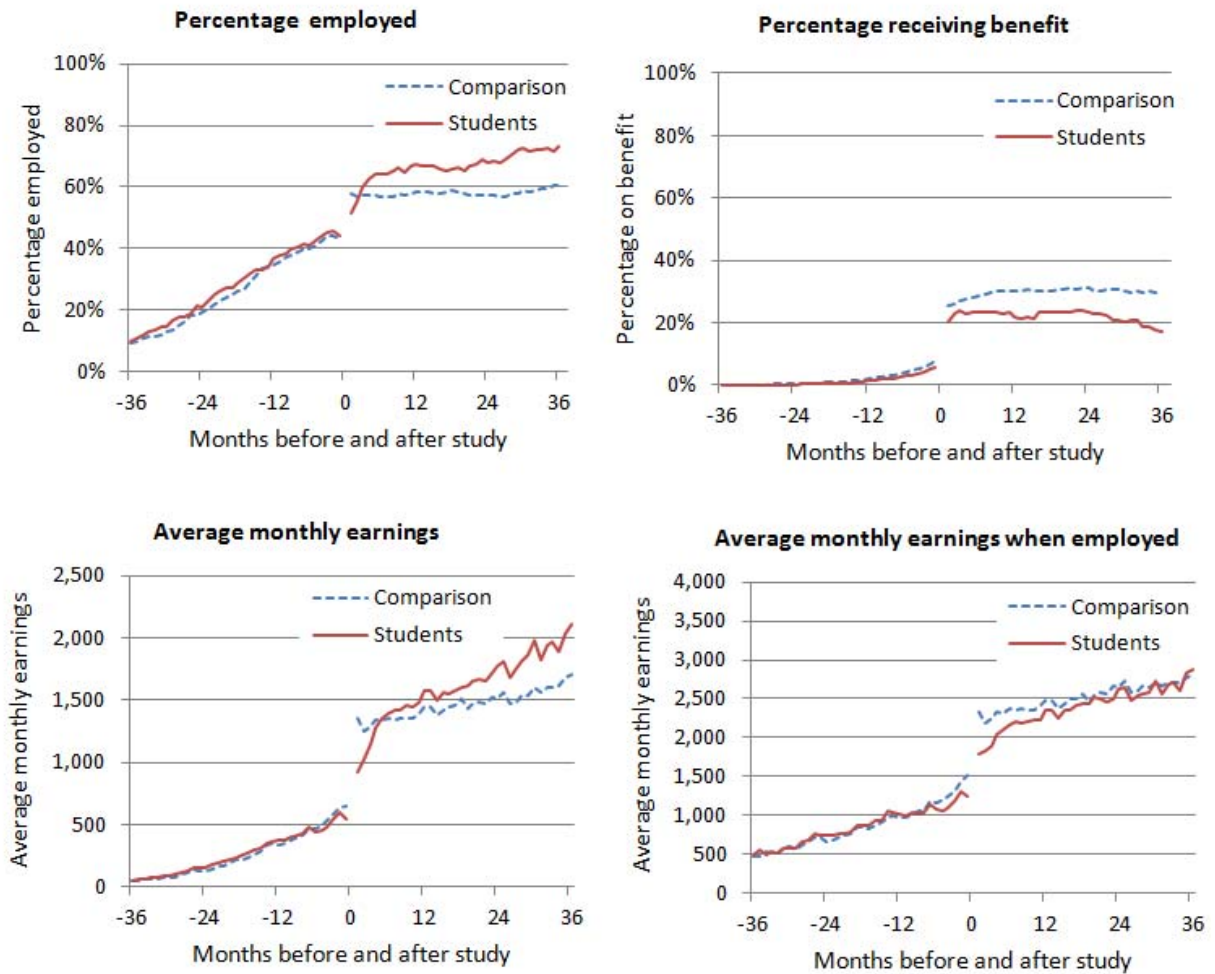
Notes: Figures have been derived from the Integrated Data Infrastructure (IDI) managed by Statistics New Zealand.

Figure A2 – Outcomes of low-qualified school leavers who completed a level 1–3 certificate and their matched comparison groups



Notes: Figures have been derived from the Integrated Data Infrastructure (IDI) managed by Statistics New Zealand.

Figure A3 – Outcomes of low-qualified school leavers who completed a level 4 certificate and their matched comparison groups



Notes: Figures have been derived from the Integrated Data Infrastructure (IDI) managed by Statistics New Zealand.

Table A1 – Tertiary enrolment and completion rates for all low-qualified school leavers

Birth cohort (Year 11 at school)	1990-91 2006	1991-92 2007	1992-93 2008	1993-94 2009	1994-95 2010
Total birth cohort*	59,358	60,042	60,138	59,226	59,304
Attended NCEA only schools	56,229	56,826	56,910	55,977	56,037
Number attended NCEA only schools who left school without NCEA level 2	20,220	19,491	17,742	14,799	13,590
Percentage of those who attended NCEA only schools who left school without NCEA level 2	36.0	34.3	31.2	26.4	24.3
No qualification	23.3	21.8	19.8	17.2	15.8
NCEA Level 1	12.7	12.5	11.4	9.2	8.4
Outcomes of youth who left school without NCEA level 2					
Proportion who enrolled in tertiary education by...					
Age 17 (before turning 18)	17.3	16.3	15.3	14.8	13.4
Age 18	30.2	30.4	29.7	28.4	
Age 19	41.8	41.5	40.5		
Age 20	48.9	48.1			
Age 21	53.1				
Proportion who completed a tertiary qualification by..					
Age 17 (before turning 18)	3.1	3.1	3.1	3.2	2.9
Age 18	8.3	8.9	8.9	8.6	
Age 19	13.9	14.9	14.7		
Age 20	19.5	20.4			
Age 21	23.9				
Proportion who completed a Level 4 qualification by....					
Age 17 (before turning 18)	0.4	0.4	0.4	0.3	0.4
Age 18	1.9	2.0	1.6	1.5	
Age 19	3.8	3.7	3.1		
Age 20	5.7	5.6			
Age 21	7.3				

Notes:

*The population is restricted to students who were enrolled at school in year 11 and matched to IR. This means the total cohort numbers are lower than those reported in official statistics published by the Ministry of Education.

Counts have been randomly rounded to base 3.

Figures have been derived from the Integrated Data Infrastructure (IDI) managed by Statistics NZ.

Table A2 – Variables included in the propensity score models

Variable	Categories
Demographic characteristics	
Birth cohort	1990/91 (born between July 1990 and June 1991), 1991/92 (born between July 1991 and June 1992)
Gender	Female, Male
Ethnicity	Māori, NZ European, Pacific, Other (includes Asian, Middle Eastern, African and other ethnic groups), Missing
Characteristics of the last school attended	
Region	Northland, Auckland, Waikato, Bay of Plenty, Gisborne, Hawke's Bay, Taranaki, Manawatu-Wanganui, Wellington, West Coast, Canterbury, Otago, Southland, Tasman, Nelson, Marlborough, Correspondence School
Main urban area	Yes, No
School decile	11 categories (Decile 1 to 10, missing)
State integrated school	Yes, No
Co-educational school	Yes, No
Secondary school attainment	
Highest secondary school qualification attained	No credits achieved, Some credits achieved but did not gain Level 1 qualification, Level 1 qualification
Last schooling year	4 categories (Year 11, Year 12, Year 13, stayed on beyond Year 13)
Total credits gained all levels	No credits, 4 quantiles
Credits gained at Level 1	
Total credits gained in English	No credits, 4 quantiles
Total credits gained in Mathematics	No credits, 4 quantiles
Total credits gained in Physical education and health	No credits, 4 quantiles
Total credits gained in Science	No credits, 4 quantiles
Total credits gained in Social studies	No credits, 4 quantiles
Total credits gained in Technology	No credits, 4 quantiles
Total credits gained in Arts	No credits, 4 quantiles
Credits gained at Level 2 or above	
Total credits gained in English	None, 1 or more credits
Total credits gained in Mathematics	None, 1 or more credits
Total credits gained in Physical education and health	None, 1 or more credits
Total credits gained in Science	None, 1 or more credits
Total credits gained in Social studies	None, 1 or more credits
Total credits gained in Technology	None, 1 or more credits
Total credits gained in Arts	None, 1 or more credits
Proportion of externally assessed achievement standards	None, 4 quantiles
Proportion of internally assessed unit standards	None, 4 quantiles
Activity, employment and benefit history prior to enrolment	
Break between secondary school and tertiary enrolment (or reference month for non-participants)	13 categories (no break, 1-3 months, 4-6 months, 7-9 months, 10-12 months, 13-15 months, 16-18 months, 19-21 months, 22-24 months, 25-27 months, 28-30 months, 31-33 months, 34 months and longer)
Receiving a benefit in the month prior to the reference month	Yes, No
Employed in the month prior to the reference month	Yes, No
Not in education, employment and training	Yes, No
Overseas	Yes, No
Months received benefit in the previous 6 months	Number of months (none, 1-3 months, 4-6 months)
Months received benefit in the previous 7-12 months	Number of months (none, 1-3 months, 4-6 months)
Months received benefit in the previous 13-18 months	Number of months (none, 1-3 months, 4-6 months)
Months received wages and salaries in the previous 6 months	Number of months (none, 1-3 months, 4-6 months)
Months received wages and salaries in the previous 7-12 months	Number of months (none, 1-3 months, 4-6 months)
Months received wages and salaries in the previous 13-18 months	Number of months (none, 1-3 months, 4-6 months)
Months not in education, employment and training in the previous 6 months	Number of months (none, 1-3 months, 4-6 months)
Months not in education, employment and training in the previous 7-12 months	Number of months (none, 1-3 months, 4-6 months)
Months not in education, employment and training in the previous 13-18 months	Number of months (none, 1-3 months, 4-6 months)
Months overseas in the previous 6 months	Number of months (none, 1-3 months, 4-6 months)
Months overseas in the previous 7-12 months	Number of months (none, 1-3 months, 4-6 months)
Months overseas in the previous 13-18 months	Number of months (none, 1-3 months, 4-6 months)
Average monthly gross income from wages and salaries (conditional on being employed) in the previous 18 months	None, \$1-<\$500, \$500-<\$1000, \$1000-<\$1500, \$1501-<\$2000, \$2001-<\$2500, \$2501 and above

Table A3 – Percentage of students who were matched to a comparison group

	Total		ITP ¹ match rate		PTE ² match rate	
	Number	Match rate	Number	Match rate	Number	Match rate
Number of students	10,890	91	6,969	92	3,921	89
Demographic characteristics						
Male	6,372	92	4,521	92	1,848	91
Female	4,518	89	2,448	90	2,070	87
European	4,944	94	3,441	94	1,503	94
Māori	4,281	93	2,610	94	1,671	92
Pacific Islander	984	80	444	81	543	79
Other ethnic groups	681	63	474	69	204	51
Highest school qualification						
None	6,903	92	4,035	94	2,865	91
Level 1	3,987	88	2,931	89	1,056	84
Last year at school						
Year 11	4,194	91	2,436	92	1,755	89
Year 12	4,812	93	3,189	94	1,626	92
Year 13	1,881	84	1,344	85	540	81
Total number of NCEA credits achieved at all levels						
Quantile 1	2,058	95	1,101	96	960	93
Quantile 2	2,334	93	1,515	93	822	92
Quantile 3	2,469	89	1,758	90	711	85
Quantile 4	2,244	86	1,668	87	576	83
None	1,782	91	930	94	852	88
Number of months between leaving school and the reference month						
No break or 1-3 months	5,079	87	3,168	89	1,914	85
4-<18 months	3,831	93	2,409	93	1,419	92
18 months or more	1,977	95	1,389	95	588	93
Benefit receipt in the previous 18 months						
None	9,591	90	6,099	91	3,492	88
1-6 months	810	93	522	93	288	93
7-12 months	297	95	207	94	90	93
13 or more months	189	95	138	93	48	100
Employment in the previous 18 months						
None	3,300	89	1,797	91	1,500	88
1-6 months	3,027	90	1,875	91	1,152	88
7-12 months	2,151	91	1,452	92	699	90
13 or more months	2,406	93	1,839	93	567	93

Notes: Counts have been randomly rounded to base 3.

¹ ITP = Institute of technology, polytech, wananga or university. ² PTE = Private training provider.

Figures have been derived from the Integrated Data Infrastructure (IDI) managed by Statistics NZ.

Table A4 –Characteristics of participants and non-participants

	Students					Non-Participants
	Total	Male	Female	ITP ¹	PTE ²	
Number of observations	10890	6372	4518	6969	3921	17688
	<i>Percentages</i>					
Demographic characteristics						
Sex						
Male	58.5	100.0	0.0	64.9	47.2	61.7
Female	41.5	0.0	100.0	35.1	52.9	38.3
Ethnicity						
European	45.4	47.4	42.5	49.4	38.3	41.1
Māori	39.3	37.2	42.3	37.5	42.6	31.6
Pacific peoples	9.0	8.5	9.8	6.3	13.8	8.0
Other or missing ethnicity	6.3	6.8	5.5	6.8	5.2	19.3
Sex and ethnicity						
European male	27.7	47.4	0.0	33.2	18.1	26.7
Māori male	21.8	37.2	0.0	22.9	19.7	18.2
European female	17.6	0.0	42.5	16.2	20.2	14.4
Māori female	17.5	0.0	42.2	14.5	22.9	13.4
Characteristics of the last school attended						
School decile						
Decile 1-3	26.5	25.2	28.3	23.3	32.2	26.2
Decile 4-7	48.5	48.6	48.4	51.1	43.9	48.7
Decile 8-10	20.8	22.7	18.3	21.2	20.1	19.0
Decile is missing	4.2	3.5	5.2	4.4	3.7	6.1
Location						
Main urban area	67.3	66.6	68.3	62.6	75.7	64.8
Secondary and minor urban area	25.3	26.6	23.5	29.4	18.0	25.6
Rural	2.8	3.0	2.6	3.1	2.2	3.6
Unknown/missing	4.6	3.8	5.7	4.8	4.2	6.1
School attainment						
Highest school qualification						
None	63.4	63.6	63.1	57.9	73.1	64.1
Level 1	36.6	36.5	36.8	42.1	26.9	36.0
Number of credits gained in all subjects at level 1						
No credits	16.6	17.0	15.9	13.6	21.9	16.5
1-40 credits	27.3	27.4	27.1	24.7	32.1	28.4
41-80 credits	33.0	34.2	31.3	35.1	29.3	32.0
More than 40 credits	23.1	21.3	25.6	26.7	16.7	23.1
Number of credits gained in all subjects at level 2						
No credits	48.0	47.2	49.0	43.2	56.5	46.5
1-40 credits	45.4	46.6	43.8	49.0	38.9	46.0
More than 40 credits	6.6	6.1	7.2	7.7	4.6	7.4
Average credits gained (all subjects and levels)	63	63	63	69	51	63
Average credits gained (all subjects and levels) for those who gained credits	70	69	72	75	62	73

Notes: Counts have been randomly rounded to base 3. s = suppressed for confidentiality reasons.

¹ ITP = Institute of technology, polytech, wananga or university. ² PTE = Private training provider.

Figures have been derived from the Integrated Data Infrastructure (IDI) managed by Statistics NZ.

Table A5 – Prior activity of students and non-participants

	Students					Non-participants ³
	Total	Male	Female	ITP ¹	PTE ²	
Number of observations	10890	6372	4518	6969	3921	60000
Last year at school						
Year 11	38.5	39.4	37.2	35.0	44.8	42.2
Year 12	44.2	43.9	44.6	45.7	41.4	42.8
Year 13	17.3	16.6	18.3	19.3	13.8	15.0
Number of months between leaving school and enrolment ⁴						
None	16.0	17.1	14.3	14.2	19.1	3.3
1-3 months	30.7	31.7	29.3	31.2	29.7	8.9
4-6 months	9.8	9.2	10.6	8.1	12.6	8.8
7-12 months	15.5	14.4	16.9	16.1	14.2	17.1
13-18 months	11.2	10.9	11.7	11.5	10.6	15.6
More than 18 months	16.9	16.7	17.2	18.7	13.6	46.4
Benefit receipt in the 18 months before enrolment ⁴						
None	88.1	90.1	85.3	87.5	89.1	77.4
1-6 months	7.5	6.4	9.0	7.5	7.3	11.0
7-12 months	2.7	2.3	3.3	3.0	2.3	6.0
13 or more months	1.7	1.2	2.4	2.0	1.2	5.6
Employment in the 18 months before enrolment ⁴						
None	30.3	28.6	32.7	25.8	38.3	21.4
1-6 months	27.8	29.0	26.0	26.9	29.4	21.8
7-12 months	19.8	19.7	19.9	20.8	17.9	19.1
13 or more months	22.1	22.6	21.3	26.4	14.5	37.7
Average monthly earnings in the 18 months before enrolment ⁴						
Less than \$500	19.6	17.9	22.0	19.2	20.4	8.8
\$501-\$1000	22.4	21.5	23.6	22.5	22.2	13.9
\$1001-\$1500	12.2	12.9	11.3	13.6	9.8	13.9
\$1501-\$2000	7.7	8.8	6.3	9.0	5.6	14.4
\$2001-\$2500	4.3	5.5	2.7	5.3	2.4	13.7
\$2501 and above	3.4	4.8	1.4	4.5	1.4	14.0
Overseas in the 18 months before enrolment ⁴						
	3.1	3.1	3.1	3.0	3.4	2.5

Notes: Counts have been randomly rounded to base 3. Earnings are in \$ Dec 2013 values.

Figures have been derived from the Integrated Data Infrastructure (IDI) managed by Statistics NZ.

¹ ITP = Institute of technology, polytech, wananga or university. ² PTE = Private training provider.

³ The prior activities of the students are measured at the time of their first tertiary enrolment. The prior activities of each non-participant can be observed in every month from January 2006 to December 2010. We generated records for each non-participant in each month, and took a random sample of 60,000. This is the basis for our non-participant profile.

⁴ For non-participants, results are shown for the 18 months before the reference month.

Table A6 – Enrolment profile of students

	Students				
	Total	Male	Female	ITP ¹	PTE ²
Number of observations	10890	6372	4518	6969	3921
	<i>Percentages</i>				
Type of tertiary institution					
University or college of education	1.1	0.8	1.5	1.7	0.0
Institute of technology or polytechnic	59.4	67.2	48.3	92.7	0.0
Wananga	3.6	3.0	4.4	5.6	0.0
Private training establishment	35.0	27.8	45.2	0.0	97.2
Other tertiary education providers	1.0	1.2	0.7	0.0	2.8
Level of first programme					
Level 1-3 certificate	80.2	80.0	80.5	77.7	84.9
Level 4 certificate	19.7	20.0	19.5	22.3	15.1
Field of study					
Natural and physical sciences	0.3	0.1	0.5	0.4	0.0
Information technology	4.5	3.8	5.6	5.1	3.6
Engineering and related technologies	17.0	27.4	2.3	23.0	6.4
Architecture and building	6.8	11.2	0.6	8.9	3.0
Agriculture, environmental and related studies	11.8	16.8	4.8	14.8	6.5
Health	2.2	1.4	3.4	3.1	0.5
Education	0.3	0.1	0.4	0.3	0.2
Management and commerce	13.0	6.3	22.5	12.7	13.5
Society and culture	5.8	4.4	7.8	5.8	5.8
Creative arts	2.9	2.4	3.7	3.2	2.4
Food, hospitality and personal services	14.6	5.7	27.1	11.9	19.3
Mixed field programmes	20.7	20.3	21.2	10.5	38.7
Number of EFTS enrolled for					
Less than 0.25	10.8	13.2	7.5	16.0	1.7
0.25 -< 0.50	8.8	8.8	9.0	9.9	7.0
0.50 -<1.0	25.3	24.6	26.4	27.6	21.4
1.0 -< 2.0	44.0	43.8	44.2	39.8	51.3
2.0 or more	11.0	9.7	12.9	6.8	18.6
Average number of EFTS enrolled for	1.0	1.0	1.1	0.9	1.3
Median number of EFTS enrolled for	1.0	1.0	1.0	0.9	1.0
Total time enrolled					
Less than 3 months	9.2	11.6	6.0	11.0	6.1
3 -< 6 months	18.4	18.4	18.3	23.1	9.9
6 -< 12 months	40.2	41.4	38.4	38.5	43.1
12 -< 24 months	26.1	23.2	30.3	22.5	32.7
24 months or more	6.1	5.4	7.0	4.9	8.2

Notes: Counts have been randomly rounded to base 3.

¹ ITP = Institute of technology, polytech, wananga or university. ² PTE = Private training provider. Figures have been derived from the Integrated Data Infrastructure (IDI) managed by Statistics NZ.

Table A7 – Profile of qualifications completed

	Total		ITP ¹ completion rate		PTE ² completion rate	
	Number	Completion rate	Number	Completion rate	Number	Completion rate
Total	10,890	44	6,966	44	3,921	44
Sex						
Male	6,372	42	4,521	44	1,848	38
Female	4,518	46	2,445	43	2,070	49
Ethnicity						
European	4,941	45	3,441	45	1,503	45
Māori	4,281	41	2,610	42	1,671	40
Pacific peoples	984	43	441	38	543	48
Sex and ethnicity						
European male	3,024	44	2,310	45	711	38
Māori male	2,370	41	1,599	43	771	35
European female	1,920	48	1,128	46	792	51
Māori female	1,908	42	1,011	40	900	44
Highest secondary school qualification						
None	6,900	38	4,035	39	2,865	37
Level 1	3,984	54	2,931	50	1,053	62
Field of study						
Natural and physical sciences	33	18	30	20	s	s
Information technology	498	34	357	25	141	57
Engineering and related technologies	1,854	45	1,605	43	249	60
Architecture and building	738	53	621	50	117	72
Agriculture, environmental and related	1,287	51	1,032	52	255	45
Health	240	50	219	49	21	57
Education	30	20	21	29	9	s
Management and commerce	1,419	51	888	44	528	64
Society and culture	630	46	402	39	231	58
Creative arts	318	49	222	45	96	63
Food, hospitality and personal services	1,590	56	831	49	759	63
Mixed field programmes	2,256	22	735	33	1,518	17
EFTS enrolled over study period						
Less than 0.25	1,176	21	1,110	22	63	s
0.25 -< 0.50	960	33	687	34	273	29
0.50 -<1.0	2,757	40	1,920	37	840	46
1.0 -< 2.0	4,788	50	2,775	54	2,016	45
2.0-<3.0	1,011	56	429	71	582	45
3.0 or more	192	55	45	80	147	47
Time between school and tertiary enrolment						
Less than 4 months	5,079	46	3,168	49	1,911	41
4-<18 months	3,969	42	2,493	40	1,473	45
18 months or more	1,842	41	1,305	38	534	48

Notes: Counts have been randomly rounded to base 3. s = suppressed for confidentiality reasons.

¹ ITP = Institute of technology, polytech, wananga or university. ² PTE = Private training provider.

Figures have been derived from the Integrated Data Infrastructure (IDI) managed by Statistics NZ.

Table A8 – Qualification completion rates

	Students				
	Total	Male	Female	ITP ¹	PTE ²
Number of students	10890	6372	4518	6969	3921
Number who completed a qualification	4746	2679	2067	3036	1710
Qualification completion rate	43.6	42.0	45.8	43.6	43.6
Level of highest qualification					
Certificate level 1-3	68.7	70.9	65.7	73.4	60.2
Certificate level 4	28.2	26.9	29.8	23.7	36.1
Certificate/diploma level 5-7	3.0	2.1	4.4	2.7	3.7
Bachelor's degree	0.1	s	0.3	0.2	s
Field of study (highest qualification)					
Natural and physical sciences	0.3	0.1	0.6	0.5	s
Information technology	2.5	2.7	2.3	2.6	2.3
Engineering and related technologies	18.6	30.0	4.1	22.4	11.9
Architecture and building	10.1	17.6	0.3	12.3	6.1
Agriculture, environmental and related studies	12.8	19.1	4.5	15.7	7.5
Health	2.8	1.8	3.9	3.4	1.8
Education	0.6	0.1	1.2	0.5	0.7
Management and commerce	15.6	6.6	27.3	11.8	22.5
Society and culture	7.0	6.2	7.8	5.7	8.9
Creative arts	4.0	3.8	4.1	3.9	4.2
Food, hospitality and personal services	21.5	8.4	38.5	15.4	32.3
Mixed field programmes	4.4	3.6	5.5	5.7	2.1
Number of EFTS complete (all qualifications)					
Less than 0.25	5.1	7.3	2.3	8.0	s
0.25 -< 0.50	6.6	7.1	6.1	7.7	4.6
0.50 -<1.0	23.3	24.0	22.6	23.7	22.8
1.0 -< 2.0	50.8	49.9	52.0	49.4	53.3
2.0 or more	14.2	11.9	17.1	11.3	19.5
Average number of EFTS completed	1.2	1.1	1.3	1.1	1.4
Median number of EFTS completed	1.0	1.0	1.0	1.0	1.1

Notes: Counts have been randomly rounded to base 3. s = suppressed for confidentiality reasons.

Figures have been derived from the Integrated Data Infrastructure (IDI) managed by Statistics NZ.

¹ ITP = Institute of technology, polytech, wananga or university. ² PTE = Private training provider.

Table A9 – Selected parameters from the propensity score model for enrolment at ITPs

Characteristic (Reference category)	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq	Odds ratio	
Intercept	1.927	0.361	28.6	<.0001		
Ethnicity (NZ European)	Māori	0.044	0.058	0.6	0.442	
	Pacific Islander	0.181	0.109	2.7	0.099	
	Asian	0.705	0.190	13.7	0.000	
	Middle Eastern/African	0.603	0.243	6.1	0.013	
	Other ethnic groups	0.080	0.120	0.4	0.505	
Sex (Female)	Male	0.055	0.053	1.1	0.305	
School qualification (Level 1)	No school qualification	-0.049	0.084	0.3	0.560	
Ethnicity (NZ European)*School qualification (Level 1)	Māori * No school qualification	0.096	0.069	1.9	0.164	
	Pacific * No school qualification	-0.320	0.129	6.2	0.013	
	Asian * No school qualification	-0.158	0.253	0.4	0.533	
	Middle Eastern/African * No school qualification	0.302	0.306	1.0	0.324	
	Other * None	0.177	0.167	1.1	0.289	
Sex (Female) * School qualification (Level 1)	Male * No school qualification	0.000	0.000	0.0	0.000	
Co-ed school	Co-ed school	-0.220	0.044	25.3	<.0001	0.803
State integrated school	State integrated school	0.024	0.067	0.1	0.726	1.024
School decile (Decile 1)	Decile 2	-0.121	0.077	2.4	0.118	0.886
	Decile 3	-0.099	0.083	1.4	0.233	0.906
	Decile 4	-0.164	0.077	4.5	0.034	0.849
	Decile 5	-0.074	0.076	1.0	0.328	0.928
	Decile 6	-0.191	0.076	6.3	0.012	0.826
	Decile 7	-0.034	0.084	0.2	0.689	0.967
	Decile 8	0.180	0.081	5.0	0.026	1.197
	Decile 9	-0.080	0.092	0.8	0.385	0.923
	Decile 10	-0.140	0.112	1.6	0.208	0.869
Region (Auckland)	Northland	0.369	0.080	21.5	<.0001	1.446
	Waikato	0.193	0.061	10.0	0.002	1.213
	Bay Of Plenty	0.757	0.067	126.2	<.0001	2.131
	Gisborne	0.336	0.130	6.7	0.010	1.399
	Hawke's Bay	0.239	0.083	8.4	0.004	1.270
	Taranaki	-0.056	0.093	0.4	0.547	0.945
	Manawatu-Wanganui	0.315	0.071	19.7	<.0001	1.370
	Wellington	0.173	0.063	7.5	0.006	1.189
	West Coast	0.956	0.129	55.3	<.0001	2.600
	Canterbury	0.310	0.060	27.0	<.0001	1.364
	Otago	0.273	0.081	11.5	0.001	1.314
	Southland	0.401	0.087	21.0	<.0001	1.493
	Tasman	0.174	0.152	1.3	0.252	1.190
	Nelson	0.180	0.138	1.7	0.194	1.197
Marlborough	-0.416	0.178	5.4	0.020	0.660	
Location (Rural, secondary or minor urban area)	Main urban area	-0.044	0.039	1.3	0.250	0.957
Cohort (Born July 1991-June 1992)	Born 1990-91	-0.093	0.031	8.9	0.003	0.911
Last year enrolled at school (Year 11)	Year 12	-0.103	0.038	7.2	0.007	0.902
	Year 13	-0.260	0.057	20.7	<.0001	0.771
Break between school and tertiary education (No break)	Less that 3 months	-0.611	0.068	80.0	<.0001	0.543
	4-6 months	-1.971	0.083	558.0	<.0001	0.139
	7-9 months	-1.527	0.085	322.2	<.0001	0.217
	10-12 months	-2.032	0.092	483.3	<.0001	0.131
	13-15 months	-1.733	0.091	365.1	<.0001	0.177
	16-18 months	-2.394	0.098	598.2	<.0001	0.091
	19-21 months	-2.192	0.095	533.7	<.0001	0.112
	22-24 months	-2.527	0.102	613.8	<.0001	0.080
	25-27 months	-2.210	0.102	471.7	<.0001	0.110
	28-30 months	-2.891	0.122	559.2	<.0001	0.056
	31-33 months	-2.603	0.118	483.5	<.0001	0.074
34 or more months	-3.138	0.109	825.1	<.0001	0.043	

Table A9 continued – Selected parameters from the propensity model for enrolment at ITPs

Characteristic (Reference category)		Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq	Odds ratio
Not employed or at school in the month prior to enrolment		0.479	0.082	34.3	<.0001	1.614
Employed in the month prior to enrolment		-0.117	0.079	2.2	0.140	0.889
Receiving benefit in the month prior to enrolment		-0.275	0.114	5.8	0.016	0.760
Overseas in the month prior to enrolment		0.523	0.146	12.9	0.000	1.687
Months not employed or at school during the 6 months prior to enrolment (4-6 months)	No months	-0.582	0.078	55.1	<.0001	0.559
	1-3 months	-0.251	0.057	19.4	<.0001	0.778
Months employed during the 6 months prior to enrolment	No months	-0.519	0.080	42.1	<.0001	0.595
	1-3 months	-0.225	0.056	16.4	<.0001	0.798
Months on benefit during the 6 months prior to enrolment	No months	-0.115	0.140	0.7	0.410	0.891
	1-3 months	0.118	0.096	1.5	0.218	1.125
Months overseas during the 6 months prior to enrolment	No months	-0.941	0.184	26.2	<.0001	0.390
	1-3 months	-0.776	0.178	19.0	<.0001	0.460
Months not employed or at school during the 7-12 months prior to enrolment (4-6 months)	No months	0.158	0.056	8.1	0.005	1.171
	1-3 months	-0.373	0.052	52.4	<.0001	0.688
Months employed during the 7-12 months prior to enrolment (4-6 months)	No months	0.294	0.121	5.9	0.015	1.342
	1-3 months	0.181	0.122	2.2	0.137	1.199
Months receiving benefit during the 7-12 months prior to enrolment (4-6 months)	No months	-0.070	0.062	1.3	0.259	0.933
	1-3 months	0.062	0.054	1.3	0.248	1.064
Months overseas during the 7-12 months prior to enrolment (4-6 months)	No months	-0.458	0.164	7.8	0.005	0.633
	1-3 months	-0.270	0.165	2.7	0.102	0.763
Months not employed or at school during the 13-18 months prior to enrolment (4-6 months)	No months	-0.428	0.061	49.2	<.0001	0.652
	1-3 months	-0.219	0.050	19.2	<.0001	0.803
Months employed during the 13-18 months prior to enrolment (4-6 months)	No months	0.179	0.130	1.9	0.168	1.196
	1-3 months	0.011	0.150	0.0	0.940	1.011
Months receiving benefit during the 13-18 months prior to enrolment (4-6 months)	No months	-0.365	0.064	32.9	<.0001	0.694
	1-3 months	-0.134	0.054	6.1	0.014	0.875
Months overseas during the 13-18 months prior to enrolment (4-6 months)	No months	-0.601	0.162	13.8	0.000	0.548
	1-3 months	-0.445	0.164	7.3	0.007	0.641
Average monthly gross earnings from wages and salaries during the 18 months prior to	No earnings	0.715	0.099	52.2	<.0001	2.043
	Less than \$500	0.824	0.084	96.2	<.0001	2.279
	\$501-\$1000	0.647	0.078	68.3	<.0001	1.910
	\$1001-\$1500	0.510	0.077	43.6	<.0001	1.665
	\$1501-\$2000	0.340	0.078	19.1	<.0001	1.405

Notes: The model also included total number of NCEA credits (not significant), the number of NCEA level 1 credits obtained in each subject area (significant), the number of NCEA level 2 credits obtained in each subject area (not significant), the proportion of externally assessed achievement standards (not significant) and the proportion of internally assessed unit standards (not significant).

Table A10 – Selected parameters from the propensity model for enrolment at PTEs

Characteristic (Reference category)	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq	Odds ratio
Intercept	0.697	0.481	2.1	0.1469	
Ethnicity (NZ European)					
Māori	0.269	0.088	9.3	0.002	
Pacific Islander	0.754	0.133	32.4	<.0001	
Asian	1.215	0.244	24.8	<.0001	
Middle Eastern/African	0.675	0.361	3.5	0.061	
Other ethnic groups	-0.245	0.212	1.3	0.246	
Sex (Female)					
Male	-0.862	0.079	119.0	<.0001	
School qualification (Level 1)					
No school qualification	0.066	0.114	0.3	0.560	
Ethnicity (NZ European)*School qualification (Level 1)					
Māori * No school qualification	-0.063	0.100	0.4	0.530	
Pacific * No school qualification	-0.428	0.147	8.4	0.004	
Asian * No school qualification	-1.509	0.344	19.2	<.0001	
Middle Eastern/African *					
No school qualification	-0.032	0.431	0.0	0.941	
Other * None	0.377	0.263	2.1	0.151	
Sex (Female) * School qualification (Level 1)					
Male * No school qualification	0.320	0.090	12.8	0.000	
Co-ed school					
Co-ed school	-0.052	0.062	0.7	0.405	0.950
State integrated school					
State integrated school	0.001	0.096	0.0	0.996	1.001
School decile (Decile 1)					
Decile 2	0.100	0.088	1.3	0.258	1.105
Decile 3	0.227	0.095	5.7	0.017	1.254
Decile 4	0.214	0.091	5.6	0.018	1.239
Decile 5	-0.054	0.094	0.3	0.566	0.947
Decile 6	0.084	0.093	0.8	0.368	1.088
Decile 7	-0.067	0.105	0.4	0.521	0.935
Decile 8	0.194	0.102	3.6	0.057	1.215
Decile 9	0.375	0.105	12.7	0.000	1.455
Decile 10	0.236	0.134	3.1	0.078	1.266
Region (Auckland)					
Northland	0.104	0.099	1.1	0.294	1.109
Waikato	-0.314	0.073	18.5	<.0001	0.730
Bay Of Plenty	-0.675	0.107	40.2	<.0001	0.509
Gisborne	-0.392	0.154	6.5	0.011	0.676
Hawke's Bay	-0.447	0.108	17.1	<.0001	0.639
Taranaki	-0.351	0.123	8.1	0.004	0.704
Manawatu-Wanganui	-0.267	0.092	8.5	0.004	0.765
Wellington	-0.538	0.080	45.9	<.0001	0.584
West Coast	-0.868	0.272	10.1	0.001	0.420
Canterbury	-0.270	0.073	13.9	0.000	0.763
Otago	-1.247	0.150	69.6	<.0001	0.287
Southland	-2.249	0.258	76.1	<.0001	0.105
Tasman	-0.840	0.243	11.9	0.001	0.432
Nelson	-0.903	0.215	17.7	<.0001	0.406
Marlborough	-2.486	0.520	22.8	<.0001	0.083
Location (Rural, secondary or minor urban area)					
Main urban area	0.441	0.055	64.6	<.0001	1.554
Cohort (Born July 1991-June 1992)					
Born 1990-91	-0.238	0.041	34.4	<.0001	0.789
Last year enrolled at school (Year 11)					
Year 12	-0.252	0.050	25.8	<.0001	0.777
Year 13	-0.705	0.079	78.8	<.0001	0.494
Break between school and tertiary education (No break)					
Less than 3 months	-0.733	0.077	90.8	<.0001	0.481
4-6 months	-1.673	0.096	302.6	<.0001	0.188
7-9 months	-1.811	0.106	294.7	<.0001	0.163
10-12 months	-2.120	0.117	331.0	<.0001	0.120
13-15 months	-1.851	0.113	268.0	<.0001	0.157
16-18 months	-2.467	0.121	419.1	<.0001	0.085
19-21 months	-2.719	0.129	446.7	<.0001	0.066
22-24 months	-2.725	0.134	411.5	<.0001	0.066
25-27 months	-2.485	0.134	344.0	<.0001	0.083
28-30 months	-3.082	0.159	375.3	<.0001	0.046
31-33 months	-3.052	0.169	324.5	<.0001	0.047
34 or more months	-3.652	0.150	594.3	<.0001	0.026

Table A10 continued – Selected parameters from the propensity model for enrolment at PTEs

		Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq	Odds ratio
Not employed or at school in the month prior to enrolment		-0.103	0.092	1.2	0.264	0.902
Employed in the month prior to enrolment		-0.775	0.092	71.3	<.0001	0.461
Receiving benefit in the month prior to enrolment		-0.247	0.165	2.2	0.136	0.781
Overseas in the month prior to enrolment		0.273	0.169	2.6	0.108	1.313
Months not employed or at school during the 6 months prior to enrolment (4-6 months)	No months	-0.720	0.102	50.0	<.0001	0.487
	1-3 months	-0.294	0.070	17.6	<.0001	0.746
Months employed during the 6 months prior to enrolment	No months	-0.330	0.101	10.6	0.001	0.719
	1-3 months	-0.119	0.074	2.6	0.107	0.888
Months on benefit during the 6 months prior to enrolment	No months	0.219	0.203	1.2	0.281	1.245
	1-3 months	0.373	0.133	7.9	0.005	1.451
Months overseas during the 6 months prior to enrolment	No months	-1.031	0.213	23.4	<.0001	0.357
	1-3 months	-0.966	0.207	21.8	<.0001	0.380
Months not employed or at school during the 7-12 months prior to enrolment (4-6 months)	No months	0.251	0.070	12.8	0.000	1.285
	1-3 months	-0.260	0.064	16.5	<.0001	0.771
Months employed during the 7-12 months prior to enrolment (4-6 months)	No months	0.122	0.174	0.5	0.482	1.130
	1-3 months	0.094	0.179	0.3	0.600	1.098
Months receiving benefit during the 7-12 months prior to enrolment (4-6 months)	No months	-0.107	0.080	1.8	0.181	0.898
	1-3 months	0.073	0.071	1.1	0.304	1.076
Months overseas during the 7-12 months prior to enrolment (4-6 months)	No months	-0.066	0.207	0.1	0.751	0.936
	1-3 months	0.082	0.209	0.2	0.694	1.086
Months not employed or at school during the 13-18 months prior to enrolment (4-6 months)	No months	-0.450	0.082	29.9	<.0001	0.637
	1-3 months	-0.241	0.064	14.3	0.000	0.786
Months employed during the 13-18 months prior to enrolment (4-6 months)	No months	0.723	0.205	12.4	0.000	2.060
	1-3 months	0.286	0.241	1.4	0.235	1.331
Months receiving benefit during the 13-18 months prior to enrolment (4-6 months)	No months	-0.157	0.085	3.4	0.065	0.855
	1-3 months	-0.076	0.077	1.0	0.325	0.927
Months overseas during the 13-18 months prior to enrolment (4-6 months)	No months	-0.383	0.207	3.4	0.064	0.682
	1-3 months	-0.139	0.209	0.4	0.505	0.870
Average monthly gross earnings from wages and salaries during the 18 months prior to enrolment	No earnings	1.165	0.171	46.6	<.0001	3.207
	Less than \$500	1.422	0.158	81.1	<.0001	4.145
	\$501-\$1000	1.339	0.153	76.3	<.0001	3.816
	\$1001-\$1500	1.028	0.155	43.9	<.0001	2.797
	\$1501-\$2000	0.770	0.159	23.3	<.0001	2.159
	\$2001-\$2500	0.342	0.175	3.8	0.051	1.407
Model diagnostics						
Number observations		33920				
Number enrolled at ITPs		3920				
Log likelihood ratio (DF)		6279.3 (153)				

Notes: The model also included total number of NCEA credits (not significant), the number of NCEA credits obtained in each subject area by level (not significant), the proportion of externally assessed achievement standards (not significant) and the proportion of internally assessed unit standards (not significant).

Table A11 – Estimated impact of enrolment on the employment rate two years later

	Number of students	Proportion employed				
		Students	Matched comparisons	Impact	Standard Error	Relative impact (%)
Total	9,873	0.581	0.547	0.034 *	0.007	6.2
Sex						
Male	5,862	0.651	0.634	0.017 *	0.008	2.7
Female	4,008	0.475	0.419	0.056 *	0.012	13.4
Ethnicity						
European	4,647	0.678	0.636	0.041 *	0.010	6.5
Māori	4,002	0.465	0.439	0.027 *	0.011	6.1
Other ethnic	432	0.713	0.690	0.023	0.040	3.4
Pacific Islander	792	0.505	0.471	0.034	0.030	7.2
Sex and ethnicity						
European male	2,871	0.723	0.710	0.013	0.011	1.8
Māori male	2,223	0.552	0.529	0.022	0.014	4.2
European female	1,776	0.601	0.518	0.083 *	0.017	16.1
Māori female	1,782	0.356	0.325	0.031 *	0.017	9.5
Highest school qualification						
None	6,375	0.497	0.468	0.029 *	0.009	6.2
Level 1	3,495	0.739	0.694	0.045 *	0.012	6.4
Type of tertiary institution						
ITP or polytechnic	6,384	0.621	0.586	0.034 *	0.008	5.9
Private training establishment	3,489	0.507	0.474	0.034 *	0.012	7.1
Field of study						
Natural and physical sciences	30	0.583	0.613	-0.030	0.117	-4.9
Information technology	468	0.450	0.488	-0.038	0.028	-7.8
Engineering and related technologies	1,743	0.725	0.671	0.054 *	0.013	8.1
Architecture and building	699	0.708	0.658	0.050 *	0.021	7.7
Agriculture, environmental and related studies	1,161	0.586	0.585	0.001	0.017	0.2
Health	216	0.608	0.534	0.073	0.042	13.7
Education	27	0.560	0.485	0.075	0.110	15.6
Management and commerce	1,221	0.495	0.472	0.022	0.018	4.7
Society and culture	561	0.561	0.486	0.075 *	0.028	15.4
Creative arts	285	0.576	0.581	-0.005	0.038	-0.8
Food, hospitality and personal services	1,431	0.594	0.492	0.102 *	0.018	20.7
Mixed field programmes	2,025	0.480	0.488	-0.008	0.014	-1.7

Notes:

* indicates that the impact estimate is statistically significant at the 95% confidence level.

The numbers of students have been randomly rounded to base 3. s = suppressed for confidentiality reasons.

Proportions and averages have been calculated excluding those who were overseas two years after study.

Earnings have been converted to December 2013 dollar values.

Figures have been derived from the Integrated Data Infrastructure (IDI) managed by Statistics NZ.

Table A12 – Estimated impact of enrolment on benefit receipt two years later

	Number of students	Proportion receiving benefit				
		Students	Matched comparisons	Impact	Standard Error	Relative impact (%)
Total	9,873	0.320	0.333	-0.013 *	0.006	-3.9
Sex						
Male	5,862	0.229	0.220	0.009	0.007	4.0
Female	4,008	0.457	0.499	-0.042 *	0.011	-8.4
Ethnicity						
European	4,644	0.251	0.268	-0.017 *	0.009	-6.2
Māori	4,005	0.416	0.424	-0.008	0.011	-1.9
Other ethnic	435	0.205	0.182	0.023	0.036	12.5
Pacific Islander	792	0.311	0.354	-0.042	0.030	-12.0
Sex and ethnicity						
European male	2,871	0.193	0.179	0.014	0.010	8.1
Māori male	2,220	0.291	0.291	0.000	0.013	-0.1
European female	1,773	0.349	0.411	-0.062 *	0.017	-15.2
Māori female	1,782	0.573	0.590	-0.016	0.017	-2.7
Highest school qualification						
None	6,375	0.389	0.399	-0.010	0.008	-2.5
Level 1	3,495	0.189	0.209	-0.020	0.010	-9.5
Type of tertiary institution						
ITP or polytechnic	6,384	0.279	0.300	-0.022 *	0.007	-7.2
Private training establishment	3,489	0.395	0.393	0.002	0.011	0.5
Field of study						
Natural and physical sciences	30	0.375	0.306	0.069	0.119	22.5
Information technology	468	0.460	0.401	0.059 *	0.028	14.8
Engineering and related technologies	1,743	0.182	0.206	-0.025 *	0.012	-11.9
Architecture and building	699	0.176	0.213	-0.037	0.018	-17.5
Agriculture, environmental and related studies	1,161	0.273	0.276	-0.004	0.016	-1.4
Health	219	0.290	0.367	-0.077	0.043	-20.9
Education	30	0.240	0.424	-0.184 *	0.090	-43.4
Management and commerce	1,221	0.414	0.422	-0.008	0.018	-2.0
Society and culture	561	0.341	0.394	-0.053 *	0.027	-13.3
Creative arts	285	0.304	0.329	-0.025	0.034	-7.5
Food, hospitality and personal services	1,434	0.351	0.408	-0.057 *	0.017	-14.0
Mixed field programmes	2,025	0.412	0.375	0.037 *	0.014	9.8

Notes:

* indicates that the impact estimate is statistically significant at the 95% confidence level.

The numbers of students have been randomly rounded to base 3. s = suppressed for confidentiality reasons.

Proportions and averages have been calculated excluding those who were overseas two years after study.

Earnings have been converted to December 2013 dollar values.

Figures have been derived from the Integrated Data Infrastructure (IDI) managed by Statistics NZ.

Table A13 – Estimated impact of completing a level 1-3 certificate on the employment rate two years later

	Number of students	Proportion employed				
		Students	Matched comparisons	Impact	Standard error	Relative impact (%)
Total	2,967	0.650	0.565	0.085 *	0.011	15.0
Sex						
Male	1,758	0.723	0.653	0.070 *	0.012	10.7
Female	1,203	0.541	0.435	0.106 *	0.019	24.3
Ethnicity						
European	1,476	0.752	0.655	0.098 *	0.015	14.9
Māori	1,167	0.515	0.450	0.064 *	0.019	14.3
Other ethnic	132	0.789	0.685	0.103	0.069	15.0
Pacific Islander	189	0.544	0.466	0.078	0.057	16.8
Sex and ethnicity						
European male	921	0.794	0.725	0.069 *	0.017	9.6
Māori male	645	0.614	0.541	0.073 *	0.024	13.4
European female	555	0.683	0.539	0.144 *	0.026	26.8
Māori female	519	0.390	0.338	0.052 *	0.029	15.4
Highest school qualification						
None	1,737	0.549	0.469	0.080 *	0.015	17.1
Level 1	1,227	0.793	0.703	0.090 *	0.017	12.7
Time between school and tertiary enrolment						
Less than 4 months	1,320	0.707	0.618	0.088 *	0.017	14.3
4-<18 months	1,065	0.605	0.530	0.075 *	0.018	14.1
18 months or more	579	0.602	0.503	0.098 *	0.025	19.5
Type of tertiary institution						
ITP or polytechnic	2,055	0.679	0.605	0.073 *	0.012	12.1
Private training establishment	909	0.582	0.472	0.110 *	0.022	23.4
Field of highest qualification completed						
Natural and physical sciences	s	s	s	s	s	s
Information technology	102	0.489	0.465	0.025	0.059	5.3
Engineering and related technologies	678	0.828	0.694	0.134 *	0.018	19.3
Architecture and building	147	0.691	0.661	0.030	0.048	4.6
Agriculture, environmental and related studies	501	0.636	0.613	0.023	0.026	3.7
Health	69	0.610	0.513	0.097	0.072	18.9
Education	s	s	s	s	s	s
Management and commerce	387	0.543	0.439	0.103 *	0.032	23.5
Society and culture	192	0.527	0.476	0.052	0.049	10.8
Creative arts	78	0.662	0.581	0.081	0.070	13.9
Food, hospitality and personal services	498	0.632	0.495	0.137 *	0.029	27.6
Mixed field programmes	303	0.543	0.513	0.030	0.035	5.8

Notes:

* indicates that the impact estimate is statistically significant at the 95% confidence level.

The numbers of students have been randomly rounded to base 3. s = suppressed for confidentiality reasons.

Proportions and averages have been calculated excluding those who were overseas two years after study.

Earnings have been converted to December 2013 dollar values.

Figures have been derived from the Integrated Data Infrastructure (IDI) managed by Statistics NZ.

Table A14 – Estimated impact of completing a level 1-3 certificate on the rate of benefit receipt two years later

	Number of students	Proportion receiving benefit				
		Students	Matched comparisons	Impact	Standard error	Relative impact (%)
Total	2,967	0.257	0.321	-0.064 *	0.010	-19.9
Sex						
Male	1,758	0.167	0.208	-0.041 *	0.012	-19.5
Female	1,203	0.391	0.488	-0.096 *	0.019	-19.8
Ethnicity						
European	1,476	0.176	0.251	-0.075 *	0.013	-29.9
Māori	1,167	0.376	0.425	-0.049 *	0.019	-11.6
Other ethnic	132	0.122	0.155	-0.033	0.056	-21.1
Pacific Islander	189	0.285	0.358	-0.073	0.055	-20.4
Sex and ethnicity						
European male	921	0.128	0.167	-0.038 *	0.015	-23.0
Māori male	645	0.231	0.289	-0.058 *	0.022	-20.0
European female	555	0.254	0.390	-0.135 *	0.025	-34.7
Māori female	519	0.560	0.595	-0.035	0.030	-5.9
Highest school qualification						
None	1,737	0.345	0.406	-0.060 *	0.014	-14.9
Level 1	1,227	0.132	0.199	-0.067 *	0.015	-33.7
Time between school and tertiary enrolment						
Less than 4 months	1,320	0.212	0.281	-0.069 *	0.015	-24.5
4-<18 months	1,065	0.296	0.348	-0.052 *	0.017	-15.0
18 months or more	579	0.290	0.366	-0.076 *	0.024	-20.7
Type of tertiary institution						
ITP or polytechnic	2,055	0.220	0.286	-0.066 *	0.011	-23.1
Private training establishment	909	0.345	0.403	-0.058 *	0.020	-14.3
Field of highest qualification completed						
Natural and physical sciences	s	s	s	s	s	s
Information technology	102	0.394	0.427	-0.033	0.057	-7.8
Engineering and related technologies	678	0.106	0.188	-0.082 *	0.016	-43.5
Architecture and building	147	0.147	0.214	-0.067	0.041	-31.3
Agriculture, environmental and related studies	501	0.222	0.271	-0.049	0.024	-18.0
Health	69	0.220	0.383	-0.163 *	0.067	-42.5
Education	s	s	s	s	s	s
Management and commerce	387	0.386	0.449	-0.062	0.031	-13.9
Society and culture	192	0.376	0.370	0.006	0.045	1.6
Creative arts	78	0.262	0.342	-0.080	0.068	-23.4
Food, hospitality and personal services	498	0.313	0.409	-0.097 *	0.030	-23.6
Mixed field programmes	303	0.355	0.370	-0.014	0.035	-3.9

Notes:

* indicates that the impact estimate is statistically significant at the 95% confidence level.

The numbers of students have been randomly rounded to base 3. s = suppressed for confidentiality reasons.

Proportions and averages have been calculated excluding those who were overseas two years after study.

Earnings have been converted to December 2013 dollar values.

Figures have been derived from the Integrated Data Infrastructure (IDI) managed by Statistics NZ.

Table A15 – Estimated impact of completing a level 4 certificate on the employment rate two years later

	Number of students	Proportion employed				
		Students	Matched comparisons	Impact	Standard error	Relative impact (%)
Total	1,320	0.678	0.571	0.108 *	0.019	18.9
Sex						
Male	711	0.724	0.664	0.060 *	0.024	9.1
Female	606	0.623	0.463	0.159 *	0.029	34.4
Ethnicity						
European	639	0.780	0.651	0.129 *	0.024	19.8
Māori	465	0.561	0.452	0.109 *	0.030	24.0
Other ethnic	75	0.759	0.736	0.024	0.093	3.2
Pacific Islander	141	0.570	0.500	0.070	0.073	13.9
Sex and ethnicity						
European male	348	0.808	0.730	0.077 *	0.028	10.6
Māori male	246	0.607	0.547	0.060	0.041	11.0
European female	294	0.744	0.558	0.186 *	0.038	33.3
Māori female	219	0.508	0.349	0.159 *	0.046	45.7
Highest school qualification						
None	669	0.608	0.455	0.153 *	0.025	33.7
Level 1	654	0.753	0.693	0.060 *	0.027	8.6
Time between school and tertiary enrolment						
Less than 4 months	726	0.715	0.616	0.099 *	0.024	16.1
4-<18 months	417	0.652	0.528	0.124 *	0.031	23.5
18 months or more	180	0.592	0.481	0.111 *	0.050	23.1
Type of tertiary institution						
ITP or polytechnic	732	0.715	0.617	0.099 *	0.023	16.0
Private training establishment	591	0.633	0.514	0.119 *	0.028	23.2
Field of highest qualification completed						
Natural and physical sciences	s	s	s	s	s	s
Information technology	57	0.630	0.583	0.047	0.083	8.1
Engineering and related technologies	105	0.689	0.678	0.011	0.062	1.6
Architecture and building	222	0.790	0.706	0.084 *	0.038	11.9
Agriculture, environmental and related studies	99	0.606	0.551	0.056	0.058	10.1
Health	39	0.677	0.543	0.134	0.109	24.7
Education	s	s	s	s	s	s
Management and commerce	231	0.611	0.504	0.106 *	0.049	21.1
Society and culture	72	0.727	0.552	0.175 *	0.077	31.6
Creative arts	66	0.574	0.640	-0.066	0.080	-10.3
Food, hospitality and personal services	297	0.696	0.509	0.187 *	0.038	36.7
Mixed field programmes	135	0.640	0.503	0.137 *	0.060	27.2

Notes:

* indicates that the impact estimate is statistically significant at the 95% confidence level.

The numbers of students have been randomly rounded to base 3. s = suppressed for confidentiality reasons.

Proportions and averages have been calculated excluding those who were overseas two years after study.

Earnings have been converted to December 2013 dollar values.

Figures have been derived from the Integrated Data Infrastructure (IDI) managed by Statistics NZ.

Table A16 – Estimated impact of completing a level 4 certificate on the rate of benefit receipt two years later

	Number of students	Proportion receiving benefit				
		Students	Matched comparisons	Impact	Standard error	Relative impact (%)
Total	1,320	0.234	0.313	-0.079 *	0.016	-25.2
Sex						
Male	711	0.172	0.193	-0.022	0.019	-11.2
Female	606	0.310	0.451	-0.141 *	0.027	-31.2
Ethnicity						
European	639	0.155	0.252	-0.097 *	0.020	-38.4
Māori	465	0.337	0.420	-0.083 *	0.029	-19.8
Other ethnic	75	0.204	0.167	0.036	0.088	21.8
Pacific Islander	141	0.263	0.324	-0.061	0.069	-18.7
Sex and ethnicity						
European male	348	0.099	0.149	-0.050 *	0.022	-33.5
Māori male	246	0.283	0.284	-0.001	0.038	-0.3
European female	294	0.227	0.372	-0.145 *	0.035	-38.9
Māori female	219	0.398	0.568	-0.170 *	0.046	-29.9
Highest school qualification						
None	669	0.304	0.408	-0.104 *	0.025	-25.5
Level 1	654	0.160	0.213	-0.053 *	0.022	-24.8
Time between school and tertiary enrolment						
Less than 4 months	726	0.219	0.276	-0.057 *	0.022	-20.7
4-<18 months	417	0.249	0.345	-0.096 *	0.027	-27.8
18 months or more	180	0.261	0.393	-0.132 *	0.045	-33.6
Type of tertiary institution						
ITP or polytechnic	732	0.184	0.275	-0.091 *	0.020	-33.0
Private training establishment	591	0.296	0.360	-0.065 *	0.027	-17.9
Field of highest qualification completed						
Natural and physical sciences	s	s	s	s	s	s
Information technology	57	0.348	0.268	0.080	0.087	29.7
Engineering and related technologies	105	0.156	0.208	-0.053	0.049	-25.3
Architecture and building	222	0.122	0.172	-0.050	0.028	-29.1
Agriculture, environmental and related studies	99	0.266	0.293	-0.027	0.055	-9.3
Health	39	0.258	0.354	-0.095	0.111	-27.0
Education	s	s	s	s	s	s
Management and commerce	231	0.295	0.388	-0.093 *	0.044	-24.0
Society and culture	72	0.255	0.336	-0.081	0.073	-24.2
Creative arts	66	0.315	0.283	0.032	0.076	11.2
Food, hospitality and personal services	297	0.240	0.384	-0.144 *	0.035	-37.5
Mixed field programmes	135	0.263	0.364	-0.101	0.056	-27.7

Notes:

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