# Building on strengths: Manufacturing, Planning, and Construction

Motu economic & public policy research

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# Document information


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## Disclaimer

The opinions, findings, recommendations, and conclusions expressed in this paper are those of the authors, not Te Puni Kōkiri or Motu Economic and Public Policy Research.

These results are not official statistics. They have been created for research purposes from the Integrated Data Infrastructure (IDI) and Longitudinal Business Database (LBD) which are carefully managed by Stats NZ. For more information about the IDI or LBD please visit https://www.stats.govt.nz/integrated-data/.

The results are based in part on tax data supplied by Inland Revenue to Stats NZ under the Tax Administration Act 1994 for statistical purposes. 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.


## Motu Economic and Public Policy Research

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**Abstract**

This is one of 15 "specialty profiles" associated with the report "Building on strengths: Educational pathways that benefit Māori students" (2023). In this specialty profile we investigate the pathways through education associated with strong labour market outcomes for Māori students who showed an interest in and aptitude for Manufacturing, Planning, and Construction at NCEA level 2. Because there are few women in this specialty, we focus primarily on men.

We find no evidence non-industry training qualifications below level 8 benefit men. Although the few men with postgraduate qualifications have comparatively very strong outcomes, qualifications at this level are unlikely to be a realistic route for most men in this specialty.

However, industry training is a very popular educational pathway, and such qualifications at level 3 and above tend to be associated with labour market success.

Men tend to do fairly well if they study Architecture and Building or Engineering and Related Technologies at level 4 or above, but have worse outcomes than those with only level 2 qualifications if they study Society and Culture at level 4 or above.

The Construction and Manufacturing industries seem to be more beneficial places for work experience than is the Agriculture, Forestry, and Fishing industry, and experience in Accommodation and Food Services is particularly associated with weak labour market outcomes.

**JEL codes**

I20, I30, I23, I26, J15, J24

**Keywords**

education, Māori, tertiary study, New Zealand education system, employment, labour market

# Contents

# Tables and Figures

# 1. Introduction

This report details the pathways through education that are associated with strong labour market outcomes for Māori students in Aotearoa New Zealand who showed an interest and aptitude in Manufacturing, Planning, and Construction at NCEA level 2. It is one of 15 "specialty profiles" associated with the main report "Building on strengths: Educational pathways that benefit Māori students" (2023). The goals of the overall project are to support the development of policy that improves Māori outcomes and inform advice that will help Māori students choose beneficial pathways through education. See the main report for a description of the project and detailed explanations of the study population, outcomes, and pathway variables. Because the number of women who specialise in Manufacturing, Planning, and Construction is very small, we focus almost solely on men.

The first measure of labour market success we consider is cumulative savings, which measures the financial resources the students could have accumulated since gaining NCEA level 2.[1] This captures the opportunity cost of higher education as well as any earnings benefit it provides within the 12-year window after NCEA level 2 that we study. However, students who gain higher qualifications may have low cumulative savings even 12 years after NCEA level 2, but high annual income. This would mean they have the potential to rapidly increase their cumulative savings in subsequent years. We thus also consider annual savings, which captures the rate at which students' financial resources could be increasing each year.

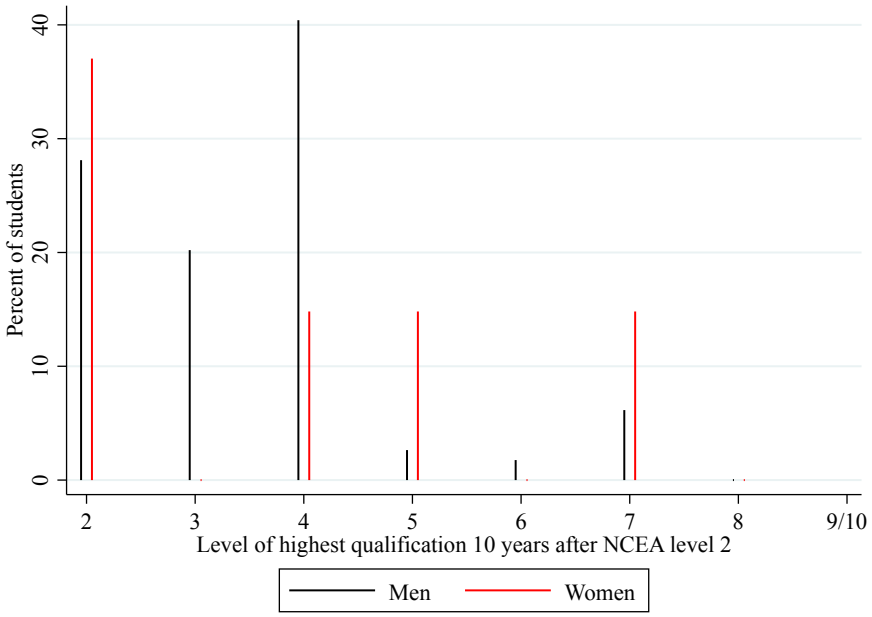
The remainder of this report proceeds as follows. Section 2 describes the backgrounds and labour market outcomes of students who specialised in Manufacturing, Planning, and Construction. Section 3 shows the levels of highest qualification that are associated with strong outcomes. Section 4 shows the fields of study at each level of education that are associated with strong outcomes. Section 5 investigates the self-employment of these students and its relationship to savings. Section 6 shows the pathways outside education that are associated with strong outcomes. Finally, Section 7 summarises the pathways through education and life that look likely to lead to strong labour market outcomes for men who specialised in Manufacturing, Planning, and Construction at school.

[1] The overall magnitude of savings is sensitive to the assumptions we use to calculate it, so the dollar values should not be taken too seriously. However, differences between students are relatively robust, so more weight can be put on the comparisons between students with different characteristics.

## 2. Overview of the students who specialised in Manufacturing, Planning, and Construction

Māori students who specialised in Manufacturing, Planning, and Construction are defined as students who showed strong results in NCEA level 2 standards in subjects such as joinery, construction trades, and textiles manufacture.[2] The sample is limited to those who achieved NCEA level 2 between 2004 and 2007 when aged 16 to 19, and who were not in the top 10% of their year academically. A total of 381 students specialised in Manufacturing, Planning, and Construction, 10% of whom are female, and 33% of whom gained NCEA level 2 at a tertiary institute.

*Figure 1: Distribution of level of highest qualification*



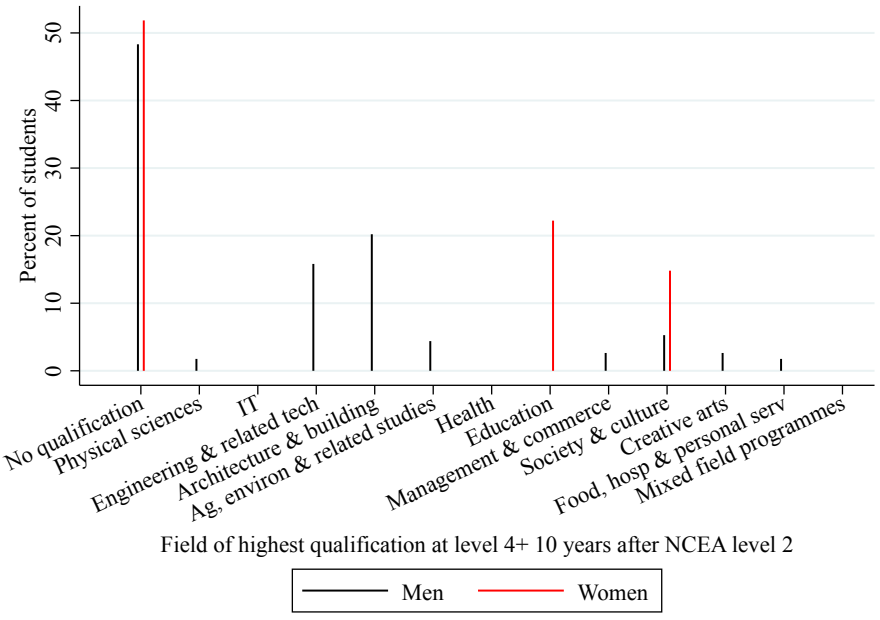

Notes: This figure shows the highest level of qualification gained by men and women who specialised in Manufacturing, Planning, and Construction. To be counted, qualifications must have been gained within 10 years of achieving NCEA level 2. Small but non-zero values may be presented as zeros for confidentiality reasons.

[2] The full list of subjects included in the specialty Manufacturing, Planning, and Construction is: clothing manufacture; food processing; furniture trades; glass and glazing; outdoor fabric products; plastics processing technology; printing; textiles manufacture; joinery; dairy manufacturing; paperboard case manufacturing; wood panels manufacturing; footwear and leather trades; manufacturing skills; pulp and paper manufacturing; meat processing; industrial machine knitting; energy and chemical plant, food and related products processing; steel manufacturing; leather manufacturing; solid wood processing; boating industries; furniture; meat inspection services; cablemaking; supply chain management; wood processing technology; coatings, inks, and adhesives; pharmaceutical and allied products; fibreboard packaging; solid wood manufacturing; wood fibre manufacturing; wood handling and distribution; wood manufacturing - generic skills; industrial textile fabrication; animal product examination services; baking yeasts manufacturing, composites; fellmongery and leather processing; construction trades; painting and decorating; plumbing, gasfitting and drainlaying; surveying; construction trade skills; construction; masonry; concrete; and decorative fixtures and finishes. Not all of these subjects are necessarily available to study at level 2.

Figure 1 shows the highest level of qualification attained within 10 years of gaining NCEA level 2 by men and women who specialised in Manufacturing, Planning, and Construction. The most common higher qualification for men is level 4 (40%), followed by level 2 (28%) and level 3 (20%). Low proportions of men get qualifications above level 4. Women are most likely to gain only level 2 qualifications, but some also achieve level 4, 5, or 7.

Figure 2 shows the distribution across fields of study of the highest qualifications of men and women who specialised in Manufacturing, Planning, and Construction at level 2. Among those who gain qualifications at level 4 or above, the most common field of study for women is Education (22%) and for men is Architecture and Building (20%). Men are also likely to get qualifications in Engineering and Related Technologies (16%), and women in Society and Culture (15%). Around half of men and women do not obtain a qualification at level 4 or above.

*Figure 2: Distribution of field of highest qualification*

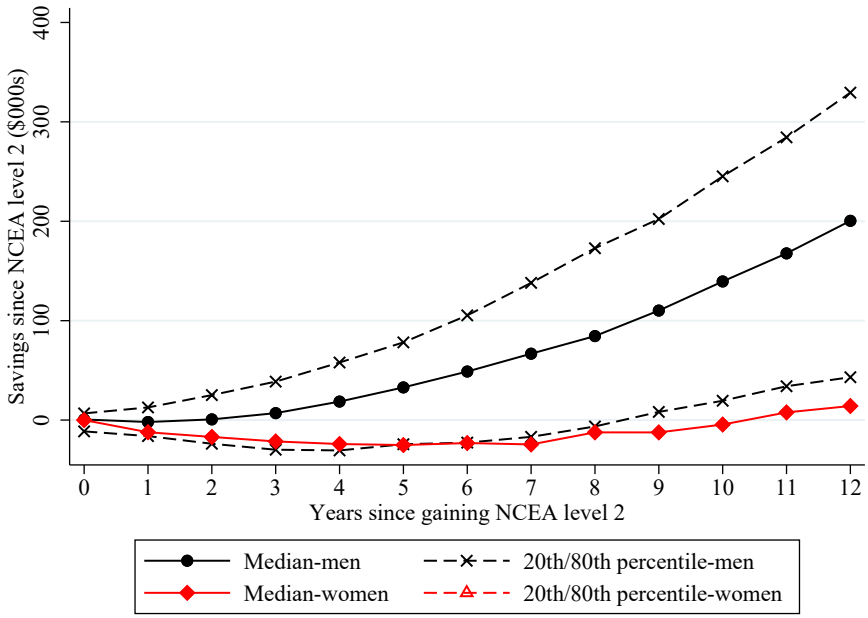



Notes: This figure shows the percentage of students whose highest qualification (at level 4 or above) is in each field among those who specialised in Manufacturing, Planning, and Construction. Students may be included in more than one field if they have multiple highest qualifications at the same level. Those whose highest qualification is below level 4 are included in the "No qualification" category. To be counted, qualifications must have been gained within 10 years of achieving NCEA level 2. Small but non-zero values may be presented as zeros for confidentiality reasons.

Figure 3 shows the evolution over time of the distribution of cumulative savings for men and women who specialised in Manufacturing, Planning, and Construction. Due to confidentiality rules, the 20$^{th}$ and 80$^{th}$ percentiles for women's cumulative savings have not been included.

Median cumulative savings for men are close to $0 for the first 3 years before sharply increasing. By 12 years after NCEA level 2, median cumulative savings for men have reached $200,000. However, women's median cumulative savings become positive only 11 years after NCEA level 2 and remain close to $0 in year 12. In fact, women's median cumulative savings 12 years after NCEA level 2 are less than the savings of men at the 20th percentile.

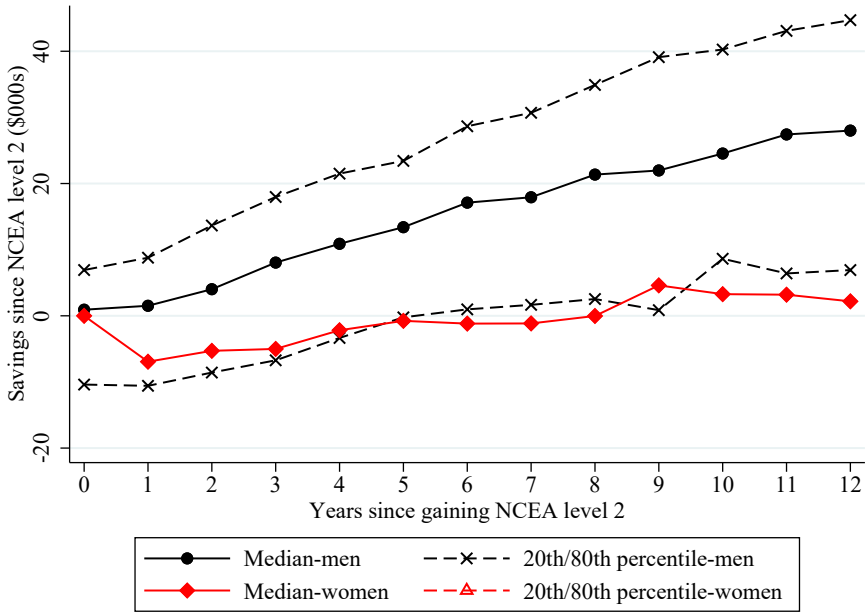
*Figure 3: Cumulative savings over time by gender*




Notes: This figure shows how the median, 20th percentile, and 80th percentile of cumulative savings since gaining NCEA level 2 change over time for men and women who specialised in Manufacturing, Planning, and Construction. The 20th and 80th percentiles for women are omitted due to confidentiality rules.

Figure 4 similarly shows how the distribution of annual savings changes over time for men and women who specialised in Manufacturing, Planning, and Construction. It shows median men's annual savings are immediately ahead of median women's 1 year after NCEA level 2, and subsequently grow more quickly. Twelve years after NCEA level 2, men's median annual savings are nearly $30,000, compared with only a few thousand for women. The large annual savings gap in year 12 suggests men's cumulative savings in later years will continue to pull even further ahead of women's.

*Figure 4: Annual savings over time by gender*




Notes: This figure shows how the median, 20th percentile, and 80th percentile of annual savings change over time for men and women who specialised in Manufacturing, Planning, and Construction. The 20th and 80th percentiles for women are omitted due to confidentiality rules.

# 3. How do savings vary with level of qualifications?

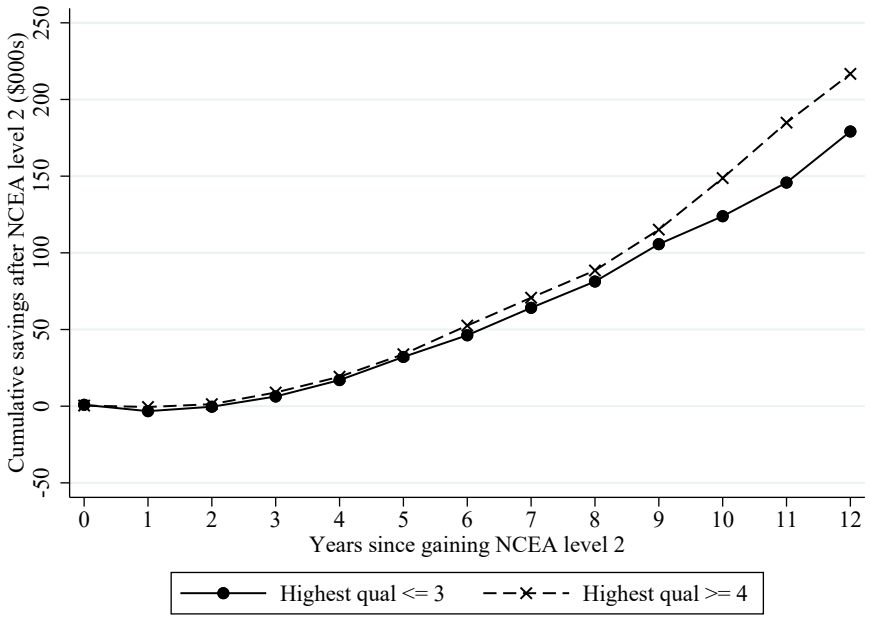
This section shows how the cumulative and annual savings of students who specialised in Manufacturing, Planning, and Construction vary with their highest level of qualification.

## 3.1 Cumulative and annual savings by level of highest qualification

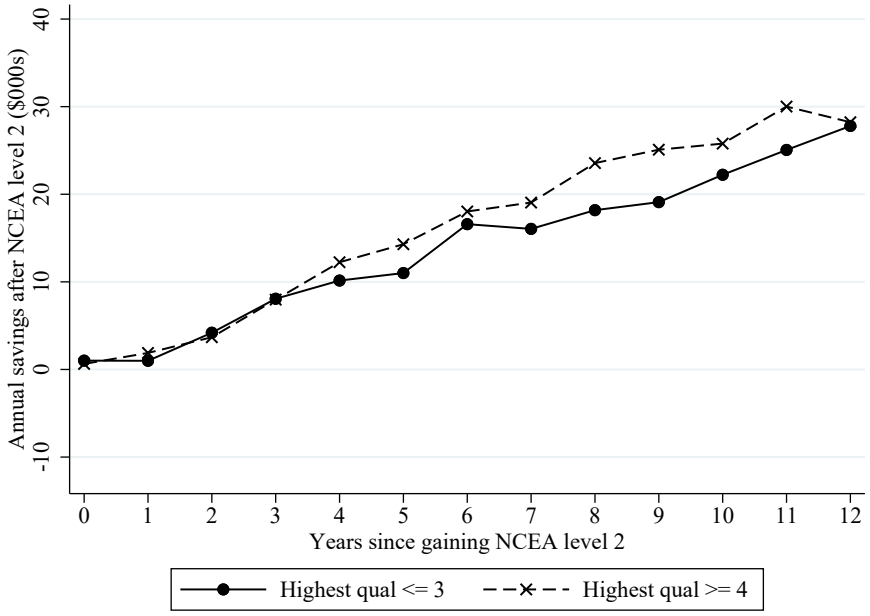
Figure 5 shows how median cumulative and annual savings change over time after gaining NCEA level 2 for men who achieve different levels of highest qualification. Figure 5 shows men with low qualifications (level 2 or 3) have similar savings over time to those with higher qualifications (level 4 and above) until year 10, at which point they begin to fall behind due to a persistent gap in annual savings. By 12 years after NCEA level 2, men with low qualifications have median cumulative savings nearly $40,000 lower than those of men with higher qualifications. Due to the small sample, we do not present savings by level of highest qualification for women.

*Figure 5: Savings over time by level of highest qualification for men*

Panel A: Cumulative savings




Panel B: Annual savings

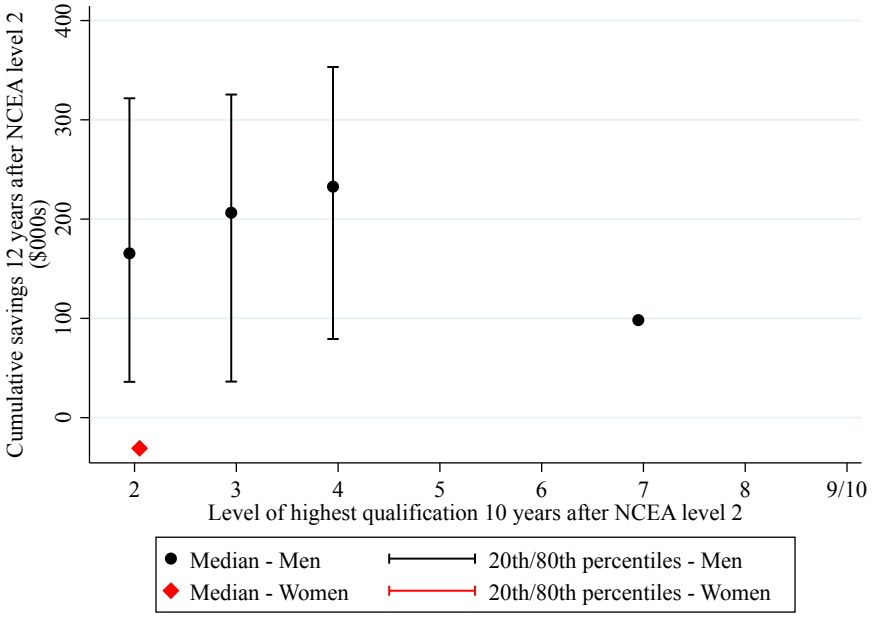



Notes: This figure shows changes over time in the median of cumulative savings since gaining NCEA level 2 (Panel A) and median of annual savings (Panel B) for men who specialised in Manufacturing, Planning, and Construction and achieved different levels of highest qualification. Qualifications are included if they were gained within 10 years of NCEA level 2.

Figures 6 and 7 explore the distribution of cumulative and annual savings after 12 years for men and, where possible, women with this specialty by disaggregated level of highest qualification. They show men's median savings benefit from each additional level of qualification

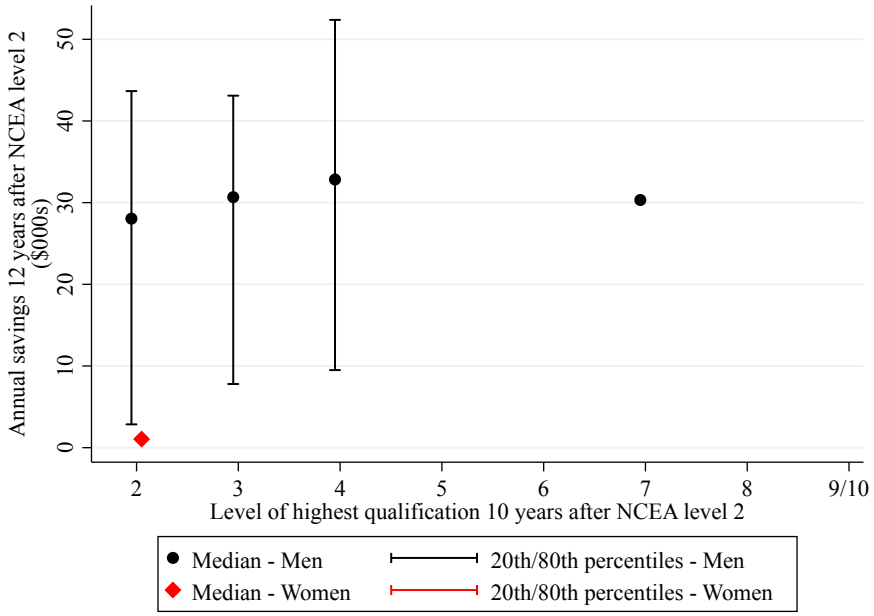
up to level 4, but are lower for men with level 7 qualifications than for those with level 4. Women with level 2 qualifications have negative median cumulative savings and median annual savings barely above zero.

*Figure 6: Cumulative savings 12 years after NCEA level 2 by level of highest qualification*




Notes: This figure shows the median and 20th and 80th percentiles of cumulative savings 12 years after NCEA level 2 of men who specialised in Manufacturing, Planning, and Construction by the detailed level of their highest qualification. Qualifications are included if they were gained within 10 years of NCEA level 2. Note the median is plotted if the number of observations is 10 or larger, and the 20th and 80th percentiles are plotted if the number of observations is 50 or larger.

*Figure 7: Annual savings 12 years after NCEA level 2 by level of highest qualification*




Notes: This figure shows the median and 20th and 80th percentiles of annual savings 12 years after NCEA level 2 of men who specialised in Manufacturing, Planning, and Construction by the detailed level of their highest qualification. Qualifications are included if they were gained within 10 years of NCEA level 2. Note the median is plotted if the number of observations is 10 or larger, and the 20th and 80th percentiles are plotted if the number of observations is 50 or larger.

## 3.2 Qualification levels of top cumulative and annual savers

In this section we categorise men who specialised in Manufacturing, Planning, and Construction by whether they are top cumulative savers or top annual savers, and show the level of qualifications and types of education providers attended that are associated with being a top saver. We do not analyse women because the sample is very small. A student is considered a top cumulative (or annual) saver if their cumulative (annual) savings 12 years after NCEA level 2 are in the top 20% of cumulative (annual) savings for Māori students of their gender who specialised in Manufacturing, Planning, and Construction. Note the comparisons in this section are all with other students of the same gender in the same specialty, so being a top saver means a student does well in the labour market compared with similar students. This can be but is not necessarily the same as doing well in absolute terms.

Appendix Table 1 shows the characteristics associated with men being top cumulative savers or top annual savers. The left-hand side of the table describes each characteristic. Column (1) gives the percentage of students who are *not* top cumulative savers who have the characteristic, and column (2) gives the percentage of students who *are* top savers who have the characteristic. Column (3) is the odds ratio, defined as the proportion of students *with* the

characteristic who are top cumulative savers divided by the proportion of students *without* the characteristic who are top savers. Thus an odds ratio of 1 means the probability of being a top cumulative saver is unrelated to whether a student has the characteristic, an odds ratio above 1 means a student is *more* likely to be a top cumulative saver if they have the characteristic, and an odds ratio below 1 means a student is *less* likely to be a top cumulative saver if they have the characteristic. Asterisks on the odds ratio indicate whether it is statistically significantly different to 1. Columns (4) to (6) replicate columns (1) to (3) but for annual instead of cumulative savings.

Appendix Table 1 explores the characteristics top savers are more likely to have, but it considers only one characteristic at a time. Appendix Table 2 uses regressions to explore for the relationship between having various characteristics and being a top saver, controlling for students' backgrounds and a selection of other characteristics. The first four columns of Appendix Table 2 investigate the correlates of being a top cumulative saver, while the last four columns look at being a top *annual* saver. On each side of the table, the first column controls for background characteristics only, the second adds level of highest qualification of any type, and the third distinguishes highest qualifications by whether they are industry training qualifications or not. In the third column, the comparison group for all the level of qualification variables is students whose highest qualifications are at level 2 and are not industry training qualifications. To compare, for instance, the probability a student with a level 4 industry training qualification is a top saver with the probability a comparison group student is a top saver, the coefficients on "highest qualification is level 4" and "highest industry training qualification is level 4" are added together. The fourth column on each side of the tables does not explicitly distinguish industry training qualifications from other types of qualifications, but controls for level of highest qualification and the types of tertiary institute attended. Here the coefficients on type of tertiary institute attended should be interpreted as conditional on students' background characteristics and level of highest qualification. The remainder of this section discusses the results from Appendix Tables 1 and 2.

Only 18% of men gain a level 3 NCEA certificate within a year of gaining their level 2 certificate, and 28% within 5 years. The bivariate analysis shows men who achieve level 3 are not significantly more or less likely to be top savers than are men who don't.

In regressions that control for students' backgrounds, men's qualifications are not significantly associated with the probability they are top cumulative savers. However, men with level 4 qualifications are weakly more likely than those with only level 2 to be top *annual* savers, and the few men with level 8 or above are much more likely.

Industry training is a very common pathway taken by men: 57% of men complete some industry training credits and 40% gain an industry training qualification. It also appears highly beneficial for them in terms of both cumulative and annual savings. Forty percent of men achieve any industry training credits at level 4 or above. These men are 2.4 times as likely as men who do not achieve any industry training credits at level 4 or above to be top cumulative savers and also 2.4 times as likely to be top annual savers. The regression analysis tells a similar story, with level 3 to 6 industry training qualifications predicting men being top cumulative and annual savers. Men with level 3 industry training qualifications are more likely to be top savers than those with level 4, and those with level 5 or 6 are more likely again, though the differences are not statistically significant.

Eighty percent of men who specialised in Manufacturing, Planning, and Construction attend a private training establishment. Both when considered in isolation and conditional on student background characteristics and the highest level of qualification they achieve, this is associated with a higher probability of being a top annual saver.

In the bivariate analysis, men who attend a school or tertiary institute in a secondary urban area are weakly more likely than men who don't to be top cumulative savers and more than twice as likely as other men to be top annual savers. In contrast, those who attend school or tertiary in a rural centre or rural area are only half as likely as other men to be top cumulative savers.

In addition to controlling for students' pathways through education, the regressions in Appendix Table 2, described at the start of this section, control for various student background characteristics (the first five controls presented at the top of the table). They show men who attend a higher decile school are more likely to be top cumulative and annual savers. Those who attend school outside the main urban areas are weakly more likely to be top cumulative savers, whereas men with multiple specialties are weakly less likely to be top annual savers.

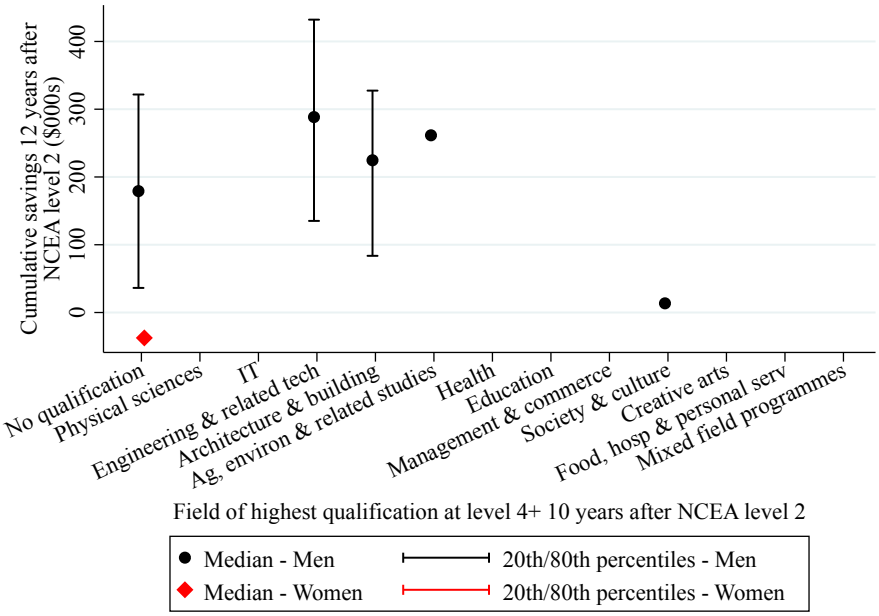
## 4. How do savings vary with fields of study in higher education?

This section shows how the cumulative and annual savings of students who specialised in Manufacturing, Planning, and Construction vary with the fields in which they study at various levels and gain qualifications.

## 4.1 Cumulative and annual savings by fields of study

Figure 8 shows how the cumulative savings after 12 years differ for men and, where possible, women whose highest qualifications at level 4 or above are in different fields. Figure 9 shows the same but for annual rather than cumulative savings. As Figure 2 showed, the highest proportion of men and women have no qualification at level 4 or above. Such men have below average cumulative savings, around $180,000 at the median, but similar women have negative savings. The men have median annual savings of $30,000 and the women have $1,000.

*Figure 8: Cumulative savings 12 years after NCEA level 2 by gender and field of highest qualification*

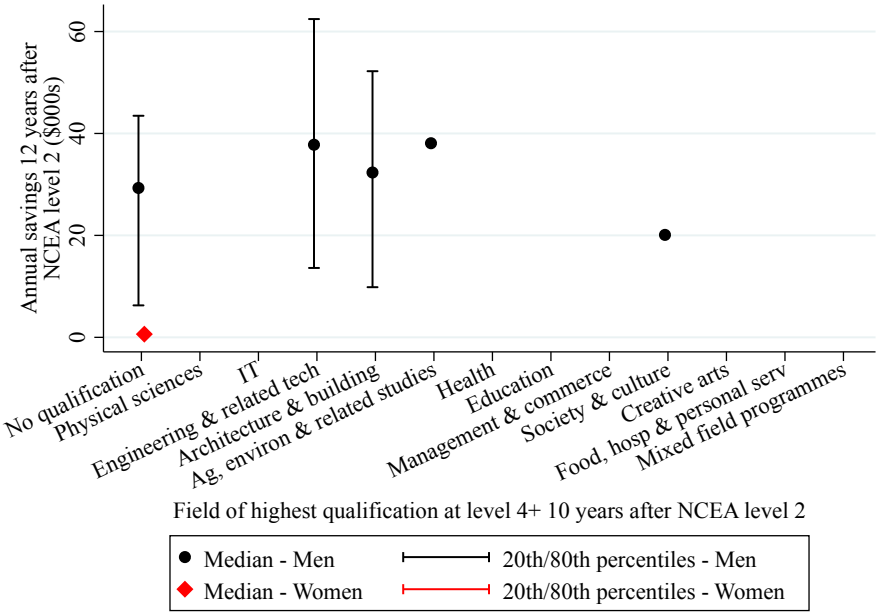



Notes: This figure shows the median and 20th and 80th percentiles of cumulative savings 12 years after NCEA level 2 of men and women who specialised in Manufacturing, Planning, and Construction by the field of their highest qualification at level 4 or above gained within 10 years of NCEA level 2. "No qualification" includes qualifications at level 3 and below. The median is plotted if the number of observations is 10 or larger, and the 20th and 80th percentiles are plotted if the number of observations is 50 or larger.

The most common fields for higher qualifications for men are Architecture and Building and Engineering and Related Technologies, obtained by 20% and 16% of men respectively. Engineering and Related Technologies offers the highest cumulative savings, just under $290,000, and annual savings of around $40,000, equal highest with Agriculture, Environment, and Related Studies. Architecture offers slightly lower cumulative savings of $225,000 at the median, and annual savings of about $30,000. Agriculture, Environment, and Related Studies too

offers strong savings, but Society and Culture offers cumulative and annual savings substantially lower than having no qualifications at this level (around $14,000 and $20,000 respectively).

*Figure 9: Annual savings 12 years after NCEA level 2 by gender and field of highest qualification*




Notes: This figure replicates Figure 8 but presents annual savings rather than cumulative savings.

## 4.2 Fields of higher study of top cumulative and annual savers

In this section we again categorise men and women who specialised in Manufacturing, Planning, and Construction by whether they are top cumulative savers or top annual savers, and show how the fields in which they study and gain qualifications are associated with being a top saver of either kind. As in Section 3.2, we conduct both bivariate and regression analysis. Again, being a top saver means doing well compared with other students of the same gender in the same specialty, and is not a statement about how well the student is doing in absolute terms.

### *4.2.1 Fields of study at school level*

We first consider fields of study at NCEA levels 2 and 3. This is school-level study, but may be done either at school or at a tertiary institute after the student leaves school. The bivariate analysis discussed in this section is presented in Appendix Table 3, and the regressions are in Appendix Table 6. The first three columns in the regression table explore the correlates of being a top cumulative saver, and the other three columns look at being a top annual saver. On each side of the table, the first column controls only for student background characteristics (high school decile, percentile score etc) and fields of study at level 3. Here the coefficient on passing

14 credits in a subject at level 3 compares students with the same background and who passed 14 credits in all the same level 3 subjects except for that one. The coefficient can be interpreted as the difference in probability of being a top saver related to that one field in which they differ.

In many cases, the subjects in which a student passes 14 credits at level 3 affect the student's subsequent pathway through education, such as their fields of study at higher levels, and these in turn affect their ability to save. In the first column, all such impacts are captured by the coefficients on the variables for passing credits in level 3 subjects. In subsequent columns, we add controls for either fields of higher study or fields of higher qualification. In these columns, the coefficients on level 3 subject credits can be interpreted as differences in the probability of being a top saver based on passing the level 3 credits in that field, given the field the student went on to study or gain qualifications in.

In simple bivariate comparisons, men who pass at least 14 credits at level 2 in Maths or Science are 80% and 85% respectively more likely than men who don't to be top annual savers, and those who pass Science credits are also 85% more likely to be top *cumulative* savers. However, only about a quarter of men pass these credits in each of the two subjects. *Achievement* standard credits in these subjects are even more strongly associated with being a top saver, and such credits in English are also strongly associated with being a top annual saver.

In regressions that control for students' backgrounds and other level 3 fields of study, men who pass at least 14 credits at level 3 in the Service Sector or Engineering and Technology are more likely to be top cumulative and top annual savers. These relationships are not primarily explained by the fields of study the men go on to at higher levels. The relationships are also evident in the bivariate analysis, which additionally shows English credits are associated with being a top cumulative saver, and Maths and Science credits with being a top annual saver.[3]

### *4.2.2 Tertiary-level fields of study*

In this subsection, we consider fields of study primarily at levels 4 and higher. Study at level 4 and above is tertiary-level study, which is not done at school. Level 7 qualifications include bachelor's degrees and other qualifications at the same level. The qualifications above level 7 are honours degrees, master's degrees, and doctorates, all of which generally involve original research. Note the field categorisations available in the data at this level differ from the categorisations used above for school-level study (levels 2 and 3) above. The bivariate analysis discussed in this section in presented in Appendix Tables 7 to 10, and the regressions are in Appendix Tables 11 and 12.

[3] English, Maths, and Science credits are not included in the regressions because only a low proportion of students gain them.

Columns (2) and (5) in the regression tables control for student background and level 3 fields of study, and also the common fields in which students pass at least 0.5 EFTS of courses at level 4 and above and separately at level 7 and above. The coefficient on each field of study at level 4 and above compares the probability of being a top saver for two students with the same earlier educational history, but one of whom left education after level 3, and the other of whom studied in that field at level 4 to 6. To compare the probability of being a top saver of a student who completed at least 0.5 EFTS of courses in a field at level 7 or above with that of a similar student who left education after level 3, the coefficients on "passed at least 0.5 EFTS at level 4+ in the field" and "passed at least 0.5 EFTS at level 7+ in the field" must be added together. Columns (3) and (6) in the table replace the EFTS controls with controls for qualifications gained. Here the comparison student is someone with the same background and level 3 fields of study, but who left education without gaining a qualification at level 4 or above. As before, to compare this student with a similar student who gained a qualification at bachelor's level or above in a particular field, the coefficients on "gained qualification at level 4+ in the field" and "gained bachelor's degree+ in the field" must be added together.

Architecture and Building is the field in which men are most likely to pass at least 0.5 EFTS of courses at level 4 and above. Twenty-five percent of men do so, and 20% gain a qualification in this field at this level, though under 5% gain a qualification in the field at bachelor's level or above. In the regressions, men who pass EFTS (or gain qualifications) in this field at level 4 or above are similarly likely to be top cumulative savers to students with the same backgrounds and level 3 fields of study, but who don't study (gain qualifications) above level 3. However, they are considerably (though at most weakly significantly) more likely to be top annual savers.

Engineering and Related Technologies is men's next most common field of study. In the bivariate analysis it is strongly positively associated with being a top saver. The 15% of men who pass at least 0.5 EFTS in the field at level 4 or above are 2.5 times as likely as other men to be top cumulative savers and 2.4 times as likely to be top annual savers. Men who gain qualifications in the field at this level do similarly well. In regressions that control for men's backgrounds and level 3 fields of study, the benefits of Engineering and Related Technologies are somewhat less stark. However, study in the field at levels 4 to 6 is associated with a substantially higher probability of being a top cumulative saver when compared with a similar education-leaver, and a bachelor's degree or higher is associated with a much higher probability of being a top annual saver.

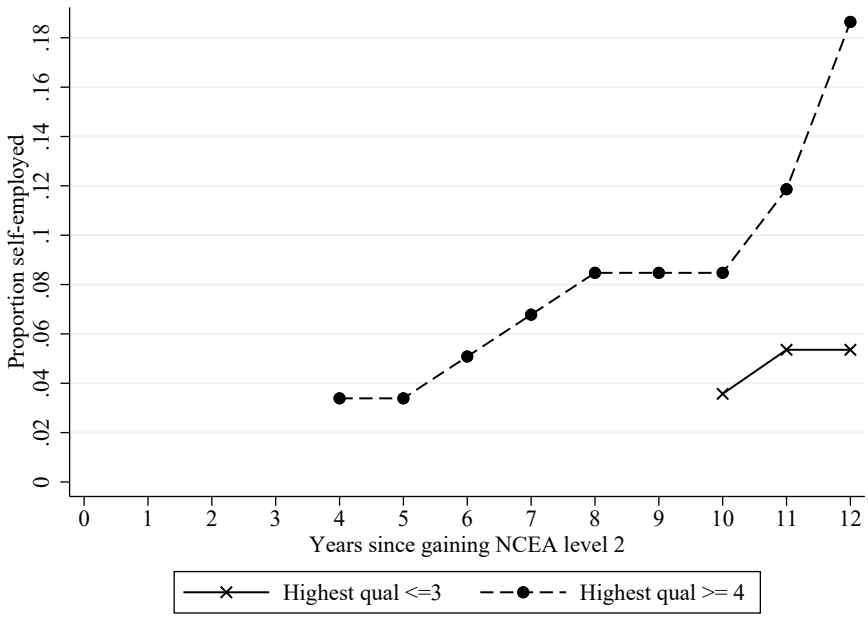
# 5. How do savings vary with self-employment?

This section first shows how self-employment rates vary over time and by level of highest qualification for students who specialised in Manufacturing, Planning, and Construction. It then shows how cumulative and annual savings differ for those who are ever self-employed.

## 5.1 Self-employment by level of highest qualification

This section shows how the self-employment of men who specialised in Manufacturing, Planning, and Construction varies over time for each level of highest qualification. Figure 10 shows men with qualifications at level 4 or above are much more likely than less qualified men to be self-employed. Self-employment rates for these more qualified men grow steadily from 5 years after NCEA level 2, and sharply increase after year 10 to reach around 19% by year 12. This is a very high self-employment rate compared with the rate for men in most other specialties. In comparison, around 5% of men with qualifications at level 3 or below are self-employed in year 12.

*Figure 10: Self-employment over time by highest qualification for men*

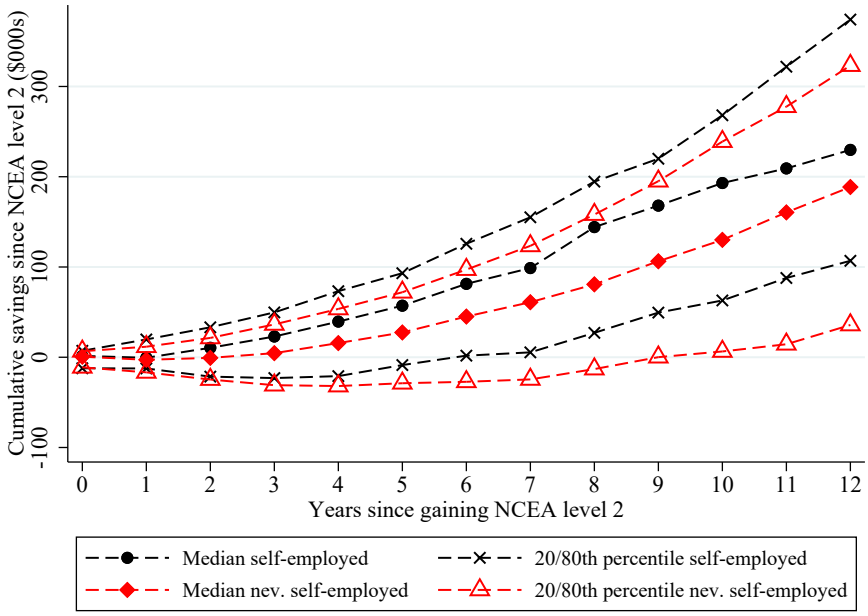



Notes: This figure shows how the proportion of self-employed workers changes over time for men who specialised in Manufacturing, Planning, and Construction and achieved different levels of highest qualification. Qualifications are included if they were gained within 10 years of NCEA level 2. Missing values denote self-employed counts so low they must be supressed under Statistics New Zealand's confidentiality rules.

## 5.2 Cumulative and annual savings by self-employment status

Figure 11 compares the cumulative savings of men who were ever self-employed in the first 12 years after NCEA level 2 with the savings of those who were never self-employed in this period. The savings of the two groups could differ for several reasons. First, self-employment could affect savings, for instance, if self-employed people give up wage income while establishing their businesses or earn profits that differ from what their wages would have been. Second, those who choose to become self-employed may not be representative of the population as a whole. They may have a history of higher or lower earnings, depending on the motivations that drive people to become self-employed.[4] Third, self-employment involves a change in the way income is recorded and reported, and for tax purposes self-employed individuals tend to have an incentive to make their income appear as low as possible. Thus the measurement error in income may differ for the self-employed relative to those not self-employed.

*Figure 11: Cumulative savings over time by whether ever self-employed for men*




Notes: This figure shows the median and 20th and 80th percentiles of cumulative savings of men who specialised in Manufacturing, Planning, and Construction by whether they were self-employed in any year from the year they gained NCEA level 2 to the 12th year after that.

Figure 11 shows that men who are ever self-employed tend to have higher cumulative savings than those who are never self-employed. The savings gap emerges very early, just a few

[4] For instance, self-employment may be a way for successful employees to keep a higher proportion of the value they create (positive selection into self-employment), or it may be a last resort for individuals who can't secure employment or who place high value on objectives other than income (negative selection).

years after NCEA level 2, and tends to grow over time. By 12 years after NCEA level 2, men who have ever been self-employed have median cumulative savings around $45,000 greater than those of men who have never been self-employed. This gap is larger at the 20$^{th}$ percentile, and slightly smaller at the 80$^{th}$ percentile. The early emergence of the savings gap relative to when the self-employment rate becomes substantial suggests men with greater savings potential are more likely to become self-employed.

## 6. How do savings vary with pathways through life outside education?

This section shows how the cumulative and annual savings of students who specialised in Manufacturing, Planning, and Construction vary with their fertility decisions, overseas experience, and work experience in the first five years after NCEA level 2. We again categorise men and women by whether they are top cumulative savers or top annual savers, and show how the pathways they take outside education are associated with being a top saver of either kind. As in previous sections, we conduct both bivariate and regression analysis. Again, being a top saver means doing well compared with other students of the same gender in the same specialty.

The bivariate analysis is presented in Appendix Tables 13 and 14. As previously, these tables show the proportion of top and non-top savers who have each characteristic and the odds ratio (calculated as the probability a student with the characteristic is a top saver divided by the probability a student without the characteristic is a top saver). Many of the characteristics shown in these tables relate to work experience. In particular, we look at whether the student worked for a certain type of employer for at least one year or at least three years in the first five years after NCEA level 2. Note here we limit the sample considered to those students who had at least that many years of work experience for some employer. For example, when considering whether students had at least 3 years of experience working for central government, the students without the characteristic are those who have at least three years of work experience, but who do not have three years of experience working for central government.

The regression analysis is presented in Appendix Tables 15 and 16. The first three columns in each table explore the correlates of being a top cumulative saver, and the last three columns look at being a top annual saver. All columns control for students' backgrounds, level of highest qualification, fields of study, the timing of their children's births, and their overseas experience. The second and third columns on each side of the table also control for years of early work experience and various characteristics of the employers where the experience was gained. The coefficients on the employer type variables should be interpreted as comparisons with students

who have the same education and years of experience, but who don't have that particular type of experience. The remainder of this section discusses the results from Appendix Tables 13 to 16.

In both the bivariate comparisons and the regressions that control for a wide range of characteristics including education, men's fertility is largely not significantly related to being a top saver. The exception is that men who have a child in years 6 to 10 are more likely to be top annual savers than similar men who do not.

Men who have overseas experience in year 11 or 12 are considerably more likely to be top annual savers and weakly more likely to be top cumulative savers than are those with similar backgrounds and education, but who don't go overseas. This is partly because we impute overseas earnings and assume overseas wages are higher than New Zealand wages.

The regressions show that men who work in all of the first five years after NCEA level 2 are more likely to be top cumulative savers than men with similar backgrounds and educations who work less. Greater early work experience is also somewhat associated with a higher probability of being a top annual saver. They also show that work experience at medium-sized employers in this period contributes less than other work experience to being a top annual saver.

Construction is the most common industry in which men have work experience (39% with at least one year of experience in years 1 to 5 after NCEA level 2 have Construction experience), followed by Manufacturing (26%). The regressions compare men with the same education, timing of children, and early years of work experience, and ask whether those with work experience in a particular industry are more likely to be top cumulative or annual savers than are those who are otherwise similar but have not worked in that particular industry. They show neither Construction nor Manufacturing experience is significantly associated with the probability of being a top saver, but Construction experience is insignificantly more beneficial than Manufacturing experience. However, experience in Agriculture, Forestry, and Fishing, Accommodation and Food Services, or Administrative and Support Services is associated with a lower probability of being a top saver than is experience in other industries.

# 7. Conclusions

In this specialty profile, we focussed on Māori students who specialised in Manufacturing, Planning, and Construction at NCEA level 2, and who achieved a level 2 NCEA certificate by age 19 even though they were not top academic performers. Because there are very few women in this specialty, we focussed primarily on men. We investigated separately by gender the pathways through education and life that are associated with strong labour market outcomes for these students, measuring labour market outcomes with cumulative and annual savings 12 years

after NCEA level 2. In the regression analysis we controlled for several characteristics of students' backgrounds, but all the relationships we find should be considered suggestive of causality rather than necessarily causal.

Few Māori men who specialised in Manufacturing, Planning, and Construction at level 2 gain qualifications above level 4, and highest qualifications at levels 2, 3, and 4 are all common. Non-industry training qualifications below level 8 generally don't seem to improve men's labour market outcomes when compared with level 2 non-industry training qualifications. Qualifications at level 8 and above are associated with very strong outcomes, but very few men attain such qualifications, and most men in the specialty are unlikely to have the academic background or interest for this level of study. However, 35% of men gain an industry training qualification at level 3 or above, and this is associated with comparatively strong outcomes.

Men who study Architecture and Building, the most common field for higher study, at levels 4 to 6 tend to do relatively well in the labour market, as do men who study the other common field, Engineering and Related Technologies. The latter is particularly the case for men who gain a qualification in the field at bachelor's level or above. However, men who study Society and Culture, particularly at level 7 and above, have worse outcomes than similar men who leave education after level 3.

Construction and Manufacturing, the two most common industries in which men gain early work experience, are both associated with moderate savings, though Construction may be a little more beneficial. The two next most common industries, Agriculture, Forestry, and Fishing, and Retail Trade, are both associated with somewhat weaker savings, and experience in Accommodation and Food Services is linked to very weak outcomes.

**Appendix Table 1: Qualification levels of men who are top savers**

| | Cumulative savings | | | Annual savings | | | |
|---|---|---|---|---|---|---|---|
| | % of students with characteristic among: | | Odds ratio | % of students with characteristic among: | | Odds ratio | Students |
| | Non-top savers | Top savers | | Non-top savers | Top savers | | |
| Characteristic | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| **School qualifications gained:** | | | | | | | |
| NCEA cert level 3 within 1 yr | 18.5 | 14.3 | 0.78 | 17.6 | 18.2 | 1.03 | 342 |
| NCEA cert level 3 within 5 yrs | 28.3 | 27.3 | 0.96 | 27.5 | 29.2 | 1.07 | 342 |
| University Entrance within 1 yr | 9.8 | 9.1 | 0.94 | 9.8 | 13.6 | 1.34 | 342 |
| **Level of highest qualification gained within 10 years:** | | | | | | | |
| Level 2 | 29.3 | 27.3 | 0.92 | 31.5 | 21.7 | 0.66* | 342 |
| Level 3 | 19.6 | 18.2 | 0.93 | 20.9 | 13.6 | 0.65 | 342 |
| Level 4 | 38.7 | 45.5 | 1.25 | 37.4 | 52.2 | 1.61** | 342 |
| Level 5 | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Level 6 | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Level 7 | 6.5 | <8.7 | <1.29 | 6.5 | <8.7 | <1.29 | 342 |
| Level 8 | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Level 9 or 10 | <5% have characteristic | | | <5% have characteristic | | | 342 |
| **Industry training credits gained within 10 years:** | | | | | | | |
| Any credits | 52.2 | 77.3 | 2.56*** | 52.7 | 69.6 | 1.79*** | 342 |
| Any credits at level 4+ | 34.4 | 60.9 | 2.37*** | 33.7 | 60.9 | 2.42*** | 342 |
| 50+ credits | 37.0 | 59.1 | 2.06*** | 37.0 | 59.1 | 2.06*** | 342 |
| 50+ credits at level 4+ | 24.7 | 45.5 | 2.07*** | 23.9 | 50.0 | 2.41*** | 342 |
| **Level of highest industry training qualification gained within 10 years:** | | | | | | | |
| Level 2+ | 34.8 | 60.9 | 2.33*** | 34.8 | 60.9 | 2.33*** | 342 |
| Level 3+ | 29.0 | 60.9 | 2.85*** | 29.3 | 60.9 | 2.81*** | 342 |
| Level 4+ | 23.9 | 45.5 | 2.14*** | 23.1 | 45.5 | 2.20*** | 342 |
| **Types of tertiary institute where student enrolled within 10 years (for students who enrolled in any tertiary):** | | | | | | | |
| Industry Training Organisation | 68.1 | 77.3 | 1.46* | 68.5 | 73.9 | 1.24 | 342 |
| Institute of Technology/Polytech | 87.0 | 90.5 | 1.34 | 87.0 | 86.4 | 0.96 | 342 |
| Private Training Establishment | 78.3 | 86.4 | 1.60* | 76.9 | 90.9 | 2.56** | 342 |
| University | 15.4 | 18.2 | 1.17 | 14.1 | 22.7 | 1.57 | 342 |
| Wananga | 12.0 | 9.5 | 0.81 | 9.9 | 13.6 | 1.33 | 342 |
| Other Tertiary Provider | 9.8 | 22.7 | 2.10** | 12.0 | 13.6 | 1.13 | 342 |
| **Locations of education providers where student enrolled within 10 years (including schools):** | | | | | | | |
| Main urban area | <5% do not have characteristic | | | <5% do not have characteristic | | | 342 |
| Secondary urban area | 20.7 | 31.8 | 1.58* | 19.6 | 39.1 | 2.10*** | 342 |
| Minor urban area | 36.6 | 40.9 | 1.16 | 35.2 | 39.1 | 1.14 | 342 |
| Rural centre or rural area | 26.9 | 14.3 | 0.51** | 26.4 | 21.7 | 0.81 | 342 |
| Different region to school | 92.0 | >90.9 | >0.89 | 93.1 | >90.9 | >0.79 | 324 |

Notes: The odds ratio is calculated as (probability a student with the characteristic is a top saver)/(probability a student without the characteristic is a top saver). Population percentages are expressed as bounds where affected by confidentialisation of values under 6. Asterisks denote the odds ratio is different to one at: * p<0.10, ** p<0.05, *** p<0.01, M p is missing.

**Appendix Table 2: Regressions of being a top saver on level of highest qualification for men**

| Dependent variable: | Student is a top cumulative saver | | | | Student is a top annual saver | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Age at NCEA level 2 | -0.022 | -0.029 | -0.026 | -0.032 | -0.043 | -0.049* | -0.047* | -0.050* |
| | (0.030) | (0.031) | (0.030) | (0.032) | (0.028) | (0.029) | (0.028) | (0.029) |
| Percentile score (0-1) | -0.064 | -0.053 | 0.067 | 0.007 | 0.278 | 0.159 | 0.261 | 0.173 |
| | (0.221) | (0.217) | (0.213) | (0.232) | (0.232) | (0.223) | (0.220) | (0.235) |
| Multiple specialties | -0.046 | -0.044 | -0.064 | -0.039 | -0.073* | -0.081* | -0.096** | -0.070 |
| | (0.046) | (0.046) | (0.044) | (0.047) | (0.043) | (0.044) | (0.043) | (0.045) |
| School decile | 0.017** | 0.018** | 0.018** | 0.017* | 0.019** | 0.016* | 0.016* | 0.015* |
| | (0.009) | (0.009) | (0.009) | (0.009) | (0.008) | (0.009) | (0.009) | (0.009) |
| School not in main urban area | 0.078* | 0.084* | 0.078* | 0.064 | 0.044 | 0.033 | 0.030 | 0.027 |
| | (0.047) | (0.047) | (0.046) | (0.048) | (0.045) | (0.046) | (0.044) | (0.047) |
| Highest qualification gained within 10 years (omitted category: level 2): | | | | | | | | |
| Level 3 | | 0.005 | -0.094* | -0.006 | | 0.015 | -0.059 | -0.005 |
| | | (0.060) | (0.054) | (0.060) | | (0.057) | (0.049) | (0.058) |
| Level 4 | | 0.036 | -0.181*** | 0.009 | | 0.107* | -0.077 | 0.089 |
| | | (0.056) | (0.055) | (0.056) | | (0.055) | (0.059) | (0.055) |
| Level 5 or 6 | | 0.192 | 0.094 | 0.171 | | 0.085 | -0.004 | 0.038 |
| | | (0.135) | (0.114) | (0.131) | | (0.117) | (0.099) | (0.118) |
| Level 7 | | -0.107 | -0.118 | -0.109 | | 0.017 | 0.006 | -0.020 |
| | | (0.085) | (0.084) | (0.097) | | (0.101) | (0.099) | (0.106) |
| Level 8 to 10 | | 0.011 | -0.010 | -0.064 | | 0.470** | 0.451** | 0.368 |
| | | (0.198) | (0.198) | (0.212) | | (0.227) | (0.226) | (0.231) |
| Highest industry training qualification gained within 10 years (omitted category: none): | | | | | | | | |
| Level 2 | | | -0.129*** | | | | -0.118*** | |
| | | | (0.036) | | | | (0.033) | |
| Level 3 | | | 0.367*** | | | | 0.273*** | |
| | | | (0.103) | | | | (0.098) | |
| Level 4 | | | 0.290*** | | | | 0.246*** | |
| | | | (0.060) | | | | (0.068) | |
| Level 5 or 6 | | | 0.383 | | | | 0.413 | |
| | | | (0.320) | | | | (0.371) | |
| Any Gateway credits completed within 10 years | | | | 0.007 | | | | -0.021 |
| | | | | (0.049) | | | | (0.048) |
| Enrolled in institute type within 10 years: | | | | | | | | |
| Industry Training Organisation | | | | 0.061 | | | | 0.026 |
| | | | | (0.046) | | | | (0.047) |
| Institute of Technology/Polytech | | | | 0.019 | | | | -0.006 |
| | | | | (0.066) | | | | (0.067) |
| Private Training Establishment | | | | 0.075 | | | | 0.145*** |
| | | | | (0.053) | | | | (0.047) |
| University | | | | 0.059 | | | | 0.066 |
| | | | | (0.077) | | | | (0.076) |
| Wānanga | | | | -0.014 | | | | 0.042 |
| | | | | (0.067) | | | | (0.077) |
| Other Tertiary Provider | | | | 0.142* | | | | 0.019 |
| | | | | (0.079) | | | | (0.072) |
| NCEA level 2 year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| R-squared | 0.021 | 0.036 | 0.129 | 0.061 | 0.037 | 0.065 | 0.127 | 0.089 |
| Observations | 342 | 342 | 342 | 342 | 342 | 342 | 342 | 342 |

Notes: This table presents the results of ordinary least squares regressions of dummy variables for being a top cumulative saver (columns 1-4) or top annual saver (columns 5-8) on educational controls. All regressions include dummies for missing school decile, missing percentile score, and missing school location. Standard errors are robust. Asterisks denote: * p<0.10, ** p<0.05, *** p<0.01.

**Appendix Table 3: Fields of study at school of men who are top savers**

| | Cumulative savings | | | Annual savings | | | |
|---|---|---|---|---|---|---|---|
| | % of students with characteristic among: | | Odds ratio | % of students with characteristic among: | | Odds ratio | Students |
| Characteristic | Non-top savers (1) | Top savers (2) | (3) | Non-top savers (4) | Top savers (5) | (6) | (7) |
| **Passed at least 14 credits at level 2 by year of NCEA level 2 in:** | | | | | | | |
| English | 26.4 | 22.7 | 0.85 | 25.0 | 31.8 | 1.31 | 342 |
| Maths | 13.0 | 18.2 | 1.36 | 12.0 | 22.7 | 1.80*** | 342 |
| Māori | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Humanities | 59.8 | 50.0 | 0.73 | 57.1 | 60.9 | 1.13 | 342 |
| Social Science | 7.5 | <8.3 | <1.09 | 5.5 | <8.3 | <1.40 | 342 |
| Science | 23.9 | 40.9 | 1.85*** | 23.9 | 40.9 | 1.85*** | 342 |
| **Passed at least 14 achievement standard credits at level 2 by year of NCEA level 2 in:** | | | | | | | |
| English | 7.6 | <8.7 | <1.12 | 5.4 | 17.4 | 2.48*** | 342 |
| Maths | 8.7 | 13.6 | 1.48 | 7.6 | 21.7 | 2.38*** | 342 |
| Māori | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Humanities | 25.8 | 22.7 | 0.87 | 23.1 | 30.4 | 1.34 | 342 |
| Social Science | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Science | 15.1 | 31.8 | 2.09*** | 13.2 | 36.4 | 2.66*** | 342 |
| **Passed at least 14 credits at level 3 within 5 years in:** | | | | | | | |
| English | 5.4 | 13.6 | 2.11** | 5.4 | 9.1 | 1.53 | 342 |
| Maths | 7.5 | 9.5 | 1.23 | 5.4 | 17.4 | 2.48*** | 342 |
| Māori | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Humanities | 14.3 | 18.2 | 1.25 | 14.1 | 21.7 | 1.50 | 342 |
| Social Science | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Science | 9.8 | 14.3 | 1.40 | 9.8 | 21.7 | 2.00** | 342 |
| Arts & Crafts | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Computing & IT | 6.5 | <9.1 | <1.34 | 5.4 | 9.1 | 1.53 | 342 |
| Business | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Agriculture, Forestry, & Fisheries | 13.0 | 13.6 | 1.04 | 14.1 | 13.0 | 0.93 | 342 |
| Community & Social Services | 7.6 | <8.7 | <1.12 | 7.6 | <8.7 | <1.12 | 342 |
| Education | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Service Sector | 16.1 | 33.3 | 2.09*** | 17.4 | 30.4 | 1.75*** | 342 |
| Engineering & Technology | 12.9 | 31.8 | 2.36*** | 11.0 | 31.8 | 2.64*** | 342 |
| Manufacturing, Planning & Constrn | 37.0 | 40.9 | 1.14 | 37.0 | 39.1 | 1.08 | 342 |
| **Passed at least 14 achievement standard credits at level 3 within 5 years in:** | | | | | | | |
| English | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Maths | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Māori | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Humanities | 8.7 | 9.5 | 1.08 | 7.6 | 17.4 | 1.99** | 342 |
| Social Science | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Science | 5.4 | 9.1 | 1.54 | 4.3 | 13.6 | 2.41*** | 342 |
| Arts & Crafts | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Computing & IT | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Business | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Agriculture, Forestry, & Fisheries | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Community & Social Services | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Education | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Service Sector | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Engineering & Technology | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Manufacturing, Planning & Constrn | <5% have characteristic | | | <5% have characteristic | | | 342 |

Notes: The odds ratio is calculated as (probability a student with the characteristic is a top saver)/(probability a student without the characteristic is a top saver). Population percentages are expressed as bounds where affected by confidentialisation of values under 6. Asterisks denote the odds ratio is different to one at: * p<0.10, ** p<0.05, *** p<0.01, M p is missing.

**Appendix Table 4: Fields of tertiary study of men who are top savers**

| | Cumulative savings | | | Annual savings | | | |
|---|---|---|---|---|---|---|---|
| | % of students with characteristic among: | | Odds ratio | % of students with characteristic among: | | Odds ratio | Students |
| Characteristic | Non-top savers (1) | Top savers (2) | (3) | Non-top savers (4) | Top savers (5) | (6) | (7) |
| **Fields and levels in which student passed at least 0.5 EFTS within 10 years:** | | | | | | | |
| Natural & Physical Sciences at level 2+ | 7.5 | <8.7 | <1.13 | 5.4 | 13.0 | 2.01* | 342 |
| Natural & Physical Sciences at level 4+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Natural & Physical Sciences at level 7+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Natural & Physical Sciences at level 8+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Information Technology at level 2+ | 6.5 | <8.7 | <1.29 | 6.5 | <8.3 | <1.24 | 342 |
| Information Technology at level 4+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Information Technology at level 7+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Information Technology at level 8+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Engineering & Related Technologies at level 2+ | 31.5 | 47.8 | 1.72** | 31.5 | 47.8 | 1.72*** | 342 |
| Engineering & Related Technologies at level 4+ | 11.0 | 30.4 | 2.50*** | 12.0 | 30.4 | 2.36*** | 342 |
| Engineering & Related Technologies at level 7+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Engineering & Related Technologies at level 8+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Architecture & Building at level 2+ | 38.0 | 36.4 | 0.94 | 37.4 | 40.9 | 1.13 | 342 |
| Architecture & Building at level 4+ | 24.7 | 27.3 | 1.11 | 23.9 | 30.4 | 1.30 | 342 |
| Architecture & Building at level 7+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Architecture & Building at level 8+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Ag, Environmental & Related Studies at level 2+ | 18.3 | 14.3 | 0.78 | 18.3 | 13.6 | 0.75 | 342 |
| Ag, Environmental & Related Studies at level 4+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Ag, Environmental & Related Studies at level 7+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Ag, Environmental & Related Studies at level 8+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Health at level 2+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Health at level 4+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Health at level 7+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Health at level 8+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Education at level 2+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Education at level 4+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Education at level 7+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Education at level 8+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Management & Commerce at level 2+ | 9.7 | <8.7 | <0.91 | 9.8 | <8.7 | <0.90 | 342 |
| Management & Commerce at level 4+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Management & Commerce at level 7+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Management & Commerce at level 8+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Society & Culture at level 2+ | 26.1 | 22.7 | 0.86 | 23.9 | 30.4 | 1.30 | 342 |
| Society & Culture at level 4+ | 9.7 | <8.7 | <0.91 | 8.7 | <8.7 | <1.00 | 342 |
| Society & Culture at level 7+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Society & Culture at level 8+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Creative Arts at level 2+ | 7.6 | <8.3 | <1.08 | 7.6 | <8.3 | <1.08 | 342 |
| Creative Arts at level 4+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Creative Arts at level 7+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Creative Arts at level 8+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Food, Hospitality & Personal Servs at level 2+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Food, Hospitality & Personal Servs at level 4+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Food, Hospitality & Personal Servs at level 7+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Food, Hospitality & Personal Servs at level 8+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Mixed Field Programmes at level 2+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Mixed Field Programmes at level 4+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Mixed Field Programmes at level 7+ | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Mixed Field Programmes at level 8+ | <5% have characteristic | | | <5% have characteristic | | | 342 |

Notes: The odds ratio is calculated as (probability a student with the characteristic is a top saver)/(probability a student without the characteristic is a top saver). Population percentages are expressed as bounds where affected by confidentialisation of values under 6. Asterisks denote the odds ratio is different to one at: * p<0.10, ** p<0.05, *** p<0.01, M p is missing.

**Appendix Table 5: Fields of tertiary qualification of men who are top savers**

| | Cumulative savings | | | Annual savings | | | |
|---|---|---|---|---|---|---|---|
| | % of students with characteristic among: | | Odds ratio | % of students with characteristic among: | | Odds ratio | Students |
| | Non-top savers | Top savers | | Non-top savers | Top savers | | |
| Characteristic | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| **Fields of highest qualification gained within 10 years:** | | | | | | | |
| Natural & Physical Sciences | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Information Technology | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Engineering & Related Technologies | 16.1 | 33.3 | 2.09*** | 15.4 | 39.1 | 2.54*** | 342 |
| Architecture & Building | 22.6 | 22.7 | 1.01 | 22.8 | 21.7 | 0.95 | 342 |
| Ag, Environmental & Related Studies | 7.6 | 9.1 | 1.17 | 7.6 | 13.0 | 1.58 | 342 |
| Health | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Education | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Management & Commerce | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Society & Culture | 7.6 | <8.3 | <1.08* | 7.7 | <8.3 | <1.07* | 342 |
| Creative Arts | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Food, Hospitality & Personal Services | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Mixed Field Programmes | 41.9 | 33.3 | 0.74 | 44.6 | 22.7 | 0.43*** | 342 |
| **Fields of qualifications at level 4+ gained within 10 years:** | | | | | | | |
| Natural & Physical Sciences | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Information Technology | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Engineering & Related Technologies | 12.9 | 27.3 | 2.02*** | 11.0 | 30.4 | 2.50*** | 342 |
| Architecture & Building | 19.6 | 22.7 | 1.16 | 19.6 | 22.7 | 1.16 | 342 |
| Ag, Environmental & Related Studies | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Health | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Education | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Management & Commerce | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Society & Culture | 5.4 | <8.7 | <1.47 | 5.5 | <8.3 | <1.40 | 342 |
| Creative Arts | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Food, Hospitality & Personal Services | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Mixed Field Programmes | <5% have characteristic | | | <5% have characteristic | | | 342 |
| **Fields of qualifications at bachelor's level+ gained within 10 years:** | | | | | | | |
| Natural & Physical Sciences | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Information Technology | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Engineering & Related Technologies | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Architecture & Building | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Ag, Environmental & Related Studies | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Health | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Education | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Management & Commerce | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Society & Culture | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Creative Arts | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Food, Hospitality & Personal Services | <5% have characteristic | | | <5% have characteristic | | | 342 |
| Mixed Field Programmes | <5% have characteristic | | | <5% have characteristic | | | 342 |

Notes: The odds ratio is calculated as (probability a student with the characteristic is a top saver)/(probability a student without the characteristic is a top saver). Population percentages are expressed as bounds where affected by confidentialisation of values under 6. Asterisks denote the odds ratio is different to one at: * p<0.10, ** p<0.05, *** p<0.01, M p is missing.

**Appendix Table 6: Regressions of being a top saver on field of higher study for men**

| Dependent variable: | **Student is a top cumulative saver** | | | **Student is a top annual saver** | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Passed at least 14 credits at level 3 within 5 years in: | | | | | | |
| Humanities | 0.007 | 0.031 | 0.015 | 0.028 | 0.060 | 0.071 |
| | (0.068) | (0.069) | (0.073) | (0.078) | (0.076) | (0.078) |
| Science | 0.116 | 0.132 | 0.140 | 0.116 | 0.098 | 0.064 |
| | (0.086) | (0.095) | (0.095) | (0.091) | (0.100) | (0.097) |
| Agriculture, forestry & fisheries | 0.045 | 0.049 | 0.029 | 0.039 | 0.050 | 0.021 |
| | (0.063) | (0.063) | (0.064) | (0.060) | (0.062) | (0.060) |
| Service sector | 0.164*** | 0.158*** | 0.158*** | 0.139** | 0.124** | 0.120** |
| | (0.060) | (0.060) | (0.061) | (0.056) | (0.056) | (0.056) |
| Engineering & technology | 0.252*** | 0.163** | 0.227*** | 0.274*** | 0.228*** | 0.272*** |
| | (0.070) | (0.075) | (0.077) | (0.070) | (0.077) | (0.079) |
| Manufacturing, planning & constrn | 0.060 | 0.063 | 0.061 | 0.059 | 0.006 | 0.018 |
| | (0.045) | (0.054) | (0.052) | (0.045) | (0.051) | (0.050) |
| # of other fields | -0.045 | -0.020 | -0.031 | 0.002 | 0.028 | 0.016 |
| | (0.035) | (0.037) | (0.037) | (0.041) | (0.042) | (0.042) |
| Passed at least 0.5 EFTS at level 4+ within 10 years in: | | | | | | |
| Engineering & Related Technologies | | 0.183** | | | 0.132 | |
| | | (0.089) | | | (0.086) | |
| Architecture & Building | | -0.003 | | | 0.104* | |
| | | (0.064) | | | (0.062) | |
| Management & Commerce | | 0.002 | | | -0.021 | |
| | | (0.112) | | | (0.109) | |
| Society & Culture | | -0.093 | | | -0.070 | |
| | | (0.088) | | | (0.094) | |
| # of other fields | | 0.020 | | | -0.021 | |
| | | (0.053) | | | (0.048) | |
| Passed at least 0.5 EFTS at level 7+ within 10 years in: | | | | | | |
| Engineering & Related Technologies | | -0.276 | | | 0.054 | |
| | | (0.169) | | | (0.190) | |
| Architecture & Building | | dropped | | | dropped | |
| Management & Commerce | | 0.423* | | | 0.448* | |
| | | (0.243) | | | (0.231) | |
| Society & Culture | | -0.127 | | | -0.197 | |
| | | (0.120) | | | (0.124) | |
| # of other fields | | -0.171*** | | | -0.137 | |
| | | (0.066) | | | (0.086) | |

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| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Gained qualification at level 4+ within 10 years in: | | | | | | |
| Engineering & Related Technologies | | | 0.051 | | | 0.045 |
| | | | (0.081) | | | (0.083) |
| Architecture & Building | | | -0.006 | | | 0.092 |
| | | | (0.069) | | | (0.065) |
| Society & Culture | | | -0.009 | | | -0.063 |
| | | | (0.120) | | | (0.128) |
| # of other fields | | | 0.062 | | | 0.060 |
| | | | (0.069) | | | (0.066) |
| Gained bachelor's degree+ within 10 years in: | | | | | | |
| Engineering & Related Technologies | | | -0.137 | | | 0.429** |
| | | | (0.262) | | | (0.216) |
| Architecture & Building | | | dropped | | | dropped |
| Society & Culture | | | -0.218* | | | -0.241* |
| | | | (0.131) | | | (0.142) |
| # of other fields | | | -0.210** | | | -0.087 |
| | | | (0.102) | | | (0.115) |
| NCEA level 2 year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Background characteristics | Yes | Yes | Yes | Yes | Yes | Yes |
| R-squared | 0.105 | 0.148 | 0.123 | 0.128 | 0.172 | 0.163 |
| Observations | 342 | 342 | 342 | 342 | 342 | 342 |

Notes: This table presents the results of ordinary least squares regressions of dummy variables for being a top cumulative saver (columns 1-3) or top annual saver (columns 4-6) on field of study controls. Background characteristics are the first five controls shown in Appendix Table 2. Fields of study controlled for are the more common fields. Standard errors are robust. Asterisks denote: * p<0.10, ** p<0.05, *** p<0.01.

**Appendix Table 7: Non-education characteristics of men who are top savers**

| | Cumulative savings | | | Annual savings | | | |
|---|---|---|---|---|---|---|---|
| | % of students with characteristic among: | | Odds ratio | % of students with characteristic among: | | Odds ratio | Students |
| | Non-top savers | Top savers | | Non-top savers | Top savers | | |
| Characteristic | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| **Years student had any children:** | | | | | | | |
| Fifth year after NCEA level 2 or earlier | 19.6 | 22.7 | 1.16 | 20.7 | 21.7 | 1.05 | 342 |
| Years 6 to 10 after NCEA level 2 | 34.4 | 39.1 | 1.18 | 34.8 | 39.1 | 1.16 | 342 |
| Years 11 to 12 after NCEA level 2 | 18.5 | 14.3 | 0.78 | 19.6 | 13.0 | 0.67 | 342 |
| **Years of early work experience:** | | | | | | | |
| Any work experience in year of NCEA level 2 or earlier | 19.6 | 54.5 | 3.36*** | 23.1 | 39.1 | 1.80** | 342 |
| Any work experience in years 1 to 5 after NCEA level 2 | 90.3 | >91.7 | >1.14M | 90.2 | >91.7 | >1.15* | 342 |
| Three+ years of work experience in years 1 to 5 | 69.9 | >90.9 | >3.53*** | 72.8 | 78.3 | 1.27 | 342 |
| **Sectors of work experience in years 1 to 5 after gaining NCEA level 2:** | | | | | | | |
| Central government in at least one year | 7.2 | 13.6 | 1.68 | 8.3 | 9.1 | 1.08 | 318 |
| Central government in at least 3 years | 6.2 | 10.0 | 1.46 | 7.5 | <11.1 | <1.39 | 255 |
| Other government in at least one year | 4.8 | 9.5 | 1.74* | 4.8 | 9.1 | 1.65* | 318 |
| Other government in at least 3 years | <5% have characteristic | | | <5% have characteristic | | | 255 |
| Non-profit organisation in at least one year | 8.4 | 13.6 | 1.50 | 8.4 | 13.6 | 1.50 | 318 |
| Non-profit organisation in at least 3 years | <5% have characteristic | | | <5% have characteristic | | | 255 |
| **Firm size of work experience in years 1 to 5 after gaining NCEA level 2:** | | | | | | | |
| Small employer (<10 employees) in at least one year | 46.4 | 33.3 | 0.64* | 42.2 | 47.8 | 1.20 | 318 |
| Small employer (<10 employees) in at least 3 years | 26.6 | 19.0 | 0.72 | 25.4 | 26.3 | 1.04 | 255 |
| Medium employer (10-99 employees) in at least one year | 48.8 | 33.3 | 0.59** | 50.0 | 30.4 | 0.52*** | 318 |
| Medium employer (10-99 employees) in at least 3 years | 26.6 | 26.3 | 0.99 | 27.3 | 27.8 | 1.02 | 255 |
| Large employer (100+ employees) in at least one year | 46.4 | 60.9 | 1.58** | 47.0 | 59.1 | 1.47 | 318 |
| Large employer (100+ employees) in at least 3 years | 28.1 | 47.4 | 1.87*** | 29.9 | 47.4 | 1.77** | 255 |
| **Industries of work experience in years 1 to 5 after gaining NCEA level 2:** | | | | | | | |
| Agriculture, Forestry, Fishing in at least one year | 15.5 | 9.1 | 0.61 | 15.7 | <8.7 | <0.58* | 318 |
| Agriculture, Forestry, Fishing in at least 3 years | 7.7 | <9.5 | <1.19 | 7.6 | <10.5 | <1.31 | 255 |
| Manufacturing in at least one year | 26.2 | 22.7 | 0.86 | 27.4 | 22.7 | 0.82 | 318 |
| Manufacturing in at least 3 years | 15.4 | 19.0 | 1.21 | 16.4 | 15.8 | 0.96 | 255 |
| Construction in at least one year | 38.6 | 42.9 | 1.15 | 38.1 | 47.8 | 1.36* | 318 |
| Construction in at least 3 years | 24.2 | 35.0 | 1.47* | 21.2 | 42.1 | 2.08*** | 255 |
| Wholesale Trade in at least one year | <5% have characteristic | | | <5% have characteristic | | | 318 |
| Wholesale Trade in at least 3 years | <5% have characteristic | | | <5% have characteristic | | | 255 |
| Retail Trade in at least one year | 15.7 | 9.5 | 0.62 | 16.7 | 9.1 | 0.56 | 318 |
| Retail Trade in at least 3 years | 7.7 | <9.5 | <1.19 | 7.6 | <10.0 | <1.25M | 255 |
| Accommodation & Food Services in at least one year | 8.2 | <8.7 | <1.05 | 8.3 | <8.3 | <1.00* | 318 |
| Accommodation & Food Services in at least 3 years | <5% have characteristic | | | <5% have characteristic | | | 255 |
| Transport, Post, Warehousing in at least one year | 6.0 | <8.7 | <1.36 | 6.0 | <8.7 | <1.36 | 318 |
| Transport, Post, Warehousing in at least 3 years | <5% have characteristic | | | <5% have characteristic | | | 255 |
| Financial & Insurance Services in at least one year | <5% have characteristic | | | <5% have characteristic | | | 318 |
| Financial & Insurance Services in at least 3 years | <5% have characteristic | | | <5% have characteristic | | | 255 |
| Professional, Scientific, Technical Services in at least 1 year | <5% have characteristic | | | <5% have characteristic | | | 318 |
| Professional, Scientific, Technical Services in at least 3 years | <5% have characteristic | | | <5% have characteristic | | | 255 |
| Administrative & Support Services in at least one year | 10.8 | <8.3 | <0.79M | 10.7 | <8.3 | <0.80* | 318 |
| Administrative & Support Services in at least 3 years | <5% have characteristic | | | <5% have characteristic | | | 255 |
| Public Administration & Safety in at least one year | 8.4 | 13.6 | 1.50 | 9.5 | 9.1 | 0.96 | 318 |
| Public Administration & Safety in at least 3 years | 7.7 | 15.0 | 1.70 | 7.6 | 10.5 | 1.31 | 255 |
| Education & Training in at least one year | <5% have characteristic | | | <5% have characteristic | | | 318 |
| Education & Training in at least 3 years | <5% have characteristic | | | <5% have characteristic | | | 255 |
| Health Care & Social Assistance in at least one year | <5% have characteristic | | | <5% have characteristic | | | 318 |
| Health Care & Social Assistance in at least 3 years | <5% have characteristic | | | <5% have characteristic | | | 255 |
| Arts & Recreation Services in at least one year | <5% have characteristic | | | <5% have characteristic | | | 318 |
| Arts & Recreation Services in at least 3 years | <5% have characteristic | | | <5% have characteristic | | | 255 |
| Other industry in at least one year | 8.4 | 13.6 | 1.50 | 8.5 | 13.6 | 1.48 | 318 |
| Other industry in at least 3 years | 4.7 | <9.5 | <1.68 | 4.5 | <11.1 | <2.00 | 255 |

Notes: Employment counts as work experience if it is by the highest-paying employer in the year and wages are at least $10,000. Work experience in at least one year characteristics are defined only for those with at least a year of work experience. Work experience in at least three years characteristics are defined only for those with at least three years of work experience. The odds ratio is calculated as (probability a student with the characteristic is a top saver)/(probability a student without the characteristic is a top saver). Population percentages are expressed as bounds where affected by confidentialisation of values under 6. Asterisks denote the odds ratio is different to one at: * p<0.10, ** p<0.05, *** p<0.01, M p is missing.

**Appendix Table 8: Regressions of being a top saver on pathways outside education for men**

| Dependent variable: | Student is a top cumulative saver | | | Student is a top annual saver | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Any children born in year relative to NCEA level 2: | | | | | | |
| Year 5 or earlier | 0.008 | 0.022 | 0.024 | -0.001 | 0.007 | 0.002 |
| | (0.054) | (0.052) | (0.053) | (0.051) | (0.050) | (0.052) |
| Years 6 to 10 | 0.075 | 0.054 | 0.053 | 0.110** | 0.099** | 0.102** |
| | (0.046) | (0.045) | (0.047) | (0.046) | (0.044) | (0.046) |
| Years 11 and 12 | -0.028 | -0.036 | -0.015 | -0.050 | -0.065 | -0.042 |
| | (0.056) | (0.053) | (0.056) | (0.050) | (0.048) | (0.052) |
| Overseas at least 6 months in year relative to NCEA level 2: | | | | | | |
| Any year 3 to 5 | -0.053 | 0.026 | 0.019 | -0.049 | -0.009 | -0.023 |
| | (0.083) | (0.093) | (0.087) | (0.072) | (0.069) | (0.072) |
| Any year 6 to 10 | -0.011 | 0.012 | 0.002 | 0.053 | 0.060 | 0.069 |
| | (0.069) | (0.070) | (0.072) | (0.071) | (0.068) | (0.071) |
| Year 11 or 12 | 0.173* | 0.151 | 0.153* | 0.335*** | 0.320*** | 0.310*** |
| | (0.089) | (0.092) | (0.092) | (0.093) | (0.090) | (0.092) |
| Years of work experience in years 1 to 5 after NCEA level 1 (omitted category: 0): | | | | | | |
| 1 | | 0.072 | 0.111 | | 0.130* | 0.116 |
| | | (0.087) | (0.086) | | (0.075) | (0.075) |
| 2 | | -0.045 | 0.044 | | 0.105 | 0.133 |
| | | (0.071) | (0.078) | | (0.079) | (0.082) |
| 3 | | 0.053 | 0.138 | | 0.098 | 0.122 |
| | | (0.081) | (0.086) | | (0.077) | (0.081) |
| 4 | | 0.068 | 0.125 | | 0.146* | 0.127* |
| | | (0.078) | (0.077) | | (0.076) | (0.072) |
| 5 | | 0.243*** | 0.318*** | | 0.189*** | 0.202*** |
| | | (0.077) | (0.082) | | (0.068) | (0.073) |
| Any work experience in years 1 to 5 in: | | | | | | |
| Central government | | -0.011 | | | -0.101 | |
| | | (0.088) | | | (0.091) | |
| Medium-sized firm (10-99 employees) | | -0.085* | | | -0.156*** | |
| | | (0.049) | | | (0.045) | |
| Large firm (100+ empployees) | | 0.091* | | | 0.060 | |
| | | (0.047) | | | (0.046) | |
| Agriculture, Forestry & Fishing | | | -0.105* | | | -0.110* |
| | | | (0.063) | | | (0.060) |
| Manufacturing | | | -0.038 | | | -0.071 |
| | | | (0.055) | | | (0.054) |
| Construction | | | -0.015 | | | 0.036 |
| | | | (0.052) | | | (0.054) |
| Retail Trade | | | -0.051 | | | -0.058 |
| | | | (0.062) | | | (0.056) |
| Accommodation & Food Services | | | -0.166** | | | -0.192*** |
| | | | (0.070) | | | (0.062) |
| Administrative & Support Services | | | -0.112** | | | -0.039 |
| | | | (0.045) | | | (0.058) |
| Public Administration & Safety | | | 0.022 | | | -0.028 |
| | | | (0.084) | | | (0.084) |
| NCEA level 2 year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Background characteristics | Yes | Yes | Yes | Yes | Yes | Yes |
| Level of highest qualification fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Fields of study controls | Yes | Yes | Yes | Yes | Yes | Yes |
| R-squared | 0.186 | 0.267 | 0.262 | 0.275 | 0.326 | 0.306 |
| Observations | 342 | 342 | 342 | 342 | 342 | 342 |

Notes: This table presents the results of ordinary least squares regressions of dummy variables for being a top cumulative saver (columns 1-3) or top annual saver (columns 4-6) on pathways outside education. Fields of study controls are those presented in column 2 of Appendix Table 6. Employment counts as work experience if it was for the highest paying employer in the year and at least $10,000 of wages were paid. Standard errors are robust. Asterisks denote: * p<0.10, ** p<0.05, *** p<0.01.