



**MINISTRY OF BUSINESS,
INNOVATION & EMPLOYMENT**
HĪKINA WHAKATUTUKI

The Migration Patterns of Industry Trainees



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Important notes on the data

This paper was undertaken while the authors were in Statistics New Zealand's DataLab. The results in this report are not official statistics. They have been created for research purposes from the Integrated Data Infrastructure (IDI) prototype 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.

The opinions, findings, recommendations and conclusions expressed in this report are those of the authors. Statistics New Zealand and the Ministry of Business, Innovation and Employment (the Ministry) take no responsibility for any omissions or errors in the information contained here.

Access to the 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, business or organisation. The results in this report have been confidentialised to protect individual people and businesses from identification.

Careful consideration has been given to the privacy, security and confidentiality issues associated with using administrative data in the IDI prototype. Further detail can be found in the Privacy impact assessment for the Integrated Data Infrastructure, available from www.stats.govt.nz/browse_for_stats/snapshots-of-nz/integrated-data-infrastructure/privacy-impact-assessment-for-the-idi.aspx.

The results are based in part on tax data supplied by Inland Revenue to Statistics New Zealand under the Tax Administration Act 1994. This 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 prototype for statistical purposes and is not related to the data's ability to support Inland Revenue's core operational requirements.

Executive summary

Purpose and key question

This report presents new statistics on the extent to which industry trainees leave and return to New Zealand. For New Zealand industry trainees who completed a qualification in either 2003 or 2004, it examines their migration patterns over the subsequent 7 years post-completion.

We are interested in better understanding the extent to which industry trainees leave New Zealand after completing their study and therefore do not contribute to New Zealand's human capital. There are concerns that some types of industry trainees (for example, those who have trained to work in the building industry) are attracted to Australia, and the skills they accumulate are therefore lost to the New Zealand economy. Knowing the extent to which this happens can help us better understand the factors associated with availability of different types of skills. This is a particularly important issue currently as building companies seek skilled labour for the Canterbury rebuild.

Key indicators

Our first two indicators look at the migration decisions that industry trainees make: whether to leave New Zealand for an extended period and, for those who do leave, whether to return or not. Our third measure looks to show the net effect¹ of these two decisions after 7 years. This last indicator is a deliberately conservative measure of those still away – the closest we can get, given our data, to estimating the proportion of trainees who leave New Zealand permanently. We measure:

- leaving – the proportion of all industry trainees who left New Zealand for a year or more in the 7 years after completing their qualification
- returning – the proportion of industry trainees who left New Zealand in the first 2 years after completing their qualification who were back in New Zealand in years 4 and 5 after leaving
- still away – the proportion of all industry trainees who were abroad 7 years after completing their qualification and had been for at least the last 3 years.

Main findings

Our main findings are summarised below:

- Around one in six industry trainees (17.2 per cent) left New Zealand in the 7 years after completing their qualification. This is lower than the leaving rate for tertiary graduates (25.9 per cent) but higher than the rate for the New Zealand population (11.0 per cent).
- Of those who left in the 2 years after completion, around a third (33.9 per cent) were back in New Zealand 4 years later. This is a higher rate of return than for tertiary graduates, of whom only one in four had returned after 4 years. It is also a slightly higher rate than for the New Zealand population, of whom around 30 per cent had returned. We speculate that the skills and work experience obtained through industry training means that trainees can earn

¹ Our three indicators were each separately defined to make the best use of the 7-year window that we had to observe post-training migration behaviour. They are not designed to exactly reconcile with each other (i.e. subtracting the proportion returning from the proportion leaving will not give the proportion still away).

high wages in overseas labour markets more quickly than tertiary graduates, enabling them to return to New Zealand earlier.

- Of all trainees, 9.1 per cent were abroad 7 years later and had been abroad for at least 3 years. This is less than the rate for tertiary graduates (15.1 per cent) but higher than the rate for the New Zealand population (6.1 per cent).

Table A shows that some, but not all, of the differences in the extent industry trainees, tertiary graduates and New Zealanders as a whole go overseas are explained by the different age profiles of these populations, as younger people are more likely to leave New Zealand. In addition, industry trainees complete qualifications at lower levels on average than tertiary graduates, because training is mostly at levels 1 to 4, and people with higher-level qualifications are more likely to go overseas. We did not formally model the differences in leaving and returning rates between industry trainees and other tertiary graduates, and this would be an interesting topic for further analysis. We did compare industry trainees and tertiary graduates who completed level 4 qualifications and found that, after controlling for their differing age profiles, their proportions abroad after 7 years were very similar.

Level of qualification

The likelihood of leaving New Zealand is associated with the level of the qualification, rising from around 10–11 per cent for those completing Limited Credit Programmes or level 1 qualifications to 23.4 per cent for those completing level 4 qualifications. The differences across levels in the proportions abroad 7 years after study are smaller, partly because, although trainees completing level 4 qualifications were more likely to leave, they were also more likely to return.

Table A: Main finding by level of qualification (unadjusted)

Level of qualification	Number of industry trainees ¹	% of all trainees who leave	% of leaving trainees who return	% of all trainees still away
Limited Credit Programme	3,573	10.7	32.6	6.0
Level 1	642	10.3	...	6.1
Level 2	3,861	16.6	27.3	8.7
Level 3	5,490	15.2	27.3	8.9
Level 4	7,065	23.4	39.4	11.6
All trainees	20,886	17.2	33.9	9.1
Tertiary graduates²				
Unadjusted		25.9	25.6	15.1
Adjusted to industry training age profile		22.5	25.5	13.3
NZ population³				
Unadjusted		11.0	28.8	6.1
Adjusted to industry training age profile		13.3	29.8	7.4

Notes: Figures have been extracted from the IDI prototype managed by Statistics New Zealand. (1) Industry trainees, including Modern Apprentices, who completed a qualification and subsequently left industry training in 2003 or 2004. (2) Tertiary graduates who completed a qualification in 2003. (3) The New Zealand population in 2003 aged 17–59 years.

Table B adjusts these findings for observable differences between trainees in their personal and study characteristics. This tends to reduce the differences across levels in the likelihood of leaving New Zealand, returning again and (especially) being abroad 7 years later. Those completing level 4 qualifications still left New Zealand, and returned again, at higher rates than those completing lower-level qualifications.

Table B: Main finding by level of qualification (adjusted)

Level of qualification	Number of industry trainees ¹	% of all trainees who leave	% of leaving trainees who return	% of all trainees still away
Limited Credit Programme	3,573	14.5	38.3	7.9
Level 1	642	11.5	...	6.1
Level 2	3,861	16.4	27.3	8.8
Level 3	5,490	16.2	30.9	9.2
Level 4	7,065	19.7	36.8	9.9
All trainees	20,886	17.2	33.9	9.1

Notes: Figures have been extracted from the IDI prototype managed by Statistics New Zealand. They have been adjusted to take account of observable differences between trainees in terms. (1) Industry trainees, including Modern Apprentices, who completed a qualification and subsequently left industry training in 2003 or 2004.

Field of study

In unadjusted terms, those who completed a level 4 qualification in engineering or building were more likely to be abroad 7 years later (around 14–15 per cent) compared to other fields of study (around 6–8 per cent). This is mostly due to trainees in these fields being more likely to be young and male, and once we control for this, these differences across fields diminish. In terms of the study industry, trainees in transport, postal and warehousing; construction; and arts and recreation were more likely to be abroad 7 years later, after controlling for other variables.

Other characteristics

There are a number of other characteristics that affect the migration patterns of industry trainees in a similar way to tertiary graduates, even after controlling for other differences. Being young, male, non-New Zealand European or having a leaving student loan balance are all associated with an increased likelihood of being abroad 7 years later.

Other findings

Those who undertook Modern Apprenticeships and left New Zealand were significantly less likely to be back in New Zealand 4 years later, after controlling for other variables, than other industry trainees.

Industry trainees tended to leave for Australia at a similar rate to tertiary graduates but had a lower departure rate to other destinations. Those who moved to Australia were less likely to return than those who migrated elsewhere. We would expect this effect given that it is easier for New Zealanders to stay for extended periods in Australia than in other countries.

Migration is influenced by a number of factors, including the prevailing economic conditions in New Zealand and Australia, which means that the main findings may not hold in different economic climates. To look at this, and to provide more up-to-date estimates, the report compared the migration patterns of different leaving cohorts of industry trainees. This seems to show some effect of changing economic conditions. The proportions who were overseas 2 years after completing their qualification increased from 11.6 per cent for the 2003 cohort to 13.9 per cent for the 2007 cohort. This fell back to 11.5 per cent for the 2009 cohort which was probably due, to some extent, to the impact of the global financial crisis.

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1. Introduction

Industry training

Industry training describes training activity funded by government through the Industry Training Fund and the Modern Apprenticeships programme.² Training occurs in the workplace and is mainly set at levels 1 to 4 of the New Zealand Qualifications Framework (NZQF). Skills accrual is measured through a competency-based standards assessment method, linked to the New Zealand Qualifications Framework. Training is intended to lead to national qualifications registered on this framework.

Funding for training is administered by the Tertiary Education Commission (TEC) and is mainly distributed to industry training organisations (ITOs). ITOs use these funds to develop qualifications that meet industry requirements for skills and arrange for training and assessment to occur. ITOs are not registered training providers, so they cannot provide training, but they support training in the workplace through a number of means such as contracting with tertiary education institutions and private registered training organisations to provide theory and other off-job training components to supplement on-job training. Training is co-funded by industry, with a government contribution of 70 per cent, and there is a mandated requirement that employers meet the remaining 30 per cent of the cost. Government funds training at a set price per equivalent full-time student load.

There are two broad types of training, described as traineeships and apprenticeships. There is no official definition of these, but the term ‘apprenticeship’ is generally used to describe training that is intended to lead to a qualification at levels 3, 4 or above and is reasonably substantial, consisting of 100 or more credits, while a traineeship is shorter and generally at a lower framework level. Apprenticeship activity is funded through both the Industry Training Fund and the Modern Apprenticeships programme, while traineeships are funded through the Industry Training Fund only. The Modern Apprenticeships programme aims to encourage young people to participate in apprenticeship-style training and provides additional supports such as brokerage, co-ordination and peer support services to overcome any additional barriers for young people in training.

Some programmes, such as Limited Credit Programmes (LCPs), do not directly lead to national qualifications. LCPs are small collections of standards that aim to introduce employers and employees to the concept of industry training. Credits awarded in LCPs can be subsequently directed to qualifications. LCPs only occur in industry training – they are not available for Modern Apprentices.

Motivation

We are interested in better understanding the extent to which industry trainees leave New Zealand after completing their study and therefore do not contribute to New Zealand’s human capital. There

² The industry training sector has undergone a government-initiated policy review and faces some changes in the future as a result of this. This paper is retrospective so describes industry training as it was between 2001 to 2010, before the changes, which are detailed here:

<http://www.minedu.govt.nz/NZEducation/EducationPolicies/TertiaryEducation/PolicyAndStrategy/ReviewIndustryTraining/FinalDecisionsIndustryTrainingCabPaper.aspx>

have been concerns that some types of industry trainees (for example, in building) are attracted to Australia. Knowing the extent to which this is happening can help better understand the availability of different types of skills (for example, for the Canterbury rebuild).

Who left, who returned and who was still away?

This study replicates Papadopoulos (2012), which looked at the migration patterns of provider-based tertiary education graduates to determine if there are any differences between those graduates and workplace-based industry training completers leaving and returning to New Zealand.

Papadopoulos found that more than a quarter (25.9 per cent) of 2003 domestic tertiary graduates left New Zealand between 2004 and 2010 for a year or more. Of those who left in 2004 or 2005, around a quarter (25.6 per cent) returned to New Zealand 4 years later. Of all 2003 graduates, 15.1 per cent were abroad 7 years later and had been abroad for at least 3 years. The likelihood that a graduate left New Zealand and the likelihood that they were abroad 7 years later increased strongly with the level of their qualification. The relationship between qualification level and the likelihood of return after 4 years was weaker.

2. Data

2.1 Data source

This report makes use of administrative data linked together in Statistics New Zealand's Integrated Data Infrastructure (IDI) prototype. In particular, it uses study data on industry trainees, tax data on their earnings and student loan balances, business register data on their employers and administrative data on their movements in and out of New Zealand. These datasets are linked through the Inland Revenue data that is at the core of the IDI prototype. Records are linked using name, date of birth and sex. Probabilistic linking is used to determine the likelihood that two records from different files belong to the same person. For more information on the IDI prototype, see Statistics New Zealand (2012).

As this report examines migration patterns, the quality of the link of international movements to the Inland Revenue data is particularly important. This link seems to be of high quality. The international movements data is based on passport information so has high-quality demographic information. Initial estimates by Statistics New Zealand of the proportion of New Zealand citizens in the international movements data who should have been linked to the IDI prototype but weren't (i.e. the false negative rate) is around 2–5 per cent. Statistics New Zealand estimates that only around 0.3 per cent of New Zealand citizens in the international movements data are matched to the wrong person (i.e. the false positive rate). In our analysis, we remove those who appear to have travelled on a non-New Zealand passport prior to leaving study. There appears to be a higher false positive rate for this group.

The integrated dataset contains information on qualifications (level of qualification and field of study) as well as some information on the industry trainee (age, sex, ethnicity, student loan balance, earnings) and their employer. It does not contain information on their country of birth or the number of years the student spent out of New Zealand before 1998, but we can observe whether the student travelled on a non-New Zealand passport between 1998 and 2012. We cannot observe final destination for students that leave New Zealand, but we can observe where the plane disembarked. There are a number of variables that are likely to help explain people's migration decisions, which are missing from the dataset. We discuss these matters further in section 3.

2.2 Population

The industry training data consists of annual summaries of trainee participation and achievement data provided by ITOs to the Tertiary Education Commission for reporting purposes. It includes information on participants in the Modern Apprenticeships programme.

In defining the population of this report, we wanted to be as close as possible to Papadopoulos (2012) to allow comparisons with the results from that paper on migration patterns for graduates from tertiary education institutions. We therefore defined our population of interest as industry trainees, including Modern Apprentices, who completed a qualification and subsequently left

industry training in either 2003 or 2004.³ These years allow us the same 7-year post-completion migration window. We cannot look earlier than 2003, as the industry training data is incomplete before then.

Since trainees and apprentices can gain multiple qualifications during training, level of qualification refers to the highest level of qualification achieved.

The left-hand columns of Table 1⁴ show how the population is derived. The first row shows the total number of trainees who left industry training in either 2003 or 2004 was 43,241. Of these, 96 per cent were matched in the IDI prototype. Around 1,100 of the trainees who were matched were removed from the population because they appeared to receive no earnings from wages and salaries or self-employment during the period of training.⁵

We also exclude a further 2,000 trainees who appeared to spend a year or more out of New Zealand on a non-New Zealand passport before leaving study. This was done to lessen the influence of strong pre-existing relationships to another country, and unit record analysis also suggested that many of these trainees had in fact been incorrectly matched in the IDI prototype to short-term overseas visitors. Table 1 shows that this group appears to spend far more time outside New Zealand after leaving training than other trainees.

Of those 40,056 trainees remaining, around 55 per cent completed a qualification before they left training. These 21,735 completers are the focus of most of the rest of the analysis in this report.

Table 1 shows that, compared to non-completers, completers spent less time outside of New Zealand post-training. This is the opposite of the situation for tertiary graduates (Papadopoulos, 2012). This may be due to industry trainees who complete qualifications being more likely to still be in employment after leaving training and therefore being less likely to leave New Zealand. Previous research by Crichton (2012) found that trainees who completed a qualification were slightly more likely to be employed 1 year and 3 years after completing training than equivalent non-industry training participants.

Non-completion of qualifications may occur for different reasons in industry training than in provider-based tertiary education. Some people participate in training or provider-based tertiary education without intending to gain a qualification. Industry trainees, or their employers, may use the industry training system as a means to gain small sets of skills to benefit their current employment or business.⁶ In contrast, people who do portions of provider-based qualifications may

³ Trainees are defined as having left industry training if they are either not enrolled in the following year (T+1), or enrolled in the following year (T+1) but gain no credits or qualification in that year and are also not enrolled in the next year (T+2).

⁴ Tables 1–9 appear at the end of this report.

⁵ Inspection of the unit record data seemed to suggest that many of these trainees had been matched to the wrong taxpayer information in the IDI prototype. This suggests that the false positive rate for industry trainees who completed a qualification in 2003 or 2004 is higher than Statistics New Zealand's estimate of 0.26 per cent across all education data linked to the IDI. This estimate includes the matching of secondary and tertiary students and across more recent cohorts. It may be that the quality of matching information for cohorts of industry trainees back in 2003/04 is of lesser quality than more recent cohorts.

⁶ See Mahoney (2012b) for more information.

not necessarily be working in the occupation they are studying towards, so there is a different intention behind the study and training event. Either way, this sort of non-completing participation does not infer an 'educational experience' of a comparable type to those who participated with the intention to gain qualifications, and this is one of the reasons non-completers are generally excluded from this analysis.

In general, match rates for completers increase with the level of the qualification and are higher for younger students and for those of European ethnicity.

2.3 Defining extended periods out of New Zealand

To measure the extent to which trainees leave and return to New Zealand, we need a measure that is similar to that used in official statistics on permanent and long-term (PLT) departures.⁷ PLT departure statistics are based on travellers' intentions, as recorded on departure cards.

The IDI prototype does not currently contain data from arrival and departure cards.⁸ Instead, it contains passport and flight data on all international movements into and out of New Zealand. By linking these movements together, it is possible to accurately see when someone leaves New Zealand and whether they return.

In some ways, this is better than having arrival and departure cards. People's intentions can change after they leave, and what was intended to be a PLT departure doesn't turn out to be or vice versa (i.e. 'category jumping'). The international movements data records actual behaviour so is not affected by this. Instead of measuring if someone is a PLT migrant, we can identify if someone is out of New Zealand for some extended period.

So how best to define this extended period? We follow the rule used in Papadopoulos (2012):

- Those in New Zealand in one year who spend 75 per cent or more of the subsequent year out of New Zealand are defined as being abroad in the subsequent year.
- Those out of New Zealand in one year who spend 75 per cent or more of the subsequent year back in New Zealand are defined as being in New Zealand in the subsequent year.

The Australian Bureau of Statistics (2010) applies a similar 75 per cent threshold when calculating the impact of net overseas migration on their population estimates. To overcome 'category jumping', the Australian Bureau of Statistics excludes an Australian from the resident population if they are away from Australia for 12 months or more over a 16-month period.

Given the absence of arrival and departure cards in the IDI prototype at the time of this study and the differing populations, it is not possible to directly compare this method with that used to produce official statistics on PLT migration. However, comparisons of departure rates, after excluding overseas visitors from the PLT numbers, seem to suggest that our method produces a departure rate that is slightly higher than the official one (by around 5–10 per cent).

⁷ Those departing for an intended period of 12 months or more are defined as PLT departures.

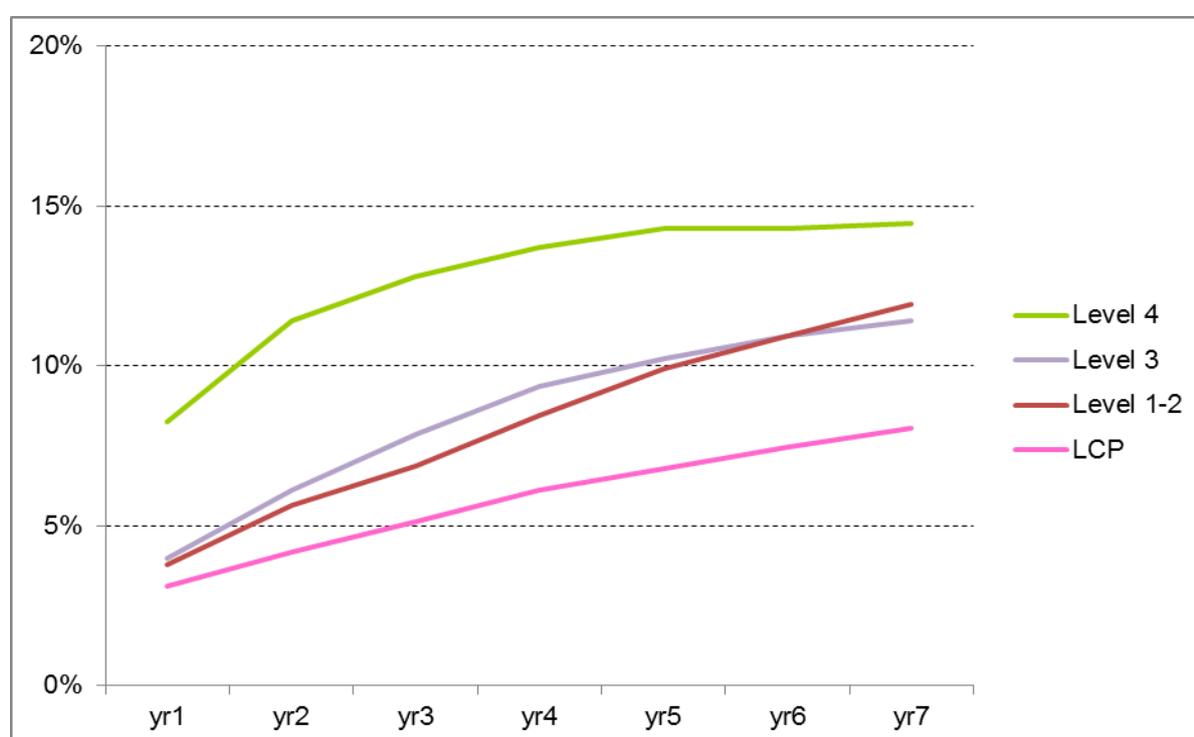
⁸ Statistics New Zealand has subsequently linked information from arrival and departure cards into the IDI, so this will be available for future analyses.

3. Descriptive statistics

3.1 The proportion overseas

Figure 1 shows how the proportion of our population of interest (industry trainees who completed a qualification and subsequently left industry training in either 2003 or 2004) increased over the 7 years post-completion that we could observe. The likelihood of being overseas seems to increase with the level of the qualification. Nearly 15 per cent of those who completed a level 4 qualification⁹ were overseas 7 years after completion, compared to 11–12 per cent for level 1–3 qualifications and 8 per cent for those who completed a Limited Credit Programme (LCP).¹⁰

Figure 1: Proportion out of New Zealand, by qualification level



Source: Figures have been extracted from the IDI prototype managed by Statistics New Zealand.

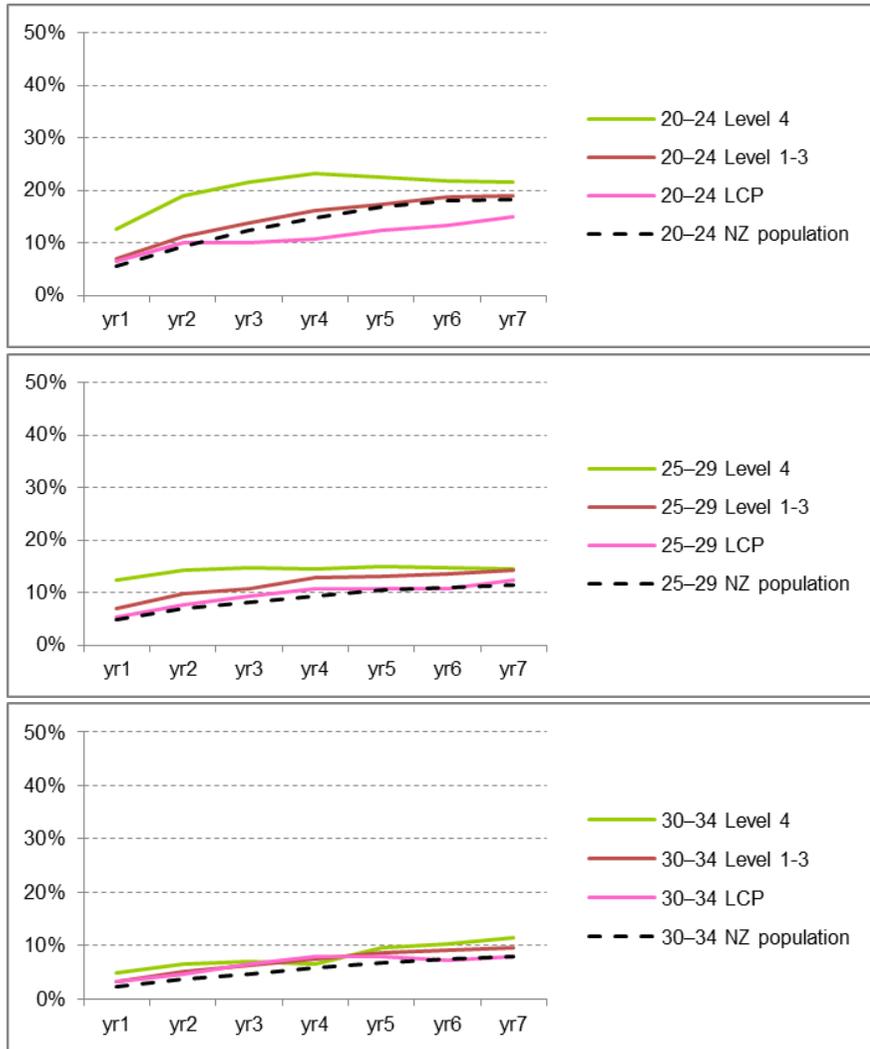
Official PLT statistics and Papadopoulos (2012) both show that likelihood of leaving New Zealand for significant periods declines with age. Table 1 shows that this relationship also holds for our population of industry trainees. Figure 2 displays this relationship graphically, for both industry trainees and tertiary graduates. Across all qualification levels, older industry trainees and tertiary graduates are less likely to leave New Zealand after completion than their younger counterparts.

⁹ In Figures 1 and 2, the level 4 group of industry trainees also contains a small number of industry trainees (around 4 per cent) with a higher-level qualification.

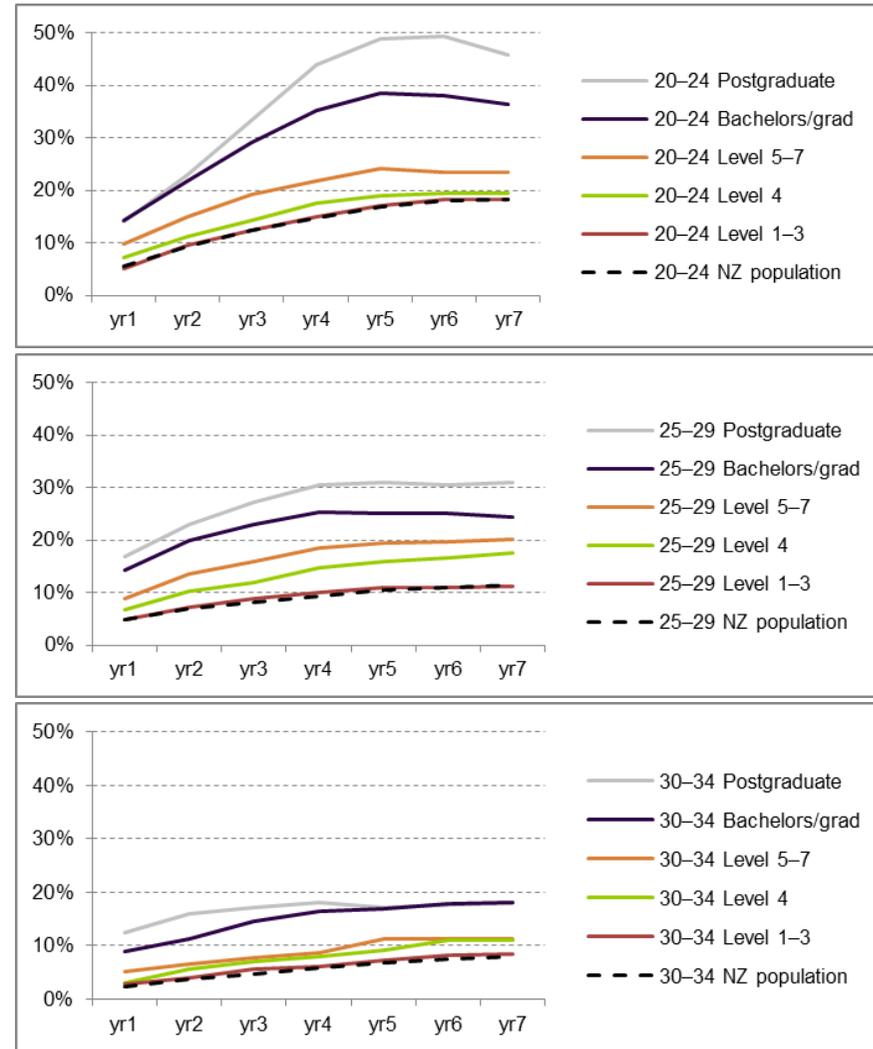
¹⁰ LCPs are small collections of standards intended to introduce trainees and employers to the concept of industry training. They do not of themselves confer a national qualification on completion, but credits gained in them can be used as credit supplements in qualifications-based programmes. LCPs can be completed at various NZQF levels. For more information on LCPs, see Mahoney (2012a).

Figure 2: Proportion out of New Zealand, by qualification level and age group

Industry trainees



Tertiary graduates

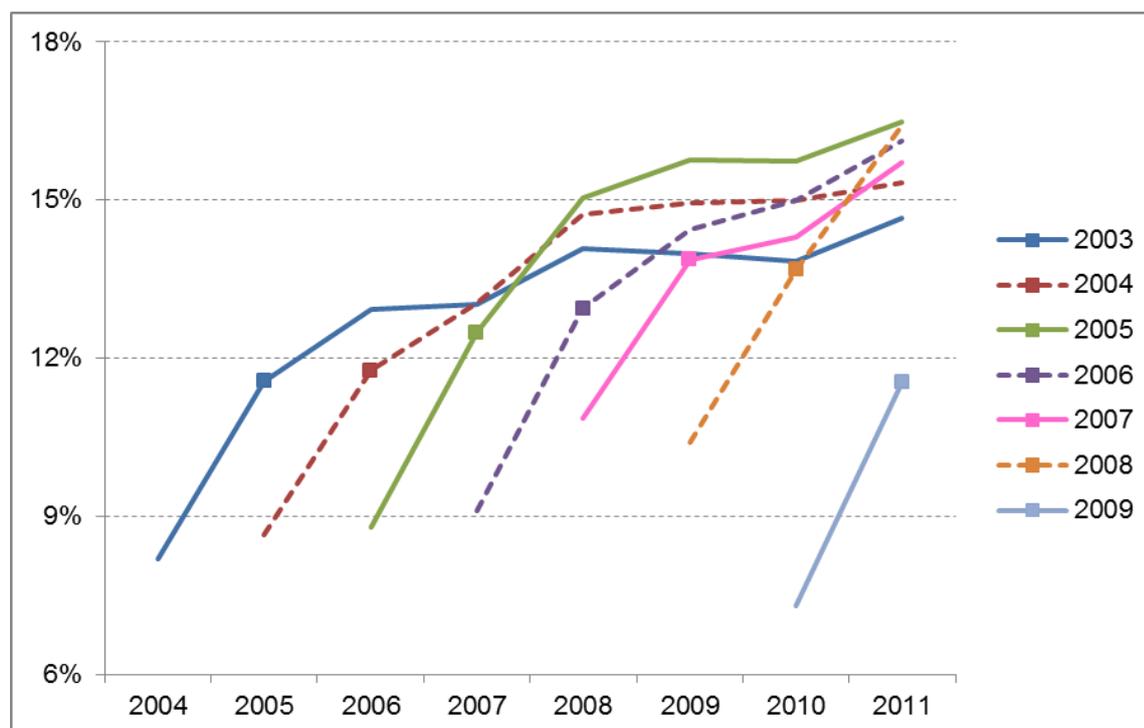


Source: Figures have been extracted from the IDI prototype managed by Statistics New Zealand.

Comparing industry trainees and tertiary graduates,¹¹ industry trainees aged 20–29 years who completed a level 4 qualification were overseas at higher rates than level 4 tertiary graduates in the first few years after study. In fact, they were overseas at similar rates to postgraduate and bachelor’s graduates. However, by year 7 after study, their rates overseas had flattened out and were similar to those for level 4 tertiary graduates. By year 7, they also had similar rates overseas to industry trainees at lower levels. As we will see later, young level 4 industry trainees tend to leave New Zealand earlier and then return quicker than other types of trainees and graduates.

The diagrams also contain estimates of the proportion of all New Zealanders overseas in each age group.¹² Industry trainees and tertiary graduates who completed level 1–3 qualifications seem to have been overseas at similar rates to other New Zealanders. For industry trainees aged 20–24 years, those who completed a level 4 qualification or higher were more likely to be overseas than other New Zealanders in that age group, whereas those who completed an LCP qualification were less likely to be abroad. Proportions overseas across different qualification levels converge to the New Zealand rate, for both industry trainees and tertiary graduates, as age increases.

Figure 3: Proportion out of New Zealand, by year left training



Source: Figures have been extracted from the IDI prototype managed by Statistics New Zealand.

¹¹ Tertiary graduate numbers in this report are based on those who completed a qualification in 2003, as they are from Papadopoulos (2012), rather than 2003 or 2004 as in this report.

¹² These estimates are based on the closest we can get in the IDI to the New Zealand-resident population for each age group in 2003. That is the number of people who received some form of taxable income (including both taxable earnings and benefits) over the 2004 tax year. This will not capture everyone in the New Zealand population. Figures from the Household Economic Survey for the year ended March 2004 suggest that around 9 per cent of people aged 17–59 did not receive the types of income measured in the IDI, with around two in three being female.

Migration is influenced by a number of factors, including the prevailing economic conditions in New Zealand and Australia, which means that our main findings may not hold in different economic climates. Figure 3 lets us compare the extent to which industry trainees from different years of completion go overseas. Each cohort over this period seems to have left at a slightly faster rate than previous cohorts. This seems to show some effect of changing economic conditions. Using the square markers, we can see the proportion overseas 2 years after completion edge up from 11.6 per cent for the 2003 cohort to 13.9 for the 2007 cohort. This falls back to 11.5 per cent for the 2009 cohort, which is likely due to the impact of the global financial crisis.

This indicator, the proportion out of New Zealand each year, summarises the results of two decisions that industry trainees make. First, whether they should leave New Zealand for an extended period, and second, for those who do decide to leave, whether they should return to New Zealand or not. The rest of this report will look at the decisions our population of 2003 and 2004 industry trainees had made by 2011.

3.2 Who left?

Using our measure of out of New Zealand for an extended period, we look at the proportion of 2003 and 2004 industry trainees who left New Zealand in the 7 years after training. The second column of Table 2 shows that just over one in six (17.2 per cent) of industry trainees spent at least one of these years abroad. This is higher than the rate for the New Zealand population in 2003 aged 17–59 years (11.0 per cent) but less than that for 2003 tertiary graduates (25.9 per cent) (Papadopoulos, 2012). Some, but not all, of these differences are explained by the different age profiles of these three populations. Table 4a adjusts¹³ these results to the age profile of industry trainees, which increases the New Zealand population rate to 13.3 per cent and reduces the tertiary graduate rate to 22.5 per cent.

Table 2 shows that, generally, the likelihood of leaving seems to be higher for those industry trainees who complete higher qualifications, for males and especially for younger age groups. The likelihood of leaving also increases with the student loan balance.

Trainees are able to access student loans as part of industry training but do not do so as regularly as provider-based students. It is not clear if trainees with student loan balances accrued them through industry training or through prior provider-based tertiary study, although it appears that the majority accrued them through the latter.¹⁴

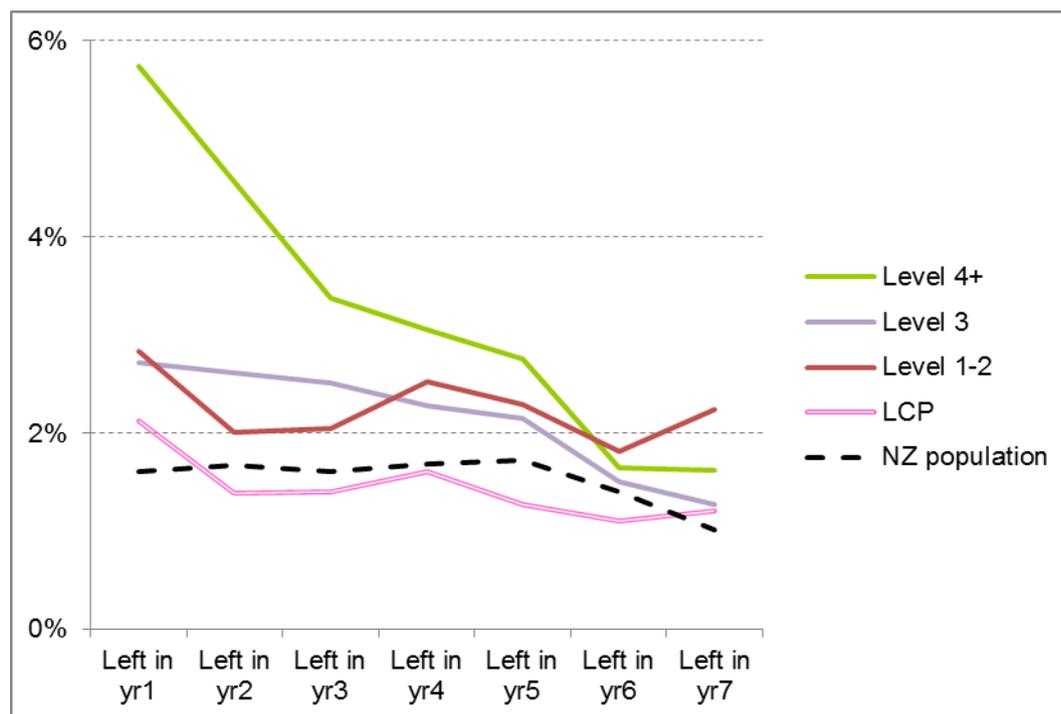
Modern Apprentices appear to be more likely to leave than industry trainees, but they are much younger on average. Given the strong age effect, it is important that we control for age differences when comparing the likelihood of leaving across groups. We will return to these variables in section 4, where we control for age and other effects.

¹³ Here, we have simply applied the share for each age band among industry trainees to the proportions that left for each age band for the New Zealand and tertiary graduate populations.

¹⁴ Of those in our industry trainee population who had a student loan balance on leaving study, approximately 80 per cent had a student loan balance prior to beginning industry training, although some may have added to their balances to help pay for industry training.

Figure 4 shows the proportion of industry trainees who left New Zealand in each of the years after they completed study. Those who completed LCPs and level 1–3 qualifications tended to leave at a similar rate each year. In doing so they were behaving like the overall New Zealand population. The rate of leaving gradually declined, especially so after year 5 post study, which to some extent reflects that our cohort is less likely to leave if they are older. In comparison, those who complete level 4 and higher qualifications were much more likely to leave in the first few years after completing their study. This is more like the behaviour of tertiary graduates with degree or higher qualifications.

Figure 4: Leaving rates over time, by qualification level



Source: Figures have been extracted from the IDI prototype managed by Statistics New Zealand.

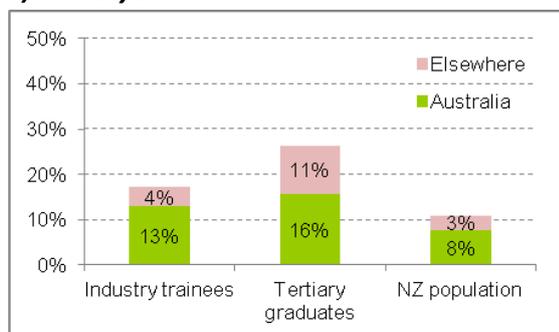
The IDI prototype does not yet contain information on the final destination for people who depart New Zealand; however, it does tell you where their plane lands in another country for the first time after leaving New Zealand. This is limiting, as for many PLT departures the final place of residence will be different to where the plane they left New Zealand in lands. In the absence of other information, we presume that the first landing overseas destination is the final destination. We therefore have aggregated this information into an ‘Australia’ or ‘Elsewhere’ variable for Figure 5.¹⁵ This shows that around 13 per cent of industry trainees left for Australia in the 7 years after completing their qualification. A further 4 per cent left for somewhere else. As overall leaving rates decrease for older age groups, the share of all departures that left for Australia increases. There is a similar pattern for tertiary graduates and the New Zealand population as a whole.

¹⁵ Papadopoulos (2012) suggests that this approach performs relatively well against official PLT statistics, although it is not possible to make a direct comparison. Around 70 per cent of the overall population aged 17–59 in 2003 – using the IDI population – who left New Zealand between 2004 and 2010 left for Australia. In comparison, when looking at PLT departures (across all ages) that were New Zealand citizens or born in New Zealand, the proportion going to Australia was around 65 per cent over the same period.

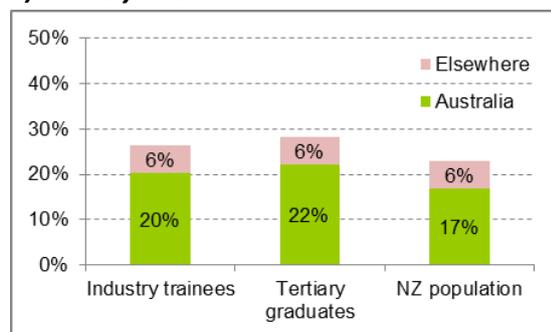
Figure 5 also shows that industry trainees tended to leave for Australia at a similar rate to tertiary graduates across all age groups. This was above the rate for New Zealanders as a whole. However, industry trainees tended to leave for other destinations at a similar rate to the overall New Zealand population, which was below the rate for tertiary graduates.

Figure 5: Proportion that leaves in the 7 years after training, by destination

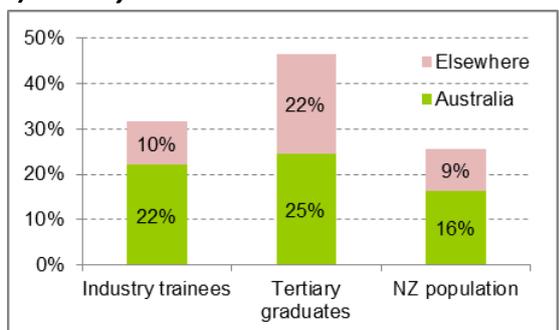
a) 17–59 years



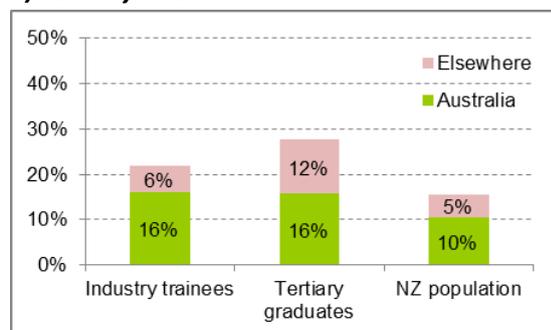
b) 17–20 years



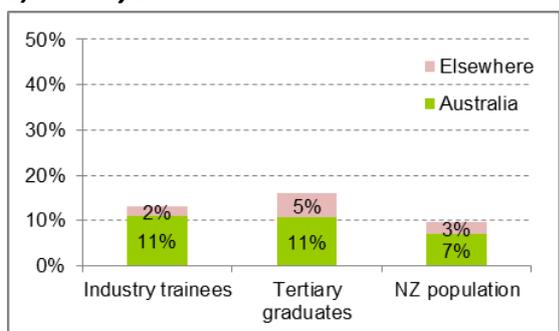
c) 20–24 years



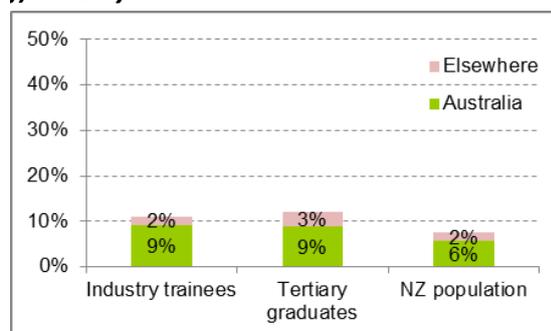
d) 25–29 years



e) 30–34 years



f) 35–39 years



Source: Figures have been extracted from the IDI prototype managed by Statistics New Zealand.

3.3 Who returned?

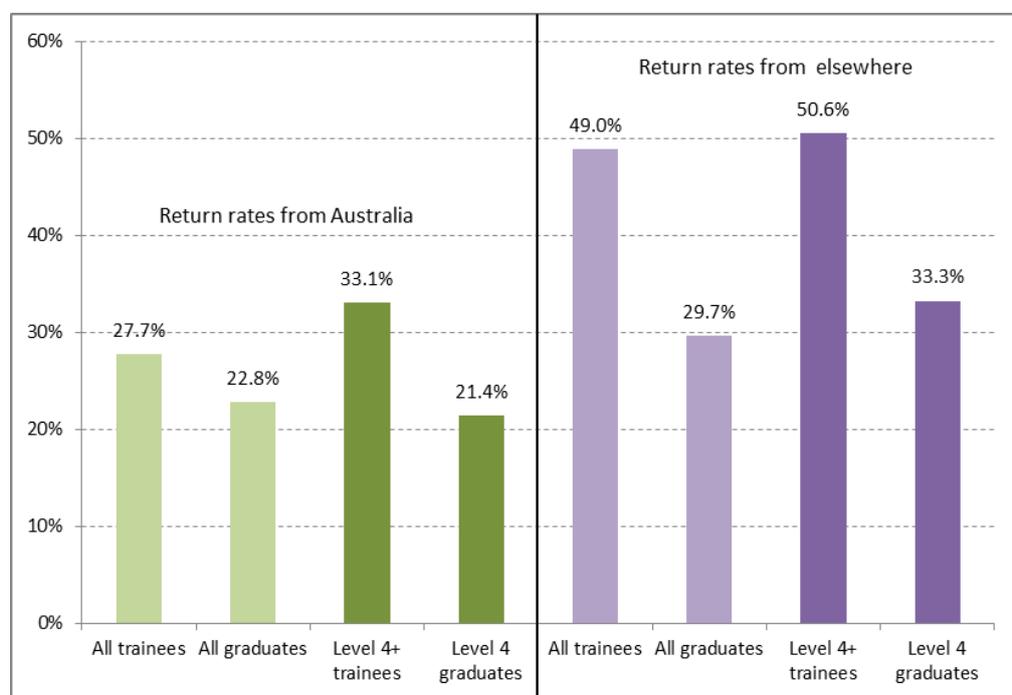
To make robust comparisons on rates of return to New Zealand, we need to compare groups for which we can observe the same time span for them to return. To do this, given our data, we look only at those industry trainees who departed New Zealand in the first 2 years after they completed training. We then look to see whether they were back in New Zealand 4 years after departure and were also still in New Zealand in the fifth year. The reason we look at industry trainees who were back in both years 4 and 5 is to get a better indication of those who are back permanently.

The third column of Table 2 shows that around a third of industry trainees (33.9 per cent) had returned to New Zealand using this measure. This is a higher rate of return than for tertiary graduates, of whom only one in four had returned after 4 years. It is also a slightly higher rate than for the New Zealand population, of whom around 30 per cent had returned. Table 4b shows that the different age profiles of these populations do not explain these differences.

Table 2 shows that, for industry trainees, the relationship between qualification level and return rates is not as straightforward as it was with the leaving rate. Younger and European trainees were more likely to return, as were those who completed level 4 qualifications.

Figure 6 shows the large impact that destination plays on the likelihood to return. Both industry trainees and tertiary graduates had lower return rates from Australia. Looking at return rates for those who completed level 4 qualifications¹⁶ shows that industry trainee return rates are around 50 per cent higher than those for tertiary graduates, from both Australia and elsewhere.

Figure 6: Graduate return rates by level, Australia versus elsewhere



Source: Figures have been extracted from the IDI prototype managed by Statistics New Zealand.

3.4 Who was still away?

We have discussed measures of leaving and returning, but what is probably of most interest is knowing the proportion of industry trainees who leave New Zealand permanently. Given that we can only see up to 7 years out for half of our study population, the closest we can get to this is looking at the proportion of trainees who were abroad in year 7 after completion and had been for at least the last 3 years (i.e. abroad in years 5–7).

¹⁶ Over 95 per cent of industry trainees who completed a qualification at level 4 or above actually completed at level 4 rather than at a higher level, so this is a valid comparison to make.

Table 2 shows that 9.1 per cent of trainees were out of New Zealand over this period. This is higher than the rate for the New Zealand population (6.1 per cent) but less than that for tertiary graduates (15.1 per cent). As with the proportion that leave New Zealand, some, but not all, of these differences are explained by the different age profiles of the three populations. Table 4a adjusts these results to the age profile of industry trainees, which increases the New Zealand population rate to 7.4 per cent and reduces the tertiary graduate rate to 13.3 per cent.

Table 2 shows that the proportion of industry trainees abroad 7 years after completion generally increases with qualification level and was higher for male, younger and non-European trainees.

Tables 3a and 3b summarise the key results (unadjusted for other differences) on who leaves, returns and is still away for both industry trainees and tertiary graduates. We have already seen that differing age profiles explain some of the differences between the two groups, and there are other differences between them that help explain much of the rest. Another key difference between the two is that, proportionally, many more tertiary graduates complete higher-level qualifications than industry trainees,¹⁷ and those who complete at higher levels are more likely to go overseas. A better comparison is to compare trainees and graduates at the same level. For those with level 4 qualifications, industry trainees left New Zealand at a higher rate than tertiary graduates. Even though they also returned to New Zealand at a higher rate, the net effect is that a higher proportion of industry trainees (11.6 per cent) at this level were abroad in years 5–7 after completion than tertiary graduates (9.8 per cent).

In addition, our industry training numbers are for trainees who completed qualifications in both 2003 and 2004, whereas the numbers for tertiary graduates covers only 2003. Restricting our industry training numbers to 2003 only slightly reduces the proportion abroad in years 5–7 to 11.4 per cent.

Finally, there are the demographic differences, such as age, between industry trainees and tertiary graduates at the same level.¹⁸ For example, whereas around 56 per cent of industry trainees who completed a level 4 qualification were under 30 years of age, only around 44 per cent of tertiary graduates were under this age.¹⁹ As we have seen, younger people are more likely to leave New Zealand. Table C shows that, if our level 4 industry trainees had the same age profile as their tertiary education counterparts, we estimate that the age-adjusted proportion abroad in years 5–7 would be around 9.5 per cent, which is very similar to the rate for level 4 tertiary graduates.²⁰

¹⁷ Industry training has limits on the proportion of trainees who can study at level 5 or above. Currently, the limit is 10 per cent.

¹⁸ Tables 3c and 3d report regression results for industry trainees and tertiary graduates that control for some of these differences. However, these regressions have been done separately, and the results are not directly comparable due to differences in the demographic profiles across qualifications. For example, level 4 industry trainees are younger on average than other trainees, whereas level 4 tertiary graduates are older than other graduates.

¹⁹ This is the reverse of when we look across all levels, where tertiary graduates have the younger age profile.

²⁰ Here, as previously, we have simply applied the share for each age band among tertiary graduates to the proportion abroad in years 5–7 for each age band for industry trainees.

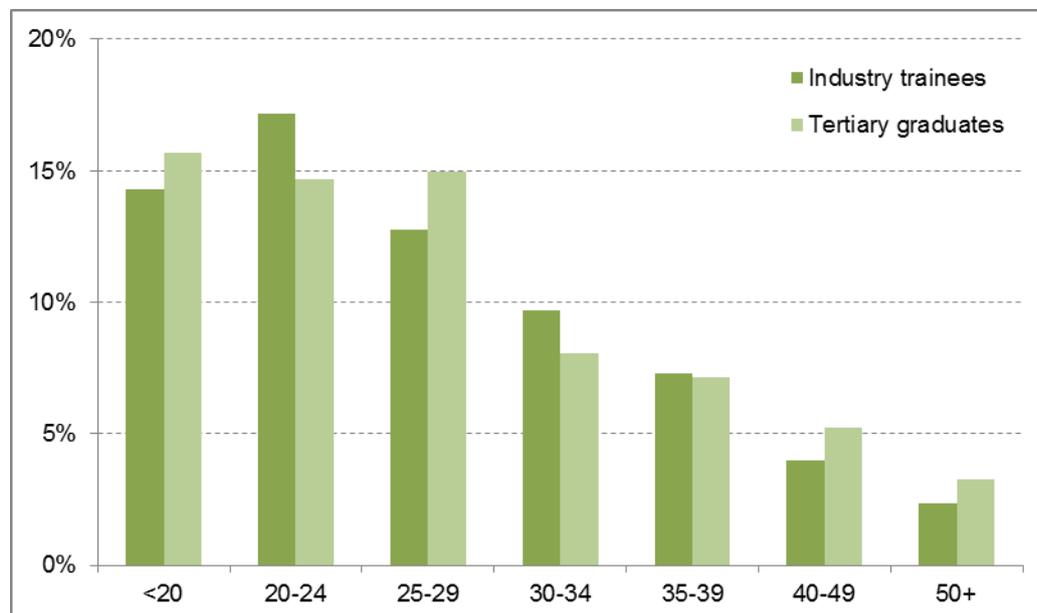
Table C: Age-adjusted proportion abroad in years 5–7 for industry trainees who completed a level 4 qualification in 2003

Age group	2003 industry trainees % abroad in yrs 5-7	Industry trainee share across age groups	Tertiary graduate share across age groups
<20	14.3	1.4	20.5
20-24	17.2	36.0	13.1
25-29	12.8	18.9	9.8
30-34	9.7	12.0	11.2
35-39	7.3	9.3	11.1
40-49	4.0	14.5	20.5
50+	2.4	8.1	13.7
All industry trainees - % abroad in yrs 5-7		11.4	
All industry trainees - % abroad in yrs 5-7 using tertiary age share			9.5

Source: Figures have been extracted from the IDI prototype managed by Statistics New Zealand.

Figure 7 is another way of showing how similar the proportions abroad in years 5–7 are, once we control for qualification level and age.

Figure 7: Proportion abroad in years 5–7, industry trainees and tertiary graduates who completed a level 4 qualification in 2003



Source: Figures have been extracted from the IDI prototype managed by Statistics New Zealand.

This analysis shows that, to be able to assess the impact of different characteristics on industry trainees’ migration patterns, we need to control for factors such as differing age profiles. In the next section, we control for the way different characteristics interact using regression modelling.

4. Regression analysis

In our regression analysis, we use logistic regression (as our variables of interest are binomial) and report average marginal effects and predicted probabilities calculated from the regression coefficients for ease of interpretation. Significance is shown using robust standard errors.

Regressions are run on our population of interest – trainees who completed a qualification. Our three dependent variables are:

- leaving – the proportion of all industry trainees who left New Zealand for a year or more in the 7 years after completing their qualification (Table 5)
- returning – the proportion of industry trainees who left New Zealand in the first 2 years after completing their qualification who were back in New Zealand in years 4 and 5 after leaving (Table 6)
- still away – the proportion of all industry trainees who were abroad in years 5–7 after completing their qualification (Table 7).

We present a number of regression models. For comparative purposes, the simplest regression, model 1, controls for the same set of variables that were available in the prior study of tertiary graduates – qualification level, sex, age group, ethnicity, student loan leaving balance and, for the returning measure, whether the destination²¹ was Australia or elsewhere.²²

In addition to these variables, model 2 makes use of the extra information that we have available to us on industry trainees – the region that they worked in,²³ their previous qualification, whether they were funded as part of the industry training or Modern Apprenticeship schemes, whether they were employees or self-employed during their training²⁴ and the industry they worked in.

Finally, model 3 adds variables about the trainee’s employer. These include the proportion of the employer’s employees who are in industry training and the employer’s size in terms of number of employees. This model also includes the mean monthly earnings a firm pays its employees and the earnings of the industry trainee as a proportion of this overall mean.

The diagnostics suggests that model 2 outperforms the other models,²⁵ and this is our preferred model and the source of our headline results – Table 8 presents the predicted probabilities for our three dependent variables using model 2. However, in general, estimates do not vary greatly between models.

²¹ As explained in section 3.2, this is based on where the plane they left New Zealand in lands.

²² We also control for the cohort year, as this paper looks at both 2003 and 2004 cohorts.

²³ There are issues with regional information in the IDI prototype. Information on where people live can sometimes be out of date. Information on the region of the employer can be difficult to determine where employers span multiple regions. To overcome this issue, we use region of the employer for trainees working at employers that operate in only one region and regions based on personal addresses for other trainees.

²⁴ Around 3 per cent of industry trainees appear to have been self-employed during their training.

²⁵ The diagnostics suggest that model 3 performs better for the returning measure. However, there is little difference between the estimates for models 2 and 3, and the additional variables in model 3 do not appear to explain the migration patterns of industry trainees.

Table 9 summarises results for field of study, using a variation of model 2 that excludes industry. Field of study was not included in model 2 because there is a large amount of overlap between it and industry. Note that, as per Papadopoulos (2012), we also present field of study regressions for each level of qualification separately, as what each field represents varies substantially across levels.

Our models do not explain much of the variation in migration patterns between industry trainees. This is because they do not include many of the variables that help explain people's migration decisions. These include factors such as comparisons of economic opportunities in New Zealand and abroad, the level of international risk (already seen in the impact of the global financial crisis), the influence of peers, the pull and push of personal relationships in New Zealand and abroad, and the extent to which some trainees can live in countries for extended periods due to where they or their parents were born.

Another limitation to our analysis is censoring – the data we had available at the time of our analysis meant we could only look at migration patterns up to 7 years after study. If we could see further in the future, we may see a different picture of how qualifications and other characteristics influence the likelihood of return. We therefore see our indicators on those who have left or were away at a particular time as being more robust than our indicators of return.

4.1 Trainee characteristics

There is good reason to believe that the characteristics of the trainee would be associated with the likelihood of them leaving New Zealand. Official statistics on migration show that younger New Zealanders are more likely to go overseas on a permanent or long-term basis. Papadopoulos (2012) also showed that variables such as sex, ethnicity and student loan balance were all also related to the likelihood of leaving New Zealand.

Sex

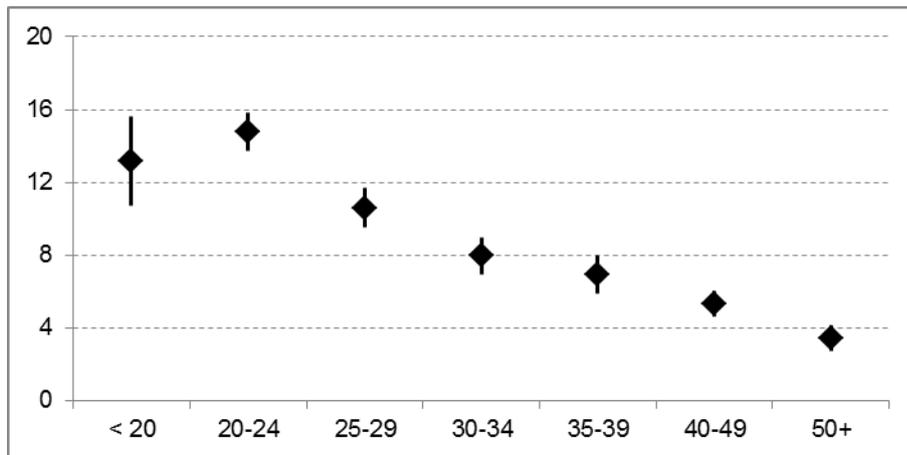
Table 5 shows that female trainees were significantly less likely to leave New Zealand and significantly more likely to return. The effect was relatively small, with around 9.6 per cent of males being abroad through years 5–7, compared to 8.1 per cent of females (Table 7). These patterns are very similar to those seen for tertiary graduates (Papadopoulos, 2012), although it is important to note that, while two-thirds of industry trainees were male, only 40 per cent of tertiary graduates were.

Age

Table 5 shows that the age of the trainee had a large and significant impact on the probability of them leaving New Zealand, as it had for tertiary graduates,²⁶ with the likelihood of leaving decreasing with age. Table 5 shows that younger trainees were also significantly more likely to return than older trainees – a pattern that is not observed with tertiary graduates, where return rates do not vary with age. Young industry trainees were still more likely to be abroad in years 5–7 than their older counterparts, as seen in Figure 8, which plots the predicted probabilities after controlling for other variables, along with 95 per cent confidence intervals.

²⁶ Tertiary graduates have a younger age profile, with around 55 per cent younger than 30, compared to around 45 per cent of industry trainees.

Figure 8: Proportion of industry trainees abroad in years 5–7, by age group (adjusted using model 2)



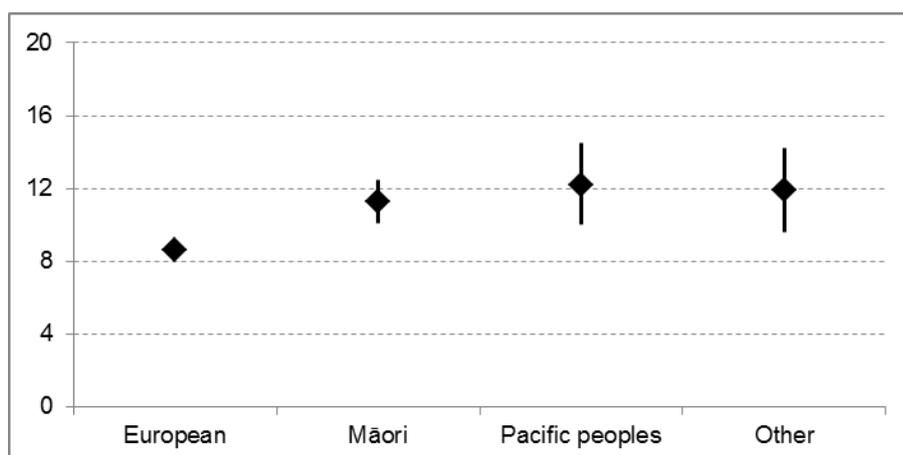
Source: Figures have been extracted from the IDI prototype managed by Statistics New Zealand. Note: Error bars show 95 per cent confidence interval for estimate.

Ethnicity

Table 5 shows that Māori, Pacific and trainees from other ethnic groups were all significantly more likely to leave New Zealand than European trainees. Māori and, especially, Pacific trainees also appear less likely to have returned to New Zealand. Figure 9 shows that the predicted proportion of European trainees abroad in years 5–7 is significantly less than the other ethnicities, although the differences are not large. Similar results were seen for tertiary graduates, who have a different ethnic profile, with only two-thirds being European as compared to three-quarters of industry trainees. It is likely that ethnicity is picking up other influences, such as the extent of overseas family connections and whether someone can legally live outside New Zealand and Australia for extended periods.²⁷ Hamer (2007) presents survey results on why a sample of Māori moved to and remained in Australia. Reasons given include joining whānau across the Tasman and the desire to escape negative experiences in New Zealand.

²⁷ Our analysis excludes those trainees who spent an extended period overseas using a non-New Zealand passport before study.

Figure 9: Proportion abroad in years 5–7, by ethnicity (adjusted using model 2)



Source: Figures have been extracted from the IDI prototype managed by Statistics New Zealand.

Student loan balance

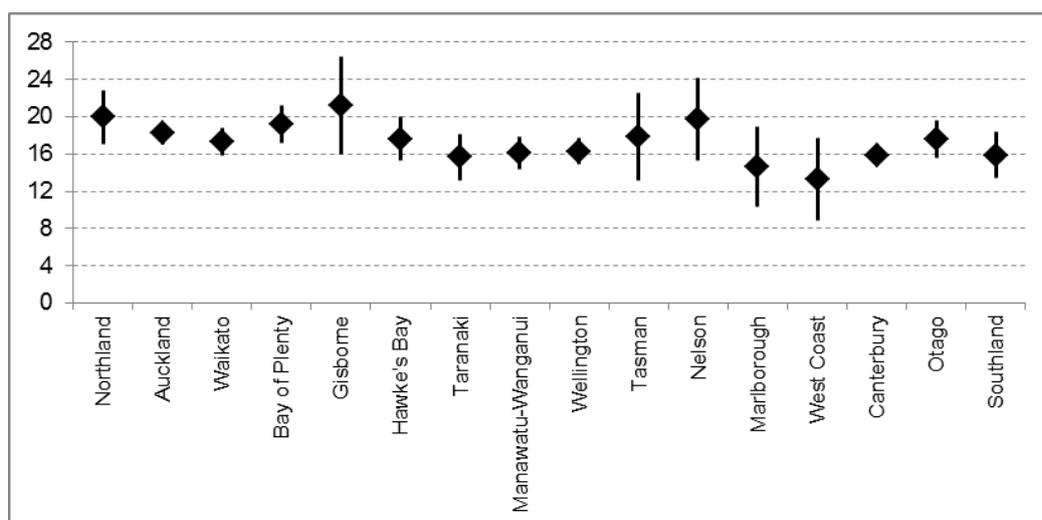
The student loan balance when leaving training is positively associated with the likelihood of leaving New Zealand (Table 5) and of being abroad in years 5–7 (Table 7). A similar result was found for tertiary graduates. Trainees are able to but do not access student loans as part of industry training as regularly as provider-based students. It is not clear if trainees with student loan balances accrued them through industry training or through prior provider-based tertiary study, although it appears that the majority accrued them through the latter. Only around one in seven industry trainees had a student loan balance when they left training, compared to one in two tertiary graduates.

Region

Figure 10 shows that some regions, such as Gisborne, Tasman, Nelson, Marlborough and West Coast, have insufficient numbers and wide standard errors and are therefore difficult to make accurate estimates for. Generally, where error rates are small enough for us to be confident, the big employment centres of Auckland, Wellington and Canterbury had lower leaving rates than other less-populated areas.

Differences in the relative strengths of regional labour markets as well as internal migration rates may explain this variation. This is an avenue for future research.

Figure 10: Proportion leaving, by region (adjusted using model 2)



Source: Figures have been extracted from the IDI prototype managed by Statistics New Zealand.

Destination

As discussed earlier, we did not have information on the final destination for people who leave New Zealand. Instead, we had aggregated information on where their plane landed first overseas and presumed this is their final destination. We have grouped destinations into Australia and everywhere else. This variable is the biggest factor in explaining the likelihood of returning to New Zealand for industry trainees. Table 6 shows that departing trainees whose plane landed in Australia were 16 percentage points less likely to return to New Zealand in years 4 and 5 after leaving than those whose plane landed elsewhere (29 per cent versus 45 per cent). A similar large effect was found for tertiary graduates. We would expect this type of difference given that it is easier for New Zealanders to maintain links with New Zealand and to stay for extended periods in Australia than in other countries.

4.2 Study characteristics

There were four main study characteristics variables: training fund (industry training or Modern Apprenticeships), NZQF level of programme, industry and field of study. We could expect that some types of skills are more likely to leave New Zealand as they could potentially earn more overseas. Papadopoulos (2012) showed that the likelihood that a tertiary graduate left New Zealand was strongly associated with the level of their qualification.

Training fund

Model 2 showed no difference in probability of leaving between years 1 and 7 if trainees were Modern Apprentices rather than industry trainees (Table 5). These findings should be taken with caution, however, because the Modern Apprenticeships programme was still in its infancy during the period covered by this data. The programme started in 2001, and apprentices who completed in 2003 and 2004 are likely to be higher than average achievers. They may also be atypical of current apprentices, as the programme has developed since this time, and industries offering apprenticeships have changed.

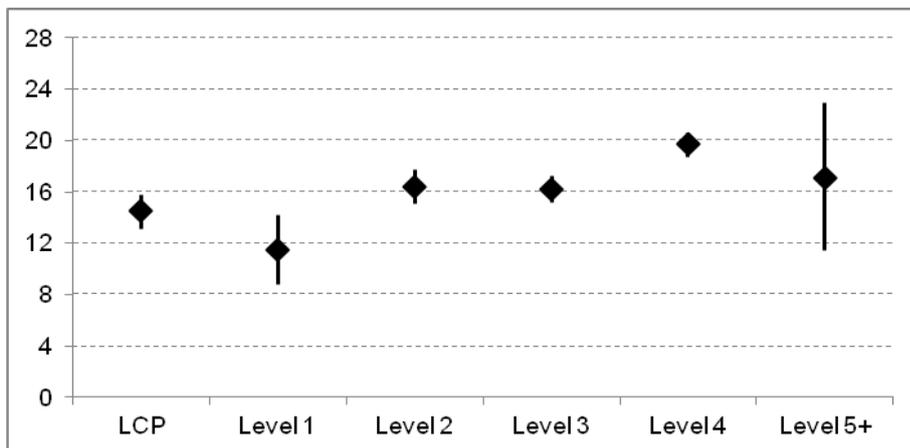
As discussed, Modern Apprentices are likely to be younger than general industry trainees and to study at higher NZQF levels, and there are likely to be previous qualification, industry and geographic concentration differences between them, but these variables are controlled for already elsewhere in the model.

Other remaining distinguishing differences between the funds may explain the significant difference between industry trainees and Modern Apprentices in respect to the second dependent variable, the probability of being back in New Zealand, for those who left, in years 4 and 5 after leaving. Modern Apprentices were significantly less likely than similar industry trainees to have returned to New Zealand by year 4 or 5, but there was no difference between them in respect to the third dependent variable, the probability of being abroad through years 5–7, implying that those who do go abroad return in the shorter to medium term at higher rates than comparable industry training completers. The reason for this is not clear, but we could speculate that a Modern Apprenticeship is a more career-oriented pathway for young people with less prior industry experience than industry training, which can more often occur when trainees have had some work experience. As such, motivations for working overseas long term may differ between the two types of completers.

Qualification level

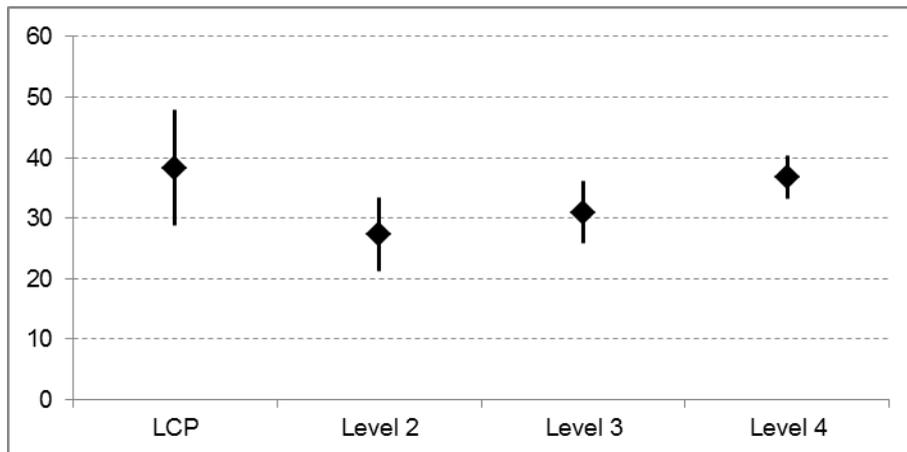
There was a clear difference between qualification level achieved in respect to going overseas, and the adjustment did not alter the observed results. Trainees completing higher-level (level 4) qualifications were more likely to leave compared to trainees completing qualifications at other levels or an LCP. However, these differences reduced when looking at the proportion still abroad in years 5–7. This is due to level 4 completers who left being more likely to be back in New Zealand in years 4 and 5 than level 2 or 3 completers.

Figure 11: Proportion leaving, by qualification level (adjusted using model 2)



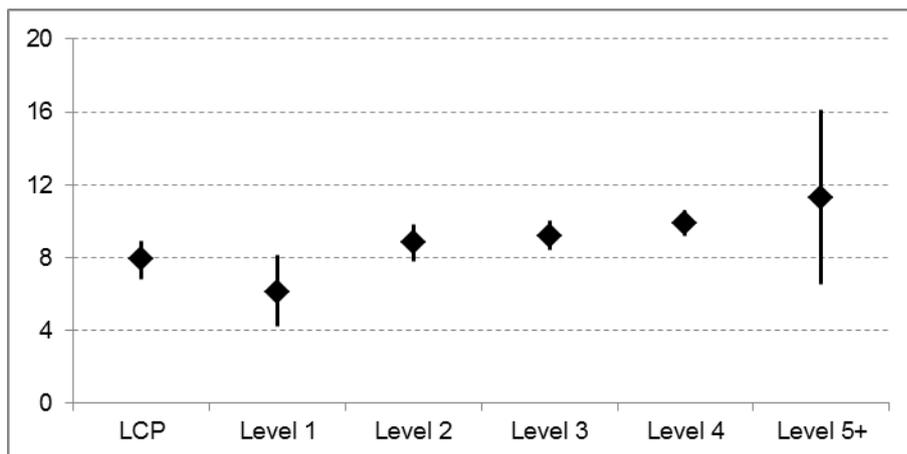
Source: Figures have been extracted from the IDI prototype managed by Statistics New Zealand.

Figure 12: Proportion back in New Zealand in years 4 and 5 after leaving (for those who left early), by qualification level (adjusted using model 2)



Source: Figures have been extracted from the IDI prototype managed by Statistics New Zealand.

Figure 13: Proportion abroad in years 5–7, by qualification level (adjusted using model 2)

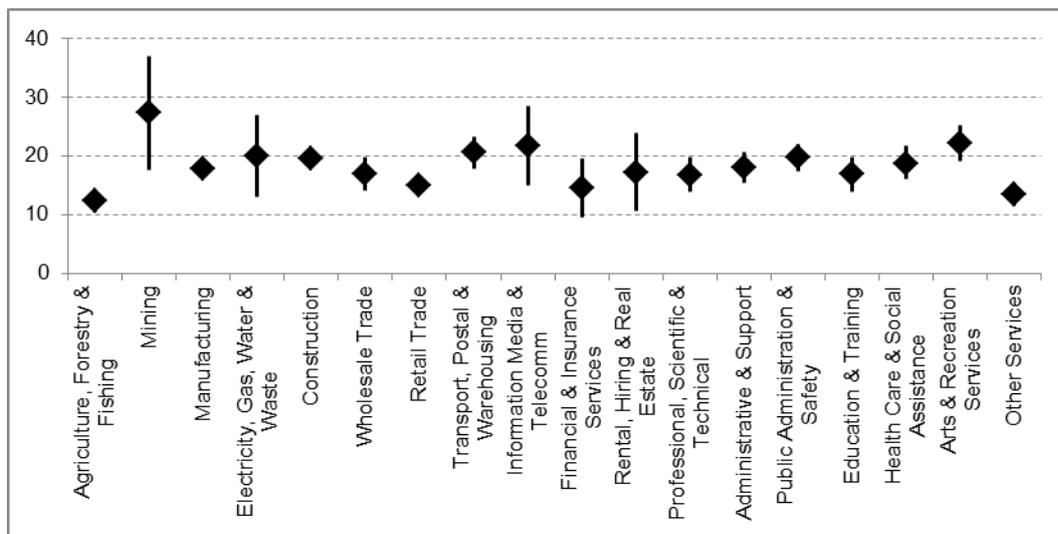


Source: Figures have been extracted from the IDI prototype managed by Statistics New Zealand.

Training industry

Any industry differences in labour movement and retention are likely to be a reflection of market conditions within New Zealand compared to those in other countries for each sector at the time covered by the data. There were a number of industries associated with higher probability of leaving than others. Trainees working in the mining; transport, postal and warehousing; and arts and recreation services industries (among others) were more likely to leave New Zealand than trainees working in other industries, such as agriculture, forestry and fishing; retail trade; and other services.

Figure 14: Proportion leaving, by industry (adjusted using model 2)

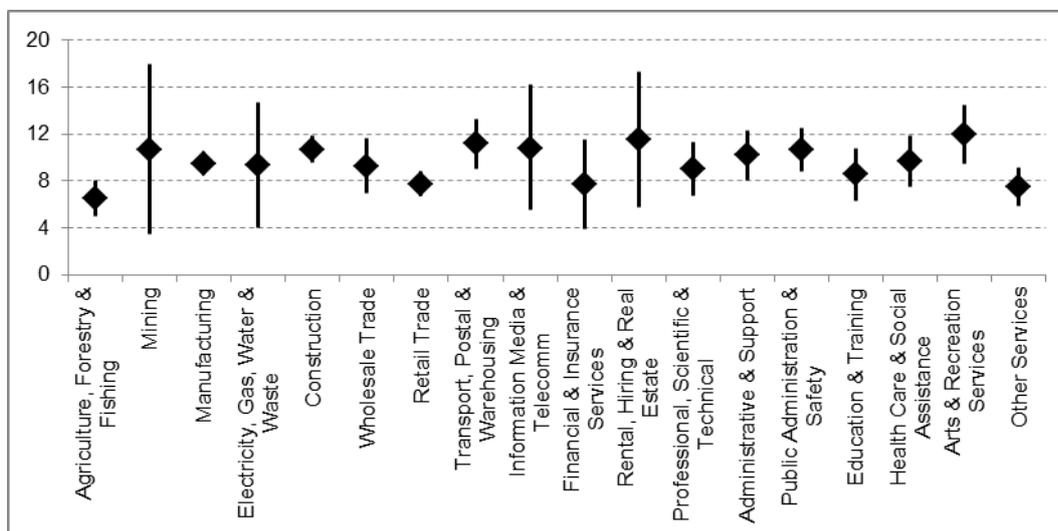


Source: Figures have been extracted from the IDI prototype managed by Statistics New Zealand.

No industry was statistically different to any other in probability of being back in New Zealand in years 4 and 5.

Figure 15 shows the predicted probabilities of being abroad through years 5–7. Some industries showed a greater proportion staying abroad long term than others, such as arts and recreation services; transport, postal and warehousing; and construction.

Figure 15: Proportion being abroad through years 5–7, by industry (adjusted using model 2)



Source: Figures have been extracted from the IDI prototype managed by Statistics New Zealand.

Field of study

Table 9 presents unadjusted and adjusted²⁸ results on the probability of being abroad through years 5–7, by field of study. In unadjusted terms, those who completed a qualification in engineering or building were more likely to be abroad (around 14–15 per cent) compared to other fields (around 6–8 per cent). However, once we control for other variables, these differences go away. Trainees in engineering and building are more likely to be younger and male, both characteristics associated with a higher probability of being abroad. Differences among fields of study for tertiary graduates were also reduced once other variables were controlled for.

4.3 Employment characteristics

Finally, we look at the impact of characteristics to do with the industry trainees' employment on their migration patterns. It could be that industry trainees who are more likely to leave their existing employment are also more likely to then leave New Zealand. In addition, differences in the earnings of the industry trainee could reflect differences in their skill levels, and more skilled industry trainees may be more likely to leave New Zealand.

The only employment related variable used in model 2 was the employee status indicator. This indicator has two possible values in the cohort selection data: employee or self-employed. Workers categorised as self-employed were less likely to leave New Zealand than employees (predicted probability of 13 per cent compared to 17.3 per cent), while self-employed workers were also less likely than employees to be abroad in years 5–7 (5.6 per cent compared to 9.2 per cent).

Model 3²⁹ also includes a number of other employment characteristics – the proportion of the employer's employees who are in industry training, the employer's size, the mean monthly earnings a firm pays and the earnings of the industry trainee as a proportion of this overall mean. These variables did not generally help explain migration patterns of industry trainees. Other regressions (not included in this paper) included the mean monthly earnings of the industry trainee (specified as a grouped categorical variable) instead of these other earnings variables, but it also did not help explain migration patterns. It may be that the earnings industry trainees receive during training – at the start of their careers – are not a good reflection of their skills.

²⁸ Field of study regressions for each level of qualification were run separately, using a version of model 2 that excludes industry to prevent issues with collinearity.

²⁹ Model 3 excluded a small number of trainees who were self-employed, as they were missing many of these employment characteristics.

5. Conclusions and future research

This report presents new statistics on the extent to which industry trainees leave New Zealand and return again. For New Zealand industry trainees who completed a qualification in either 2003 or 2004, it examines their migration patterns over the subsequent 7 years post-completion.

We are interested in better understanding the extent to which industry trainees leave New Zealand after completing their study and therefore do not contribute to New Zealand's human capital. There have been concerns that some types of industry trainees (for example, in building) are attracted to Australia. Knowing the extent to which this is happening can help better understand the availability of different types of skills (for example, for the Canterbury rebuild).

Around one in six industry trainees (17.2 per cent) left New Zealand in the 7 years after completing their qualification. This is lower than the leaving rate for tertiary graduates (25.9 per cent) but higher than the rate for the New Zealand population (11.0 per cent). Some, but not all, of these differences are explained by the different age profiles of these populations. If tertiary graduates had the same age profile as industry trainees, their leaving rate would be lower, at 22.5 per cent, while the rate for the New Zealand population would be higher, at 13.3 per cent.

Of those who left in the 2 years after completion, around a third (33.9 per cent) were back in New Zealand 4 years later. This is a higher rate of return than for tertiary graduates, of whom only one in four had returned after 4 years. It is also a slightly higher rate than for the New Zealand population, of whom around 30 per cent had returned. It could be that the skills and work experience obtained through industry training means that trainees can more quickly earn high wages in overseas labour markets.

Of all 2003 trainees, 9.1 per cent were abroad 7 years later and had been abroad for at least 3 years. This is less than the rate for tertiary graduates (15.1 per cent) but higher than the rate for the New Zealand population (6.1 per cent). If tertiary graduates had the same age profile as our industry training population, their rate abroad 7 years later would be lower, at 13.3 per cent, while the rate for the New Zealand population would be higher, at 7.4 per cent.

The likelihood of leaving New Zealand is associated with the level of the qualification, rising from around 10–11 per cent for those completing Limited Credit Programmes or level 1 qualifications to 23.4 per cent for those completing level 4 qualifications. The differences across levels in the proportions abroad in years 5–7 after study are less partly because, although trainees completing level 4 qualifications were more likely to leave, they were also more likely to return.

Table 3c adjusts these findings for observable differences between trainees in their personal and study characteristics. This tends to reduce the differences across levels in the likelihood of leaving New Zealand, returning again and (especially) being abroad 7 years later. Those who completed level 4 qualifications still left New Zealand, and returned again, at higher rates than those who completed lower-level qualifications.

In unadjusted terms, those who completed a level 4 qualification in engineering or building were more likely to be abroad (around 14–15 per cent) compared to other fields of study (around 6–8 per cent). This is mostly due to trainees in these fields being more likely to be young and male, and once

we control for this, these differences across fields go away. In terms of the study industry, trainees in transport, postal and warehousing; construction; and arts and recreation services were more likely to be abroad, after controlling for other variables.

There are a number of other characteristics that affect the migration patterns of industry trainees in a similar way to tertiary graduates, even after controlling for other differences. Being young, male or non-New Zealand European or having a leaving student loan balance are all associated with an increased likelihood of being abroad.

Our report follows the same methodology as Papadopoulos (2012) to determine if there are any differences between the two modes of learning (provider-based and workplace-based) in graduates and industry training completers leaving and returning to New Zealand. Industry trainees as a group are less likely to leave New Zealand than tertiary graduates, but this reflects important compositional differences that affect the likelihood to leave or return to New Zealand. Industry trainees are more likely to gain lower-level qualifications, be older, be New Zealand European and not have a student loan balance. These are all factors that are associated with lower probabilities of going overseas. On the other hand, industry trainees are more likely to be male and to depart to Australia, both factors associated with higher probabilities of being abroad for long periods. When we control for the two most important factors, qualification level and age, the proportions abroad are very similar. For example, 9.8 per cent of 2003 tertiary graduates who completed a level 4 qualification were abroad 7 years later and had been for at least 3 years. The equivalent rate for 2003 industry trainees who completed at the same level, standardised to the age profile of tertiary graduates, is 9.5 per cent.

Those who undertook Modern Apprenticeships were significantly less likely to be back in New Zealand 4 years after leaving, after controlling for other variables, than other industry trainees.

Industry trainees tended to leave for Australia at a similar rate to tertiary graduates but had a lower departure rate to other destinations. Those who moved to Australia were less likely to return than those who migrated elsewhere. We would expect this type of effect given that it is easier for New Zealanders to stay for extended periods in Australia than in other countries.

Industry trainees who completed LCPs and level 1–3 qualifications tended to leave at a similar rate each year. In doing so, they are behaving like the overall New Zealand population. In comparison, trainees who completed level 4 and higher qualifications were more likely to leave in the first few years after completing their study. This is more like the behaviour of tertiary graduates with degree or higher qualifications.

Migration is influenced by a number of factors, including the prevailing economic conditions in New Zealand and Australia, which means that our main findings may not hold in different economic climates. To look at this, we compared the migration patterns of different leaving cohorts of industry trainees. This seems to show some effect of changing economic conditions. The proportions overseas 2 years after completing their qualification increased from 11.6 per cent for the 2003 cohort to 13.9 per cent for the 2007 cohort. This fell back to 11.5 per cent for the 2009 cohort, which was probably due, to some extent, to the impact of the global financial crisis.

There are two key limitations to our analysis. The first is not being able to observe international movements beyond 7 years. Because of this, our indicators on those who have left are likely to be more robust than our indicators of return. Second, our analysis is also missing many variables that are likely to help explain people's migration decisions, including comparisons of economic opportunities in New Zealand and abroad, the level of international risk (for example, the impact of the global financial crisis), the influence of peers, the pull and push of personal relationships in New Zealand and abroad and the extent to which some graduates can live in countries for extended periods due to where they or their parents were born.

The approach used in this paper could be extended to look at the extent to which industry trainees stay with their employers or in their regions after training. It could also be used to look at the migration patterns of the wider New Zealand workforce. The recent integration of arrival and departure card data into the IDI will make it easier to compare the skills that are lost and gained through migration across the entire working-age population.

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Tables

Table 1: How different industry trainee populations compare

Students who left study in 2003 or 2004	Total	Matched to IDI	Matched to IDI %	Mean years abroad	Years abroad 75th percentile	Years abroad 90th percentile	Abroad in year 7 %	Abroad every year %	Never abroad %
All leavers	43,221	41,505	96.0%	0.8	0	4	14.3%	4.7%	81.1%
Excluding those not employed	42,105	40,386	95.9%	0.8	0	4	14.2%	4.5%	81.3%
Excluding those on non-NZ passports	40,056	38,361	95.8%	0.7	0	3	12.5%	3.1%	82.9%
Completed qualification?									
No	18,321	17,478	95.4%	0.7	0	3	13.1%	3.4%	83.0%
Yes	21,735	20,886	96.1%	0.7	0	3	12.0%	2.9%	82.8%
Completers only									
Highest level									
Limited Credit Programme	3,783	3,573	94.4%	0.4	0	1	8.1%	2.0%	89.3%
Level 1	684	642	93.9%	0.4	0	1	8.4%	2.3%	90.2%
Level 2	4,047	3,861	95.4%	0.6	0	3	12.6%	2.5%	83.4%
Lever 3	5,727	5,490	95.9%	0.6	0	3	11.4%	2.4%	84.8%
Level 4	7,224	7,065	97.8%	0.9	0	4	14.7%	4.0%	76.6%
Level 5+	273	258	94.5%	0.4	0	0	8.1%	S	90.7%
Sex									
Female	7,662	7,281	95.0%	0.5	0	2	10.0%	2.3%	86.3%
Male	14,076	13,605	96.7%	0.7	0	3	13.1%	3.2%	80.9%
Age group									
<20	1,011	963	95.3%	0.8	1	3	19.0%	1.9%	73.5%
20-24	5,085	4,968	97.7%	1.2	2	5	20.2%	4.9%	68.3%
25-29	3,216	3,111	96.7%	0.9	0	4	14.3%	4.5%	78.2%
30-34	2,808	2,730	97.2%	0.5	0	2	10.0%	2.5%	87.1%
35-39	2,373	2,268	95.6%	0.5	0	1	9.0%	2.4%	88.9%
40-49	4,329	4,116	95.1%	0.3	0	0	7.1%	1.2%	91.8%
50+	2,919	2,724	93.3%	0.2	0	0	4.1%	0.9%	95.2%
Ethnicity									
European	15,654	15,195	97.1%	0.7	0	3	11.4%	2.7%	82.8%
Māori	2,916	2,784	95.5%	0.7	0	3	13.9%	3.4%	82.4%
Pacific peoples	1,056	954	90.3%	0.7	0	3	14.5%	3.1%	82.7%
Other ethnic groups	951	864	90.9%	0.7	0	3	14.6%	4.2%	81.9%
Not stated	1,158	1,089	94.0%	0.6	0	2	11.6%	2.8%	84.6%

Source: Figures have been extracted from the IDI prototype managed by Statistics New Zealand. Note: All counts behind this table have been randomly rounded to base 3. 'S' indicates that data has been suppressed for quality or confidentiality reasons.

Table 2: Descriptive statistics for industry trainees (unadjusted)

Characteristic:	Count	% that left in years 1-7	Of those that left early, % back 4-5 years after leaving	% abroad in years 5-7
All industry trainee completers	20,886	17.2	33.9	9.1
Sex				
Male	13,605	19.1	34.0	10.2
Female	7,281	13.7	34.2	7.2
Age group				
< 20	963	26.5	40.0	11.8
20-24	4,971	31.7	38.5	15.7
25-29	3,111	21.9	38.6	11.3
30-34	2,730	13.0	25.0	7.8
35-39	2,271	11.1	18.8	6.8
40-49	4,119	8.2	13.9	5.0
50+	2,724	5.0	S	3.2
Ethnicity				
European	15,198	17.2	36.9	8.7
Māori	2,784	17.6	26.1	10.8
Pacific peoples	954	17.3	18.2	11.1
Other	864	18.1	28.6	10.9
Not stated	1,089	15.4	26.3	7.8
Regional council				
Northland	708	19.9	36.8	10.6
Auckland	4,371	19.0	30.7	10.2
Waikato	2,232	17.9	43.6	8.6
Bay of Plenty	1,371	19.5	25.7	11.6
Gisborne	231	19.5	S	10.4
Hawke's Bay	993	16.6	25.0	10.3
Taranaki	900	13.3	33.3	7.0
Manawatu-Wanganui	1,590	15.5	37.5	7.9
Wellington	2,304	17.4	30.4	9.8
Tasman	294	15.3	S	8.2
Nelson	306	18.6	S	10.8
Marlborough	255	14.1	S	5.9
West Coast	195	13.8	S	9.2
Canterbury	3,195	15.6	38.4	7.8
Otago	1,137	18.2	41.9	8.7
Southland	777	14.3	S	7.3
Student loan balance				
\$0.00	17,877	15.6	33.6	8.3
\$0.01-\$10,000	1,866	25.1	33.3	13.9
\$10,000-\$20,000	657	27.4	39.1	13.2
\$20,000+	486	31.5	40.0	15.8
Destination				
Australia	1,092		27.7	
Elsewhere	435		49.0	
Qualification level				
LCP	3,573	10.7	32.6	6.0
Level 1	642	10.3	S	6.1
Level 2	3,861	16.6	27.3	8.7
Level 3	5,490	15.2	27.3	8.9
Level 4	7,065	23.4	39.4	11.6
Level 5+	258	9.3	S	7.0
Previous qualification				
No Previous Qualifications	2,934	14.7	28.8	7.9
5th Form (or at least 12 credits at level 1)	2,574	17.6	31.3	9.1
6th Form (or at least 12 credits at level 2)	2,133	20.0	39.7	9.8
7th Form (or at least 12 credits at level 3)	978	22.1	38.5	12.3
Sub Degree	3,162	14.8	44.9	7.2
Degree	705	19.1	35.0	9.8
Not specified	8,400	17.4	29.0	9.7

Characteristic:	Count	% that left in years 1-7	Of those that left early, % back 4-5 years after leaving	% abroad in years 5-7
Year left training				
2003	9,102	16.7	36.9	8.8
2004	11,784	17.5	30.9	9.4
Funding arrangement				
ITF	20,196	16.6	34.3	8.8
MA	687	34.5	29.3	18.3
Employment status				
Employee	20,265	17.5	S	9.3
Self-employed	621	9.2	S	4.2
Industry				
Agriculture, forestry & fishing	1,029	13.4	31.6	7.0
Mining	87	20.7	S	10.3
Manufacturing	4,143	16.4	30.8	9.0
Electricity, gas, water & waste	126	16.7	S	7.1
Construction	2,661	25.4	39.1	13.3
Wholesale trade	615	16.1	S	8.8
Retail trade	2,466	15.7	30.0	8.2
Accommodation & food	1,857	S	S	S
Transport, postal & warehousing	1,125	13.9	S	8.3
Information media & telecommunications	144	18.8	S	10.4
Financial & insurance	195	12.3	S	6.2
Rental, hiring & real estate	132	13.6	S	9.1
Professional, scientific & technical	627	15.3	S	8.1
Administrative & support	897	15.4	21.1	9.0
Public administration & safety	1,293	16.0	31.0	8.6
Education & training	495	21.8	S	10.9
Health care & social assistance	1,554	8.9	S	5.0
Arts & recreation	627	23.9	38.1	12.0
Other services	777	20.8	43.5	10.4
Proportion in industry training				
< 5%	4,335	16.7	33.7	9.1
5-10%	3,378	16.5	35.4	8.8
10-20%	4,449	17.5	33.9	9.3
20-40	4,152	18.3	30.6	10.0
40% +	3,951	18.3	36.1	9.3
Not stated	627	9.1	S	4.3
Size of enterprise				
< 10	2,805	21.8	40.4	10.5
10-50	4,128	19.4	31.1	10.6
50-250	3,702	18.2	34.0	9.9
250-1000	4,131	14.8	33.0	8.2
1000+	5,493	15.2	30.7	8.2
Not stated	627	9.1	S	4.3
Earnings as proportion of enterprise mean				
< 75%	4,023	20.4	34.0	10.1
75%-100%	5,238	18.9	35.5	9.6
100%-125%	4,764	16.9	35.0	9.4
Over 125%	6,237	14.7	29.8	8.3
Not stated	627	9.1	S	4.3
Enterprise mean monthly earnings				
< \$1,750	5,679	16.3	33.3	8.3
\$1,750-\$2,750	4,581	19.3	34.6	10.5
\$2,750-\$3,750	5,355	17.5	31.7	9.5
More than \$3,750	4,641	17.0	35.1	9.0
Not stated	627	9.1	S	4.3

Source: Figures have been extracted from the IDI prototype managed by Statistics New Zealand. Note: All counts behind this table have been randomly rounded to base 3. 'S' indicates that data has been suppressed for quality or confidentiality reasons.

Table 3: Summary of main results, by qualification

a) Industry trainees, unadjusted

Level of qualification	Number of industry trainees	% that left NZ yrs 1–7	Of those that left early, % back in NZ in yrs 4-5	% abroad in yrs 5-7
LCP	3,573	10.7	32.6	6.0
Level 1	642	10.3	...	6.1
Level 2	3,861	16.6	27.3	8.7
Level 3	5,490	15.2	27.3	8.9
Level 4	7,065	23.4	39.4	11.6
Level 5+	258	9.3	...	7.0
All trainees	20,886	17.2	33.9	9.1

c) Industry trainees, controlling for some covariates (model 1)

Level of qualification	Number of industry trainees	% that left NZ yrs 1–7	Of those that left early, % back in NZ in yrs 4-5	% abroad in yrs 5-7
LCP	3,573	14.6	36.3	7.9
Level 1	642	11.7	...	6.3
Level 2	3,861	15.1	27.4	8.1
Level 3	5,490	16.8	30.4	9.5
Level 4	7,065	19.8	37.2	10.0
Level 5+	258	16.7	...	11.3
All trainees	20,886	17.2	33.9	9.1

e) Industry trainees, controlling for all covariates (model 2)

Level of qualification	Number of industry trainees	% that left NZ yrs 1–7	Of those that left early, % back in NZ in yrs 4-5	% abroad in yrs 5-7
LCP	3,573	14.5	38.3	7.9
Level 1	642	11.5	...	6.1
Level 2	3,861	16.4	27.3	8.8
Level 3	5,490	16.2	30.9	9.2
Level 4	7,065	19.7	36.8	9.9
Level 5+	258	17.1	...	11.3
All trainees	20,886	17.2	33.9	9.1

b) Tertiary graduates, unadjusted

Level of qualification	Number of tertiary graduates	% that left NZ yrs 1–7	Of those that left early, % back in NZ in yrs 4-5	% abroad in yrs 5-7
Level 1–3 certificates	14,010	14.2	24.2	8.2
Level 4 certificates	5,316	16.9	24.7	9.8
Level 5–7 diplomas	4,755	23.8	33.6	12.6
Level 7 bachelors/grad	11,673	39.2	25.8	22.7
Level 8 honours/postgrad	3,048	41.4	24.0	25.9
Level 9 masters	1,467	34.2	19.5	22.1
Level 10 doctorate	354	42.4	17.2	30.5
All graduates	40,623	25.9	25.6	15.1

d) Tertiary graduates, controlling for some covariates (model 1)

Level of qualification	Number of tertiary graduates	% that left NZ yrs 1–7	Of those that left early, % back in NZ in yrs 4-5	% abroad in yrs 5-7
Level 1–3 certificates	14,010	18.7	23.6	10.6
Level 4 certificates	5,316	22.0	24.3	12.6
Level 5–7 diplomas	4,755	23.4	31.8	12.5
Level 7 bachelors/grad	11,673	30.7	26.5	17.6
Level 8 honours/postgrad	3,048	35.3	22.7	21.9
Level 9 masters	1,467	34.3	22.3	21.3
Level 10 doctorate	354	48.1	16.7	34.9
All graduates	40,623	25.9	25.6	15.1

Source: Figures have been extracted from the IDI prototype managed by Statistics New Zealand. Note: All counts behind this table have been randomly rounded to base 3. ‘...’ indicates that this cell was not estimable due to its small size or was suppressed for quality or confidentiality reasons.

Table 4: Age-adjusted main results for 2003 tertiary graduate and New Zealand populations

a) Age-adjusted results for the leaving and still away indicators

Age group	Industry trainee share across age groups	2003 NZ population % that left NZ yrs 1-7	2003 tertiary graduate % that left NZ yrs 1-7	2003 NZ population % abroad in yrs 5-7	2003 tertiary graduate % abroad in yrs 5-7
<20	4.6	22.8	28.2	10.5	14.2
20-24	23.8	25.7	46.5	13.6	26.7
25-29	14.9	15.6	27.6	8.9	16.9
30-34	13.1	9.7	16.0	6.0	10.2
35-39	10.9	7.5	12.1	4.7	8.3
40-49	19.7	6.0	8.7	3.6	5.5
50+	13.0	4.3	6.6	2.4	3.7
Total - using original age share		11.0	25.9	6.1	15.1
Total - using industry training age share		13.3	22.5	7.4	13.3

b) Age-adjusted results for the returning and still away indicators

Age group	Industry trainee leavers share across age groups	Of 2003 NZ population that left early, % back in NZ in yrs 4-5	Of 2003 tertiary graduates that left early, % back in NZ in yrs 4-5
<20	7.1	31.7	27.9
20-24	43.9	33.7	25.9
25-29	19.0	32.0	24.5
30-34	9.9	23.3	26.1
35-39	7.0	20.0	23.2
40-49	9.4	21.1	21.9
50+	3.8	28.3	33.3
Total - using original age share		28.8	25.6
Total - using industry training age share		29.8	25.5

Source: Figures have been extracted from the IDI prototype managed by Statistics New Zealand. Note: All counts behind this table have been randomly rounded to base 3. The total rates using original age shares for the New Zealand population are calculated on those aged 17-59. This is done to better match the industry training and tertiary graduate populations.

Table 5: Marginal effects from logistic regressions modelling the probability of leaving between years 1 and 7

Characteristic	Model 1: Some covariates			Model 2: Most covariates			Model 3: All covariates		
	ME	Sig	SE	ME	Sig	SE	ME	Sig	SE
Sex (reference: Male)									
Female	-2.6 ***		0.6	-2.0 ***		0.6	-2.0 ***		0.7
Age group (reference: 20-24 years)									
< 20	-1.0		1.7	-0.4		1.8	-0.1		1.9
25-29	-9.2 ***		1.0	-9.3 ***		1.0	-9.9 ***		1.0
30-34	-16.5 ***		0.9	-16.6 ***		1.0	-16.8 ***		1.0
35-39	-18.1 ***		1.0	-18.4 ***		1.0	-18.7 ***		1.0
40-49	-20.8 ***		0.8	-21.1 ***		0.9	-21.5 ***		0.9
50+	-24.1 ***		0.8	-24.6 ***		0.9	-24.8 ***		0.9
Ethnicity (reference: European)									
Māori	2.5 ***		0.8	2.1 **		0.8	2.0 **		0.8
Pacific peoples	3.3 **		1.4	2.7 *		1.4	2.6 *		1.4
Other	3.6 **		1.4	3.3 **		1.4	3.4 **		1.5
Not stated	-1.1		1.1	-0.9		1.2	-0.7		1.2
Regional council (reference: Northland)									
Auckland				-1.8		1.6	-1.8		1.6
Waikato				-2.6		1.6	-2.0		1.7
Bay of Plenty				-0.8		1.8	-0.3		1.8
Gisborne				1.2		3.0	1.6		3.1
Haw ke's Bay				-2.3		1.9	-1.9		1.9
Taranaki				-4.3 **		1.9	-3.9 **		2.0
Manaw atu-Wanganui				-3.9 **		1.7	-3.5 **		1.7
Wellington				-3.7 **		1.6	-3.1 *		1.7
Tasman				-2.1		2.8	-1.9		2.8
Nelson				-0.2		2.7	0.0		2.7
Marlborough				-5.4 **		2.6	-5.4 **		2.7
West Coast				-6.7 **		2.7	-6.2 **		2.7
Canterbury				-4.1 ***		1.6	-3.9 **		1.6
Otago				-2.4		1.8	-2.2		1.8
Southland				-4.1 **		1.9	-3.7 *		2.0
Student loan balance (reference: \$0.00)									
\$0.01-\$10,000	2.0 **		0.8	2.5 ***		0.9	2.3 ***		0.9
\$10,000-\$20,000	4.1 ***		1.4	4.4 ***		1.4	4.4 ***		1.4
\$20,000+	8.3 ***		1.7	8.3 ***		1.8	7.8 ***		1.8
Qualification level (reference: LCP)									
Level 1	-3.0 *		1.5	-3.0 *		1.5	-3.2 **		1.6
Level 2	0.5		0.9	1.9 **		0.9	2.4 **		1.0
Level 3	2.2 ***		0.8	1.7 **		0.9	1.8 **		0.9
Level 4	5.2 ***		0.8	5.2 ***		0.9	5.3 ***		0.9
Level 5+	2.1		3.0	2.7		3.0	2.1		3.1
Previous qualification (reference: No previous qualification)									
5th Form (or at least 12 credits at level 1)				0.5		1.0	0.7		1.0
6th Form (or at least 12 credits at level 2)				-0.2		1.0	0.0		1.0
7th Form (or at least 12 credits at level 3)				-0.1		1.3	0.2		1.3
Sub Degree				-2.2 **		1.0	-2.2 **		1.0
Degree				3.5 **		1.7	3.5 **		1.7
Not specified				1.0		0.8	1.1		0.9

Characteristic	Model 1: Some covariates			Model 2: Most covariates			Model 3: All covariates		
	ME	Sig	SE	ME	Sig	SE	ME	Sig	SE
Year left training (reference: 2003)									
2004	0.5		0.5	0.7		0.5	0.8		0.5
Funding arrangement (reference: ITF)									
MA				1.5		1.3	1.6		1.3
Employment status (reference: Employee)									
Self-employed				-4.2 ***		1.6			
Industry (reference: Agriculture, forestry and fishing)									
Mining				15.0 ***		5.1	13.5 ***		5.1
Manufacturing				5.4 ***		1.2	4.0 ***		1.3
Electricity, gas, water & waste				7.6 **		3.7	6.1		3.7
Construction				7.1 ***		1.2	6.2 ***		1.3
Wholesale trade				4.6 ***		1.8	3.2 *		1.9
Retail trade				2.6 **		1.2	1.8		1.4
Accommodation & food				...		...	...		...
Transport, postal & warehousing				8.2 ***		1.7	6.6 ***		1.8
Information media & telecommunications				9.3 ***		3.6	7.6 **		3.6
Financial & insurance				2.1		2.8	0.1		2.8
Rental, hiring & real estate				4.9		3.6	4.8		3.8
Professional, scientific & technical				4.4 **		1.8	4.0 **		1.9
Administrative & support				5.7 ***		1.7	4.9 ***		1.8
Public administration & safety				7.4 ***		1.5	6.7 ***		1.7
Education & training				4.5 **		1.8	4.8 **		2.0
Health care & social assistance				6.4 ***		1.8	5.8 ***		1.9
Arts & recreation				9.7 ***		1.8	9.8 ***		2.0
Other services				1.1		1.4	0.9		1.5
Proportion in industry training (reference: < 5%)									
5-10%							-0.8		0.9
10-20%							-1.0		0.9
20-40							-1.0		0.9
40% +							-1.6 *		1.0
Size of enterprise (reference: < 10 employees)									
10-50							1.4		0.9
50-250							2.8 ***		1.1
250-1000							-0.3		1.1
1000+							0.6		1.1
Earnings as proportion of enterprise mean (reference: < 75%)									
75%-100%							0.2		0.8
100%-125%							0.6		0.8
Over 125%							0.1		0.9
Enterprise mean monthly earnings (reference: < \$1,750)									
\$1,750-\$2,750							1.1		0.9
\$2,750-\$3,750							1.1		1.0
More than \$3,750							2.2 *		1.2
Diagnostics									
Number of obs	20,886			20,860			20,251		
Pseudo-R2	0.0850			0.0926			0.0917		
Model prediction correct >= 0.5	82.8%			82.8%			82.5%		
Area under ROC curve	0.7075			0.7166			0.7154		

Source: Figures have been extracted from the IDI prototype managed by Statistics New Zealand. Note: Marginal effects (ME) and standard errors (SE) have been multiplied by 100 to represent the percentage point estimate (and associated error) of the effect of switching from the omitted reference group. *** means statistically significant at the 1 per cent level, ** significant at the 5 per cent level, * significant at the 10 per cent level. '...' indicates that this cell was not estimable due to its small size or was suppressed for quality or confidentiality reasons.

Table 6: Marginal effects from logistic regressions modelling the probability of being back in New Zealand in years 4 and 5 after leaving (for those left early)

Characteristic	Model 1: Some covariates			Model 2: Most covariates			Model 3: All covariates		
	ME	Sig	SE	ME	Sig	SE	ME	Sig	SE
Sex (reference: Male)									
Female	5.4	*	3.1	6.4	*	3.5	6.3	*	3.6
Age group (reference: 20-24 years)									
< 20	4.9		6.7	8.8		6.9	10.2		7.1
25-29	0.5		3.2	0.4		3.2	0.8		3.3
30-34	-8.1	*	4.4	-8.9	**	4.4	-8.7	**	4.5
35-39	-14.0	***	5.0	-13.0	***	5.0	-12.3	**	5.2
40-49	-20.5	***	4.2	-20.1	***	4.2	-21.3	***	4.2
50+	...		...	...		...	...		...
Ethnicity (reference: European)									
Māori	-6.1	*	3.6	-4.9		3.6	-5.4		3.7
Pacific peoples	-12.7	**	5.8	-10.2	*	6.0	-8.4		6.2
Other	-1.9		6.1	0.9		6.4	0.4		6.6
Not stated	-5.4		6.1	-3.9		6.3	-2.6		6.5
Regional council (reference: Northland)									
Auckland				-5.5		6.8	-6.2		6.7
Waikato				1.5		7.3	1.1		7.2
Bay of Plenty				-6.4		7.5	-7.1		7.4
Gisborne				...		...	...		...
Haw ke's Bay				-7.4		8.1	-7.9		8.0
Taranaki				-1.0		9.2	0.6		9.2
Manaw atu-Wanganui				2.7		7.7	3.1		7.6
Wellington				-7.6		7.2	-7.9		7.1
Tasman				...		...	...		...
Nelson				...		...	...		...
Marlborough				...		...	...		...
West Coast				...		...	...		...
Canterbury				-0.3		7.1	-0.1		6.9
Otago				2.3		8.0	2.0		7.9
Southland				...		...	...		...
Student loan balance (reference: \$0.00)									
\$0.01-\$10,000	-2.8		3.4	-4.4		3.4	-4.5		3.5
\$10,000-\$20,000	1.7		5.6	-0.9		6.0	-0.2		6.0
\$20,000+	-1.2		6.3	-2.9		6.6	-1.4		7.0
Destination (reference: Elsewhere)									
Australia	-16.9	***	2.8	-16.4	***	2.8	-16.6	***	2.8
Qualification level (reference: LCP)									
Level 1	...		...	...		...	...		...
Level 2	-9.0	*	5.2	-11.0	**	5.6	-12.3	**	5.8
Level 3	-6.0		5.0	-7.4		5.5	-7.7		5.6
Level 4	0.9		4.9	-1.6		5.5	-2.2		5.6
Level 5+	...		...	...		...	...		...
Previous qualification (reference: No previous qualification)									
5th Form (or at least 12 credits at level 1)				1.0		4.8	1.4		4.9
6th Form (or at least 12 credits at level 2)				6.1		4.9	6.1		5.1
7th Form (or at least 12 credits at level 3)				6.2		6.5	6.0		6.4
Sub Degree				14.1	***	5.0	14.1	***	5.1
Degree				7.1		7.7	7.4		7.4
Not specified				-1.0		4.0	-1.2		4.1

Characteristic	Model 1: Some covariates			Model 2: Most covariates			Model 3: All covariates		
	ME	Sig	SE	ME	Sig	SE	ME	Sig	SE
Year left training (reference: 2003)									
2004	-5.8	**	2.3	-5.7	**	2.4	-5.4	**	2.4
Funding arrangement (reference: ITF)									
MA				-9.4	**	4.0	-9.4	**	4.0
Employment status (reference: Employee)									
Self-employed				...		...
Industry (reference: Agriculture, forestry and fishing)									
Mining				...		...	...		..
Manufacturing				0.6		6.8	-1.6		7.2
Electricity, gas, water & waste				...		...	...		...
Construction				3.2		6.7	0.6		7.0
Wholesale trade				...		...	...		...
Retail trade				-0.7		7.3	-2.2		7.9
Accommodation & food				...		...	...		...
Transport, postal & warehousing				...		...	...		...
Information media & telecommunications				...		...	...		...
Financial & insurance				...		...	...		...
Rental, hiring & real estate				...		...	...		...
Professional, scientific & technical				...		...	...		...
Administrative & support				-11.1		8.5	-12.8		9.0
Public administration & safety				-1.6		8.2	-3.8		9.1
Education & training				...		...	...		...
Health care & social assistance				...		...	...		...
Arts & recreation				-3.7		8.3	-3.4		9.0
Other services				3.2		8.4	1.4		8.5
Proportion in industry training (reference: < 5%)									
5-10%							5.2		4.4
10-20%							3.3		4.2
20-40							-2.4		4.3
40% +							-1.9		4.6
Size of enterprise (reference: < 10 employees)									
10-50							-7.7	*	4.2
50-250							-4.4		4.8
250-1000							-4.7		5.3
1000+							-4.0		5.4
Earnings as proportion of enterprise mean (reference: < 75%)									
75%-100%							2.6		3.5
100%-125%							5.7		3.9
Over 125%							1.8		4.3
Enterprise mean monthly earnings (reference: < \$1,750)									
\$1,750-\$2,750							-2.0		4.1
\$2,750-\$3,750							0.6		4.9
More than \$3,750							2.3		5.5
Diagnostics									
Number of obs	1,526			1,526			1,504		
Pseudo-R2	0.0663			0.0986			0.1019		
Model prediction correct >= 0.5	67.8%			69.5%			69.6%		
Area under ROC curve	0.6730			0.7062			0.7108		

Source: Figures have been extracted from the IDI prototype managed by Statistics New Zealand. Note: Marginal effects (ME) and standard errors (SE) have been multiplied by 100 to represent the percentage point estimate (and associated error) of the effect of switching from the omitted reference group. *** means statistically significant at the 1 per cent level, ** significant at the 5 per cent level, * significant at the 10 per cent level. '...' indicates that this cell was not estimable due to its small size or was suppressed for quality or confidentiality reasons.

Table 7: Marginal effects from logistic regressions modelling the probability of being abroad through years 5–7

Characteristic	Model 1: Some covariates			Model 2: Most covariates			Model 3: All covariates		
	ME	Sig	SE	ME	Sig	SE	ME	Sig	SE
Sex (reference: Male)									
Female	-1.9	***	0.4	-1.5	***	0.5	-1.5	***	0.5
Age group (reference: 20-24 years)									
< 20	-2.1		1.3	-1.6		1.3	-1.2		1.4
25-29	-4.3	***	0.7	-4.2	***	0.7	-4.7	***	0.8
30-34	-7.0	***	0.7	-6.8	***	0.8	-7.1	***	0.8
35-39	-7.9	***	0.8	-7.8	***	0.8	-8.2	***	0.8
40-49	-9.5	***	0.6	-9.4	***	0.7	-9.8	***	0.7
50+	-11.3	***	0.6	-11.3	***	0.7	-11.7	***	0.7
Ethnicity (reference: European)									
Māori	3.2	***	0.7	2.8	***	0.7	2.7	***	0.7
Pacific peoples	4.1	***	1.2	3.7	***	1.2	3.4	***	1.2
Other	3.5	***	1.2	3.3	***	1.2	3.5	***	1.2
Not stated	-0.6		0.8	-0.8		0.9	-0.8		0.9
Regional council (reference: Northland)									
Auckland				-0.9		1.2	-1.2		1.3
Waikato				-2.0		1.3	-2.0		1.3
Bay of Plenty				0.9		1.4	0.8		1.4
Gisborne				-0.2		2.3	-0.4		2.4
Hawke's Bay				0.1		1.5	0.0		1.5
Taranaki				-1.8		1.5	-2.0		1.6
Manawatu-Wanganui				-2.2		1.3	-2.3	*	1.4
Wellington				-1.3		1.3	-1.3		1.3
Tasman				-0.6		2.2	-0.6		2.3
Nelson				1.7		2.2	1.5		2.3
Marlborough				-3.1		2.0	-3.3		2.1
West Coast				-0.7		2.4	-0.6		2.5
Canterbury				-2.4	*	1.2	-2.6	**	1.3
Otago				-1.8		1.4	-2.0		1.4
Southland				-2.4		1.5	-2.6	*	1.6
Student loan balance (reference: \$0.00)									
\$0.01-\$10,000	2.0	***	0.7	2.4	***	0.7	2.5	***	0.7
\$10,000-\$20,000	1.7		1.1	2.1	*	1.1	2.1	*	1.2
\$20,000+	4.2	***	1.4	4.7	***	1.5	4.5	***	1.5
Qualification level (reference: LCP)									
Level 1	-1.6		1.1	-1.7		1.1	-1.8		1.2
Level 2	0.2		0.7	0.9		0.7	1.2		0.8
Level 3	1.6	**	0.7	1.3	*	0.7	1.3	*	0.7
Level 4	2.1	***	0.6	2.0	***	0.7	2.1	***	0.7
Level 5+	3.3		2.5	3.5		2.5	2.6		2.5
Previous qualification (reference: No previous qualification)									
5th Form (or at least 12 credits at level 1)				0.3		0.8	0.3		0.8
6th Form (or at least 12 credits at level 2)				-0.3		0.8	-0.1		0.8
7th Form (or at least 12 credits at level 3)				0.8		1.0	1.0		1.0
Sub Degree				-1.7	**	0.7	-1.7	**	0.7
Degree				1.2		1.3	1.1		1.3
Not specified				1.4	**	0.7	1.5	**	0.7

Characteristic	Model 1: Some covariates			Model 2: Most covariates			Model 3: All covariates		
	ME	Sig	SE	ME	Sig	SE	ME	Sig	SE
Year left training (reference: 2003)									
2004	0.6		0.4	0.8	**	0.4	0.8	**	0.4
Funding arrangement (reference: ITF)									
MA				1.6		1.0	1.7	*	1.1
Employment status (reference: Employee)									
Self-employed				-3.6	***	1.1			
Industry (reference: Agriculture, forestry and fishing)									
Mining				4.2		3.8	4.0		3.9
Manufacturing				3.0	***	0.9	2.4	**	1.0
Electricity, gas, water & waste				2.8		2.8	2.3		2.9
Construction				4.2	***	0.9	4.1	***	1.0
Wholesale trade				2.8	**	1.4	2.2		1.5
Retail trade				1.2		0.9	0.6		1.0
Accommodation & food				...		...	...		...
Transport, postal & warehousing				4.7	***	1.3	3.8	***	1.4
Information media & telecommunications				4.3		2.8	3.8		2.9
Financial & insurance				1.2		2.1	0.6		2.2
Rental, hiring & real estate				5.0	*	3.0	5.4	*	3.3
Professional, scientific & technical				2.5	*	1.4	2.3		1.5
Administrative & support				3.7	***	1.3	3.2	**	1.4
Public administration & safety				4.2	***	1.2	3.9	***	1.4
Education & training				2.1		1.4	1.8		1.5
Health care & social assistance				3.2	**	1.4	2.7	*	1.5
Arts & recreation				5.5	***	1.5	5.3	***	1.6
Other services				1.0		1.1	1.1		1.2
Proportion in industry training (reference: < 5%)									
5-10%							-0.7		0.7
10-20%							-0.6		0.7
20-40%							-0.3		0.7
40% +							-1.0		0.8
Size of enterprise (reference: < 10 employees)									
10-50							1.7	**	0.7
50-250							2.5	***	0.8
250-1000							1.0		0.8
1000+							1.3		0.8
Earnings as proportion of enterprise mean (reference: < 75%)									
75%-100%							0.1		0.6
100%-125%							1.0		0.7
Over 125%							0.9		0.7
Enterprise mean monthly earnings (reference: < \$1,750)									
\$1,750-\$2,750							1.1		0.7
\$2,750-\$3,750							0.6		0.8
More than \$3,750							1.0		0.9
Diagnostics									
Number of obs	20,886			20,860			20,251		
Pseudo-R2	0.0483			0.0570			0.0564		
Model prediction correct >= 0.5	90.9%			90.8%			90.7%		
Area under ROC curve	0.6689			0.6836			0.6825		

Source: Figures have been extracted from the IDI prototype managed by Statistics New Zealand. Note: Marginal effects (ME) and standard errors (SE) have been multiplied by 100 to represent the percentage point estimate (and associated error) of the effect of switching from the omitted reference group. *** means statistically significant at the 1 per cent level, ** significant at the 5 per cent level, * significant at the 10 per cent level. '...' indicates that this cell was not estimable due to its small size or was suppressed for quality or confidentiality reasons.

Table 8: Predicted probabilities adjusted controlling for most covariates (model 2)

Characteristic:	Count A & C	Count B	A. % that left in years 1-7		B. Of those that left early, % back 4-5 years after leaving		C. % abroad in years 5-7	
			PP	SE	PP	SE	PP	SE
All industry trainee completers	20,886	1,524	17.2	0.2	33.9	1.1	9.1	0.2
Sex								
Male	13,605	1,164	17.9	0.3	32.5	1.3	9.6	0.3
Female	7,281	360	15.8	0.5	38.9	3.0	8.1	0.4
Age group								
< 20	963	60	29.5	1.7	45.4	6.6	13.2	1.3
20-24	4,971	780	29.9	0.7	36.6	1.8	14.8	0.6
25-29	3,111	303	20.5	0.7	37.0	2.7	10.6	0.5
30-34	2,730	132	13.3	0.7	27.7	3.9	8.0	0.5
35-39	2,271	96	11.5	0.7	23.6	4.5	6.9	0.5
40-49	4,119	108	8.7	0.5	16.5	3.6	5.3	0.4
50+	2,724	45	5.3	0.5	...	...	3.4	0.4
Ethnicity								
European	15,198	1,131	16.8	0.3	35.0	1.3	8.6	0.2
Māori	2,784	207	18.8	0.8	30.1	3.3	11.3	0.6
Pacific peoples	954	66	19.5	1.4	24.7	5.8	12.2	1.2
Other	864	63	20.0	1.4	35.9	6.3	11.9	1.2
Not stated	1,089	57	15.9	1.1	31.1	6.1	7.8	0.8
Regional council								
Northland	708	57	20.0	1.4	36.8	6.3	10.4	1.1
Auckland	4,371	342	18.2	0.6	31.3	2.5	9.5	0.4
Waikato	2,232	165	17.3	0.8	38.2	3.6	8.4	0.6
Bay of Plenty	1,371	105	19.2	1.0	30.4	4.3	11.4	0.8
Gisborne	231	15	21.2	2.7	...	...	10.2	2.0
Haw ke's Bay	993	72	17.6	1.2	29.3	5.2	10.6	1.0
Taranaki	900	54	15.7	1.3	35.8	6.7	8.6	1.0
Manaw atu-Wanganui	1,590	120	16.1	0.9	39.5	4.4	8.3	0.7
Wellington	2,304	168	16.3	0.7	29.1	3.4	9.2	0.6
Tasman	294	12	17.9	2.4	...	...	9.9	1.9
Nelson	306	219	19.7	2.3	...	...	12.1	1.9
Marlborough	255	93	14.6	2.2	...	...	7.3	1.7
West Coast	195	48	13.3	2.3	...	...	9.8	2.1
Canterbury	3,195	18	15.9	0.6	36.5	3.1	8.0	0.5
Otago	1,137	24	17.6	1.0	39.1	4.8	8.7	0.8
Southland	777	21	15.9	1.3	...	...	8.0	1.0
Student loan balance								
\$0.00	17,877	1,188	16.5	0.3	34.7	1.3	8.7	0.2
\$0.01-\$10,000	1,866	207	19.0	0.8	30.2	3.1	11.1	0.7
\$10,000-\$20,000	657	69	20.9	1.4	33.8	5.8	10.8	1.1
\$20,000+	486	60	24.8	1.7	31.8	6.4	13.4	1.5
Destination								
Australia		1,092			29.0	1.4		
Elsew here		435			45.4	2.4		
Qualification level								
LCP	3,573	138	14.5	0.7	38.3	4.9	7.9	0.5
Level 1	642	24	11.5	1.4	...	...	6.1	1.0
Level 2	3,861	231	16.4	0.6	27.3	3.1	8.8	0.5
Level 3	5,490	330	16.2	0.5	30.9	2.6	9.2	0.4
Level 4	7,065	792	19.7	0.5	36.8	1.8	9.9	0.4
Level 5+	258	9	17.1	3.0	...	...	11.3	2.4

Characteristic:	Count A & C	Count B	A. % that left in years 1-7		B. Of those that left early, % back 4-5 years after leaving		C. % abroad in years 5-7		
			PP	SE	PP	SE	PP	SE	
Previous qualification									
No Previous Qualifications	2,934	177	17.0	0.7	30.9	3.5	8.8	0.6	
5th Form (or at least 12 credits at level 1)	2,574	192	17.5	0.7	31.9	3.3	9.1	0.6	
6th Form (or at least 12 credits at level 2)	2,133	189	16.8	0.7	36.9	3.4	8.5	0.6	
7th Form (or at least 12 credits at level 3)	978	78	17.0	1.0	37.0	5.4	9.6	0.8	
Sub Degree	3,162	207	14.8	0.6	45.0	3.4	7.1	0.5	
Degree	705	60	20.5	1.5	37.9	6.7	10.0	1.2	
Not specified	8,400	621	18.0	0.4	29.8	1.8	10.2	0.3	
Year left training									
2003	9,102	780	16.8	0.4	36.7	1.7	8.7	0.3	
2004	11,784	747	17.5	0.3	31.0	1.6	9.5	0.3	
Funding arrangement									
ITF	20,196	1,401	17.1	0.3	34.7	1.2	9.1	0.2	
MA	687	123	18.7	1.2	25.3	3.8	10.7	1.0	
Employment status									
Employee	20,265	1,506	17.3	0.3	...	...	9.2	0.2
Self-employed	621	21	13.1	1.6	...	...	5.6	1.1
Industry									
Agriculture, forestry & fishing	1,029	57	12.4	1.0	32.6	6.3	6.5	0.8	
Mining	87	6	27.4	5.0	...	...	10.7	3.7
Manufacturing	4,143	312	17.8	0.6	33.3	2.7	9.5	0.5	
Electricity, gas, water & waste	126	15	20.0	3.6	...	...	9.4	2.7
Construction	2,661	345	19.6	0.7	35.8	2.6	10.7	0.6	
Wholesale trade	615	45	17.0	1.5	...	...	9.3	1.2
Retail trade	2,466	150	15.0	0.7	32.0	3.7	7.7	0.5	
Accommodation & food	1,857	..	...	...	...	...	...	...
Transport, postal & warehousing	1,125	48	20.6	1.4	...	...	11.2	1.1
Information media & telecommunications	144	9	21.8	3.5	...	...	10.8	2.7
Financial & insurance	195	9	14.5	2.6	...	...	7.7	2.0
Rental, hiring & real estate	132	9	17.3	3.4	...	...	11.5	2.9
Professional, scientific & technical	627	36	16.8	1.5	...	...	9.0	1.2
Administrative & support	897	57	18.1	1.3	21.6	5.6	10.2	1.1	
Public administration & safety	1,293	87	19.8	1.2	31.1	5.2	10.7	0.9	
Education & training	495	48	16.9	1.5	...	...	8.6	1.2
Health care & social assistance	1,554	45	18.8	1.4	...	...	9.7	1.1
Arts & recreation	627	63	22.2	1.5	29.0	5.5	12.0	1.3	
Other services	777	69	13.5	1.0	35.8	5.6	7.5	0.8	

Source: Figures have been extracted from the IDI prototype managed by Statistics New Zealand. Note: Predicted probabilities (PP) and standard errors (SE) have been multiplied by 100 to represent the percentage point estimate (and associated error) of the effect of switching from the omitted reference group. *** means statistically significant at the 1 per cent level, ** significant at the 5 per cent level, * significant at the 10 per cent level. '...' indicates that this cell was not estimable due to its small size or was suppressed for quality or confidentiality reasons.

Table 9: Probability of being abroad through years 5–7, by field of study

a) Industry trainees, unadjusted

Field of study	Number of trainees	LCP	Level 1-2	Level 3	Level 4+
Engineering	6,261	6.1	8.6	8.2	13.6
Building	1,770	...	...	10.7	14.8
Agriculture	1,191	...	8.7	7.5	8.5
Health	537	...	...	...	6.8
Commerce	3,669	5.1	...	9.3	6.3
Humanities	2,661	...	...	7.9	7.7
Hospitality	4,635	...	8.2	...	8.2
All trainees	20,886	6.0	8.3	8.9	11.5

b) Industry trainees, controlling for some covariates (model 1)

Field of study	Number of trainees	LCP	Level 1-2	Level 3	Level 4+
Engineering	6,261	5.9	11.6	10.2	11.9
Building	1,770	...	...	8.9	12.1
Agriculture	1,191	...	7.8	7.7	10.0
Health	537	...	...	...	12.8
Commerce	3,669	4.4	...	8.7	9.9
Humanities	2,661	...	...	7.9	11.3
Hospitality	4,635	...	6.8	...	9.5
All trainees	20,886	6.0	8.3	8.9	11.5

c) Industry trainees, controlling for most covariates (model 2 without industry)

Field of study	Number of trainees	LCP	Level 1-2	Level 3	Level 4+
Engineering	6,261	5.8	11.4	10.2	11.9
Building	1,770	...	...	8.8	11.9
Agriculture	1,191	...	8.4	8.5	10.2
Health	537	...	...	...	11.9
Commerce	3,669	4.7	...	8.7	10.7
Humanities	2,661	...	...	8.9	11.6
Hospitality	4,635	...	6.9	...	9.5
All trainees	20,886	6.0	8.3	8.9	11.5

d) Industry trainees, controlling for all covariates (model 3 without industry)

Field of study	Number of trainees	LCP	Level 1-2	Level 3	Level 4+
Engineering	6,261	5.6	11.6	9.9	12.0
Building	1,770	...	...	9.0	12.6
Agriculture	1,191	...	9.9	8.3	11.1
Health	537	...	...	...	12.5
Commerce	3,669	4.2	...	9.0	10.7
Humanities	2,661	...	...	9.5	10.6
Hospitality	4,635	...	6.8	...	9.6
All trainees	20,886	6.0	8.3	8.9	11.5

Source: Figures have been extracted from the IDI prototype managed by Statistics New Zealand. Note: All counts behind this table have been randomly rounded to base 3. '...' indicates that this cell was not estimable due to its small size or was suppressed for quality or confidentiality reasons.

