Te Pōkai Tara
Universities
New Zealand

About the Tool

The Graduate Outcomes Tool (the Tool), developed by Universities New Zealand (UNZ), presents the economic and employment outcomes of tertiary graduates who completed studies between 2009 and 2015, and follows their outcomes for up to 6 years following the completion of their studies.

The Graduate Outcomes Tool was developed using the Integrated Data Infrastructure[1] (IDI). Monthly indicators on the economic outcomes of graduates are constructed to present a dynamic story about the transition and outcomes of graduates. The Tool sets out the outcomes of domestic graduates by ethnicity, gender, level of study, subsector (university or non-university graduates) and broad field[2] of completed study. Outcomes for typical young or mature domestic graduates[3] can be analysed separately, while outcomes for international graduates are grouped only by level of study, subsector and broad field of study.

This report accompanies the release of the Tool, explains the methodology and business rules applied in developing it and provides a high-level summary of the main findings for a selected subgroup of graduates as an illustration of how it can be used.

As our collective understanding of graduate outcomes increases, the quality of data improves and its coverage extends—and with feedback from users on the indicators and functionality of the Tool—UNZ intends to continue refining indicators, extending the follow-up timeframe and contributing to evidence on the socio-economic outcomes of tertiary graduates.

Background

To observe the long-term outcomes of graduates, we focus on three consecutive cohorts[4] of graduates, those who completed their studies in 2009, 2010 and 2011. Their outcomes can be fully observed for up to 6 years. The number of graduates in each cohort, when grouped by demographics and the characteristics of completed degrees, is not large enough to construct statistically meaningful indicators by field of study. Therefore, we constructed

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[1] Integrated Data Infrastructure (IDI) is linked and anonymous research microdata maintained by Statistics New Zealand. http://archive.stats.govt.nz/browse_for_stats/snapshots-of-nz/integrated-data-infrastructure.aspx

[2] According to New Zealand Standard Classification of Education (NZSCED), there are 12 broad field of study. https://www.educationcounts.govt.nz/data-services/collecting-information/code-sets-and-classifications/new_zealand_standard_classification_of_education_nzsced

[3] We used the Ministry of Education's definition of young graduates, where the age cut-off rule applied for qualification completed. For example, those who were age 27 or younger they completed a master's degree are considered young graduates.

[4] Cohorts are defined by the year of the last enrolment in the programme

indicators for combined cohorts,[5] to enable users to analyse outcomes by broadly defined fields of study.

We make a clear distinction between university graduates, non-university graduates, domestic graduates and international students, young and mature graduates. We also present the outcomes of graduate cohorts from 2012 to 2015 to enable a comparison between the outcomes of more recent cohorts with those of earlier cohorts. The most recent cohort is graduates from 2015 and most of their outcomes can be observed for up to two years, until the end of 2017.

For each cohort of graduates, two distinct subgroups are identified: university and non-university graduates. This is done mainly to allow us to compare the outcomes of graduates from university sector with those from the rest of tertiary sector.

Furthermore, we make a clear distinction between domestic and international graduates. The pathways and outcomes of these groups should be analysed separately. For domestic students, users can select specific demographic subgroups: by gender, prioritised ethnicity, field of study and the characteristics of completed degrees.

Users also can separate outcomes for typical young graduates or mature graduates. For international graduates, information can be analysed only by the characteristics of completed degrees and field of study. Comparative cohort analysis can be done on multiple cohorts at the same time across all indicators. This is to allow users to compare and monitor the outcomes of recent cohorts with earlier cohorts. We also allow users to combine multiple cohorts and compare multiple indicators on the same graph.

This interactive tool also enables users to observe trends in those returning to tertiary education. It will be useful in helping understand graduate outcomes and developing government and sectoral policies to support transition from tertiary education into the work force, and policies to encourage a return to tertiary education.

What is known about the outcomes of New Zealand graduates?

The Ministry of Education has carried out extensive work in this space. Factsheets on graduate outcomes and various research reports are available on the Ministry's website,[6] along with downloadable tables containing aggregated summary on earnings and destinations of gradates. The focus is on main economic activities, destination and earnings in post-study years.

All findings consistently indicate the positive relation between the level of qualification completed, employment, earnings and overseas departure, ie, the higher the level of qualification completed, the higher the percentage of overseas departures and the higher the percentage employed for those who remain in the country, as well as higher earnings on average for those who are employed. The existing evidence also suggests that those who

[5] Combined cohorts means the combined population of graduates completed studies between 2009-2011
[6] https://www.educationcounts.govt.nz/publications/tertiary_education

complete a higher-level qualification are more likely to be in the workforce and engaged in education and training, as well as less dependent on government benefits.

Employment outcomes and further tertiary education vary across field of study. The factsheets[7] published by the Ministry of Education in 2017 summarise the evidence on postgraduate outcomes of New Zealand graduates.

Development of the Tool

With the development and expansion of the IDI in recent years, the Ministry of Education has published on its website tables about the post-study destinations and earnings of graduates.[8] These tables aggregate the annual information for post-study years (up to 11 years post-study) and indicate both the proportion of students estimated to be overseas, in employment and studying, and the median[9] annual income for those who are employed. Information is available for domestic and international graduates by level of completed degree and specific field of study.

In the May 2018, the Tertiary Education Commission (TEC) published an online interactive tool on graduate outcomes. The TEC used the same methodology and data sources as the Ministry to develop an online interactive tool, presenting the same information but with visualisations. The TEC's tool presents information at each provider level, but the tool is accessible only to tertiary institution providers and organisations with approved educational credentials.[10]

We are taking a different methodological approach to measuring graduate outcomes. Various events can take place in the year following graduation: former students may be supported by a benefit while looking for jobs; they may move into employment or decide to spend time overseas, travelling and returning to re-enrol in higher level studies. All these events might happen sequentially or simultaneously in one year.

Summarising and deciding on a graduate's main status in a year requires prioritising data, and much information about the transition and pathways of graduates is lost. To further complicate matters, these decisions and events—although generally occurring once individuals finish studying—may also happen when students are still studying. Because most tertiary institutions run on a trimester basis, graduates may finish final papers and courses towards qualifications at different times.

We advocate taking a different approach to the one taken by the Ministry and TEC. We suggest following students from the month they leave tertiary institutions (the reference

[7] https://www.educationcounts.govt.nz/publications/tertiary_education/education-outcomes/the-post-study-earnings-and-destinations-of-young-domestic-graduates

[8] https://www.educationcounts.govt.nz/statistics/tertiary-education/life_after_study

[9] Median is a measure of central tendency of a data and found by ordering the set from lowest to highest and finding the exact middle. https://www.statisticshowto.datasciencecentral.com/probability-and-statistics/statistics-definitions/mean-median-mode/

[10] https://ngakete.tec.govt.nz/

month) and measuring their status on a monthly basis. Using this tool, we follow students for 72 months (six years after study).

Changing economic activity and employment status each month is typical, especially during the early months after graduation. Finding a permanent job takes time and some students may decide to have a post-study break. We believe that measuring outcomes each month provides a much richer picture of transition and post-study graduate outcomes.

In addition, once graduates leave the country, little is known about whether they engage in employment or education, or spend time traveling. Hence the employment- and training-related outcomes should be measured only for the population that remains in the country. This differs from the methodology currently used by Ministry of Education.

All previous work on the outcomes for New Zealand graduates has focused on economic activities, destination and earnings in the post-study years. Very little attention has been paid to graduates' return to tertiary education and geographical mobility in these years. Information on individuals' addresses is patchy and incomplete, but for those who engage in paid employment (a significant majority of graduates who remain in the country) the employers are known and hence their proximate location. Such information can be used as a proxy for the geographical destination of graduates, and change in employment through change in employer can be also measured. By linking characteristics of businesses employing graduates, we can gain more insights on the post-study employment outcomes of graduates.

Outcomes measured

The IDI brings together administrative data from a range of ministries and government departments: the Ministry of Social Development, Oranga Tamariki, New Zealand Customes Department, the Ministry of Education, Inland Revenue, the Ministry of Health, the Department of Corrections and other agencies.

Datasets are provided to Statistics NZ and are linked on a person or business unit level. Statistics NZ uses identifying information and matches records using a specific matching methodology[11] that is constantly being refined and improved. Identifying information is removed and anonymised data made available to researchers. The Graduate Outcomes Tool visually presents summary information for selected cohorts of graduates. Measured monthly outcome indicators are presented in **Table 1** below.

[11] http://www.stats.govt.nz/browse_for_stats/snapshots-of-nz/integrated-data-infrastructure/idi-resources.aspx.

Table 1: Outcome indicators measured in the Graduate Outcomes Tool

Indicator	Description
Overseas	An individual is considered 'overseas' if they spend more than 15 days overseas in a month post study. The tool calculates the proportion of population overseas in each follow-up month.
The following indicators are proportions and calculated as a percentage of the population that is not overseas and not in custody at a correctional facility.	
On a benefit	An individual is considered to be supported by a benefit if they receive one of the main government benefits for at least 20 days in a month. These benefits include Youth Payments, Young Parent Payments, Supported Living Repayments, and Job Seeker Support benefits. They exclude accommodation supplements and other one-off, irregular benefit payments and allowances.[12] The Tool presents the proportion of graduates supported on a benefit in the post-study months. This indicator is available for domestic graduates only.
Job Seeker benefit	An individual is supported by Job Seeker benefit if they are on this benefit for at least one day in a month. The tool presents the proportion of graduates receiving a Job Seeker benefit in the post-study months. This indicator is available for domestic graduates only.
Enrolled in tertiary study	An individual is enrolled in tertiary study if they are enrolled in formal tertiary studies for at least one day in a month. The tool presents the proportion of graduates re-enrolled in tertiary studies in the following months.
Enrolled at university	This indicator identifies the proportion of graduates re-enrolled in formal tertiary studies at a NZ university.
Enrolled in higher level studies at university	This indicator identifies graduates re-enrolled at a university and studying towards a higher-level qualification after previously completing a lower-level qualification. The tool presents the proportion of graduates in the follow-up months who meet these criteria.
Employed	An individual is considered to be employed if they earn wages or salary (more than 10 dollars in a month) or were self-employed[13] in the relevant fiscal year. The tool presents the proportion of graduates earning wages, salary or self-employed income.
Employed on wages or salaries	An individual is considered to be employed on wages or salaries, if they earn more than 10 dollars before tax on wages and salaries only in a follow-up month.

[12] https://www.workandincome.govt.nz/products/benefit-rates/benefit-rates-april-2018.html

[13] IDI does not hold monthly self-employment data, but annual self-employment income is available. The annual amount of self-employment income is evenly distributed into corresponding months. The assumption is that a self-employed graduate is working every single month in the year and that annual earnings are evenly distributed during the year. This is not accurate, but is the only reasonable assumption that can be made, given no information is available for researchers.

Indicator	Description
Not in labour force or education	This indicator identifies graduates who are in the country, but not engaged in any paid employment or formal educational training and not supported by government benefit. The tool presents the proportion of graduates in the follow-up months that meet these criteria.
Monthly earnings indicators are average and median gross (before tax and deductions) earnings and calculated for those who are employed in the follow-up month. All monthly gross earnings are converted into December 2017 equivalent dollars.	
Earnings from wages or salary	Earnings are accounted when an individual earn more than 10 dollars before tax in a follow-up month. The tool presents the average and median income of graduates in follow-up months.
Mobility indicators are calculated only for those on paid wages and salaries and whose employer's information is known. These indicators are measured as a proportion of those who were employed on wages and salaries in the follow up month.	
Regional and district[14] mobility	We use the employer's location as a proxy measure of a graduate's location. We measure the mobility of graduates across regions and at the district level (ie, Territorial Authority). A change in region or district is measured when an individual started a job in a different region or district of employment.
Employer change	For those who are employed and on wages or salaries, using an employer unique identifier, we created an indicator that measures change in employer. Change in employer happens when graduate starts a new job, with a difference employer.

Demographic and graduate profile of combined cohorts

Here we present the profile of selected three consecutive cohorts of graduates: those who completed tertiary qualifications in 2009, 2010 and 2011. The tool presents their monthly outcomes for the six years after study has been completed. This is for demonstration purposes and to provide some high-level descriptive profiles of study cohorts.

Tables 2 and 3 show the demographic and study profile of combined cohorts (2009, 2010 and 2011). The demographic profiles of graduates of each cohort are very similar. **Table 2** presents the demographic profile of domestic and international graduates of the combined cohorts. Domestic and international graduates of each observed cohort also have a similar demographic profile as a group. However, there are obvious and apparent differences in gender and age group composition between domestic and international graduates.

It should be noted that the Tool does not allow a cohort to be selected by age-group bands or region of citizenship for international graduates. The numbers are not large enough to calculate indicators when we group cohorts by age group and/or region of citizenship. The

[14] We are referring to 68 Territorial authorities. See the full list here: http://archive.stats.govt.nz/methods/classifications-and-standards/classification-related-stats-standards/territorial-authority.aspx

information on age-group composition and citizenship regions are presented below only to provide more insight into the demographic composition of cohorts.

Table 2: Demographic and study profile of cohorts

	Combined cohorts 2009 - 2011		Domestic graduates			International graduates		
	Domestic graduates	International graduates	Cohort 2009	Cohort 2010	Cohort 2011	Cohort 2009	Cohort 2010	Cohort 2011
Total graduates	367,047	36,852	116,463	125,412	125,172	11,511	12,225	13,119
			Percentages					
Gender								
Male	40.2	50.3	40.5	41.2	38.8	50.5	50.5	49.8
Female	59.8	49.7	59.5	58.8	61.2	49.5	49.4	50.1
Prioritised ethnicity								
NZ European	51.5		52.2	51.7	50.5			
Maori	25.5		25.0	25.5	26.0			
Pasifika	8.1	na	7.5	8.0	8.7		na	
Asian	12.6		13.1	12.5	12.4			
Other	2.3		2.2	2.3	2.4			
Mature graduate	61.4	na	62.7	62.0	59.6		na	
Young graduate	38.6		37.3	38.0	40.4			
Age groups								
Under24	42.4	41.9	40.7	42.0	44.3	40.9	40.9	43.6
25-29 old	11.6	34.1	11.2	11.7	11.9	36.7	34.0	31.9
30-34 old	8.3	12.4	8.4	8.2	8.2	11.8	12.9	12.5
35-44 old	16.3	8.7	17.0	16.4	15.6	7.8	9.1	9.2
45-54 old	13.4	2.3	14.0	13.6	12.7	2.3	2.4	2.3
55 and above	8.0	0.6	8.6	8.1	7.3	0.5	0.8	0.5
Region of citizenship								
Africa		1.8				1.7	1.9	1.7
Asia		78.0				78.9	78.3	76.8
Central and South America		1.5				1.2	1.4	1.9
Europe	na	6.9		na		7.4	6.9	6.4
Middle East		4.1				3.3	3.6	5.4
Northern America		2.4				2.6	2.3	2.3
Pacific		5.1				4.7	5.3	5.2

Notes: This is the profile of combined cohorts (2009-2010). Ethnicity categories presented here are as self-reported to enrolled providers and they represent prioritised ethnicity. Percentages are of the total number of graduates. The Graduate Outcomes Tool does not allow specific age groups and region of citizenship for cohorts to be selected.

Table 3 shows the study profile of the highest completed degree of graduates. It shows that the study profiles of graduates across cohorts are very similar and as expected, with noticeable differences in the study profile of domestic and international students. About 30 percent of domestic graduates and about half of international graduates are graduates from university sector.

Table 3: Graduate profile of domestic and international graduates

	Combined cohorts 2009 - 2011		Domestic graduates			International graduates		
	Domestic graduates	International graduates	Cohort 2009	Cohort 2010	Cohort 2011	Cohort 2009	Cohort 2010	Cohort 2011
Total graduates	367,047	36,852	116,463	125,412	125,172	11,511	12,225	13,119
		Percentages						
Tertiary provider								
Polytechnic	36.0	24.7	36.4	36.9	34.6	22.9	24.0	26.9
Private Training Establishment	20.0	25.2	19.9	19.7	20.5	24.1	25.3	26.0
University	27.3	47.5	27.6	26.3	27.9	50.8	47.8	44.4
Wananga	16.7	2.6	16.1	17.1	17.0	2.1	2.9	2.7
Completed degree								
Level 1 - 4 certificates	57.1	24.4	57.8	58.2	55.6	25.1	23.8	24.5
Diplomas	13.1	24.1	12.7	13.2	13.5	21.8	24.7	25.6
Bachelors	17.1	25.0	17.1	16.2	17.9	27.5	24.5	23.4
Level 7 graduate certs/diplomas	9.8	15.5	9.5	9.9	10.0	15.0	16.1	15.4
Masters	2.4	8.3	2.4	2.2	2.5	8.2	8.4	8.2
Doctorates	0.4	2.6	0.5	0.4	0.4	2.4	2.6	2.9
Completed field of study								
Natural and Physical Sciences	3.4	6.0	3.5	3.4	3.5	6.3	6.0	5.8
Information Technology	6.0	8.1	5.9	5.7	6.3	8.9	8.0	7.5
Engineering and Related Technologies	7.6	5.3	7.7	8.4	6.5	5.3	5.9	4.8
Architecture and Building	2.9	1.6	2.7	2.8	3.3	1.8	1.5	1.6
Agriculture, Environmental and Related Studies	6.6	1.7	7.0	7.3	5.6	2.2	1.9	1.1
Health	9.1	7.3	8.7	9.1	9.4	6.7	7.5	7.7
Education	6.8	4.0	6.5	6.8	7.2	3.3	3.9	4.7
Management and Commerce	19.0	31.7	18.7	18.8	19.6	33.0	31.5	30.6
Society and Culture	22.8	16.8	23.9	22.0	22.6	16.3	15.0	18.9
Creative Arts	7.0	4.0	7.1	6.8	7.1	3.9	4.2	3.8
Food, Hospitality and Personal Services	5.2	8.3	4.9	5.5	5.2	8.0	9.4	7.4
Mixed Field Programmes	3.5	5.1	3.2	3.4	3.7	4.2	5.0	6.1

Notes: In cases where a student has completed several qualifications, study characteristics are related to the highest completed degree in a year. Percentages are of the total number of graduates. In the Graduate Outcomes Tool, all subsectors other than universities are combined and the field of completed study is available only for combined cohorts.

Graduate outcomes

Users can opt to select and define the population whose outcomes they want to observe. For a demonstration, in this report we selected bachelor's degree university graduates of the combined cohorts, who completed studies in the field of management and commerce. We restricted this population by demographic characteristics, limiting it to NZ European female young graduates.

When interpreting, it should be noted that the indicators measure the activity or earnings in a single month or present a monthly picture for this selected subgroup. By putting together monthly snapshots in chronological order, we are trying to present the dynamic picture of the selected population of interest. All graphs presented in this section illustrate the outcomes for this selected subgroup.

Proportion overseas

Figure 1 shows the increasing trend in the proportion of cohorts of graduates that spend more than half of the month overseas during the follow-up months (see Figure 1).

Figure 1: The proportion overseas

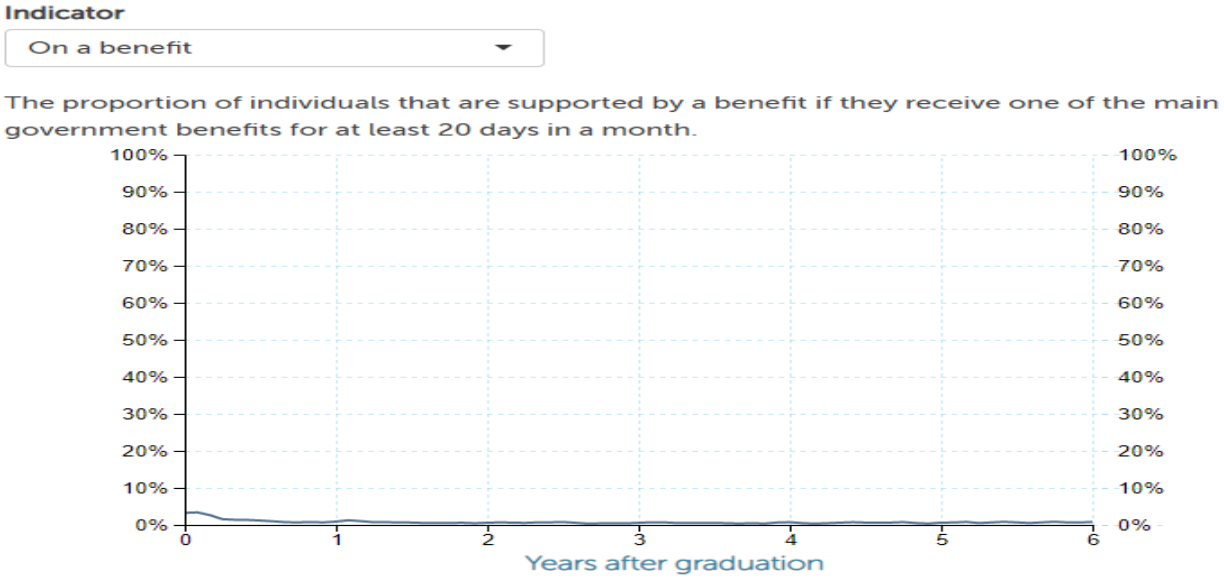
Notes: NZ European female young graduates who completed bachelor's degrees in the field of management and commerce from NZ universities. Source: Universities NZ Graduate Outcomes Tool https://universitiesnz.shinyapps.io/graduateoutcomesonlinetool/

It shows an increasing trend in the proportion of graduates who are overseas. For the selected group, about 10-15 percent of graduates are predominantly overseas in the first post-study year. Towards the sixth year, about 30 percent of graduates are mainly overseas. Gaining work experience, repaying student loan debt and having savings to travel overseas are the most likely reasons for the trend increasing over time for domestic students. Very different trends are evident for international students, most of whom leave the country soon after completing their studies.

Proportion supported by benefit

Figure 2 shows the trend in the proportion of selected graduates supported by government benefits. It shows that only a very small proportion of graduates from the selected subgroup are supported by government benefits in any month after study. For this selected subgroup, fewer than 5 percent of selected graduates are being supported by the benefit in the first few months after study, with the proportion of graduates gradually dropping to less than 0.5 percent towards the sixth year after study. These are mainly those who need short-term assistance during the transition from training into workforce.

Figure 2: The proportion supported by benefit



Notes: NZ European female graduates who completed bachelor's degrees from NZ universities in the field of management and commerce. Source: Universities NZ Graduate Outcomes Tool https://universitiesnz.shinyapps.io/graduateoutcomesonlinetool/

In general, people with tertiary qualifications are less likely to be dependent on a benefit, and the proportion of graduates supported by benefits decreases over time. However, depending on the qualification level completed and the demographic profile of graduates, the benefit uptake varies: the higher the completed level of tertiary qualification, the lower the benefit uptake.

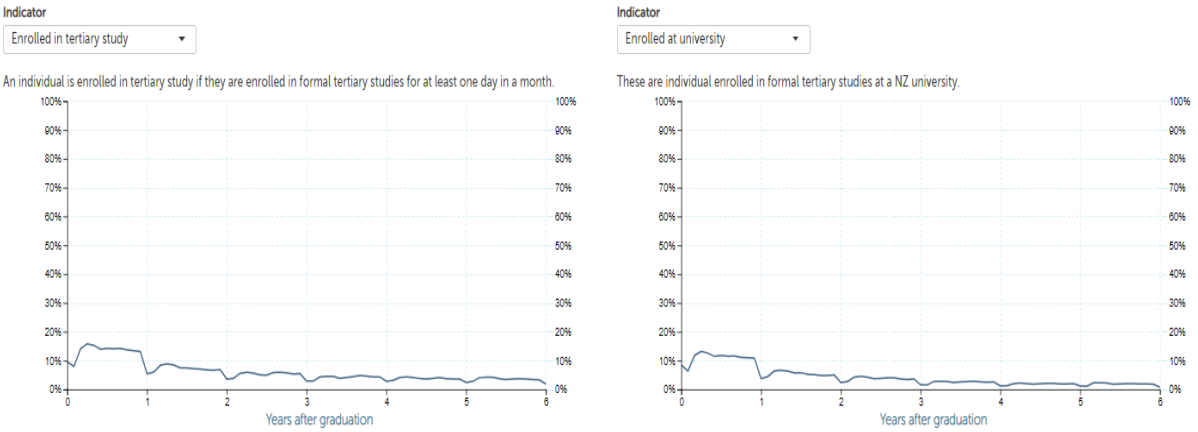
Benefit uptake rates for Māori and Pasifika graduates are usually higher than their NZ European and Asian peers. For example, about 40 percent of Māori female graduates who complete level 1-4 certificates from the non-university sector in the fields of management and commerce are supported by benefits in the first year after study, slightly dropping to 35 percent towards the 6th year after study, when about 15 percent are supported by the Job Seeker benefit. The remaining 20 percent are supported by other benefits, mainly by the Solo Parent Support related benefit (formerly known as DPB, especially for female graduates), sickness-related benefits or other types of benefit.

Return to tertiary education

Through linked data, we monitored whether graduates return to tertiary education. Return to tertiary education depends on the field of study as well as the level of the completed degree. For the selected subgroup of population, the return to tertiary education is very low; once they have completed a bachelor's degree, about 10-15 percent of graduates re-enrol in the first year after graduation. It seems that most of these returning graduates return to university in the first year after study. The proportion of returning graduates declines to less than 5 percent of graduates returning to tertiary education in the sixth year after study (see Figure 2).

This is different for young bachelor's graduates who complete studies in the field of architecture and building, of whom about 50 percent return to tertiary education for further study in the first two years after study. An individual's return to education is driven not only by personal educational desires or needs but also by industry-specific requirements for employment prospects, career advancement and progression as well as by how some tertiary providers design their academic programmes.

Figure 3. Return to education



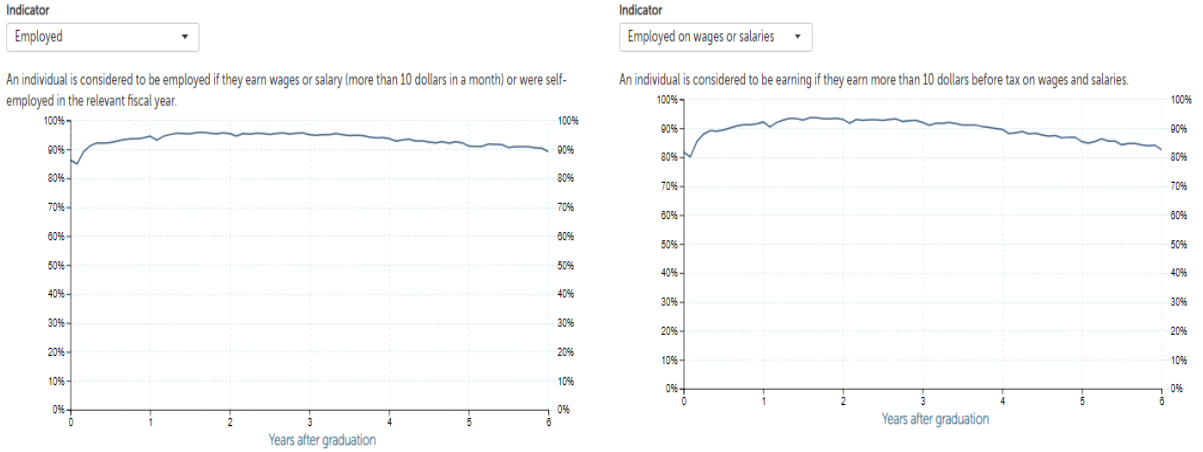
Notes: NZ European female young graduates who completed bachelor's degrees from NZ universities in the field of management and commerce. Source: Universities NZ Graduate Outcomes Tool https://universitiesnz.shinyapps.io/graduateoutcomesonlinetool/

Employment rate and earnings

IDI holds monthly earnings information for individuals on wages or salaries, and annual tax returns for those who are self-employed. For the self-employed, we assume that employment occurs during all the months of the year. This might not be the case for many self-employed people but is the only reasonable assumption we can make based on the information available. Therefore, we have created two indicators of employment rates: one that measures employment rates for those on wages or salaries and a second that includes both wages or salaries and self-employment. The difference in rates between these indicators represents the percentage of self-employed.

Figure 4 illustrates the employment rates for the selected population of NZ European young female graduates with bachelor's degrees from NZ universities in the field of management and commerce. It shows that once graduates gain 2-3 years of work experience, there is an increase in the number of graduates who become self-employed (the difference between proportions presented in Figure 4 are proportions of self-employed graduates). The overall gradual decline in the proportion of graduates employed is also associated with an increasing proportion of those who are not in labour force or education (see the section on Not in labour force or education).

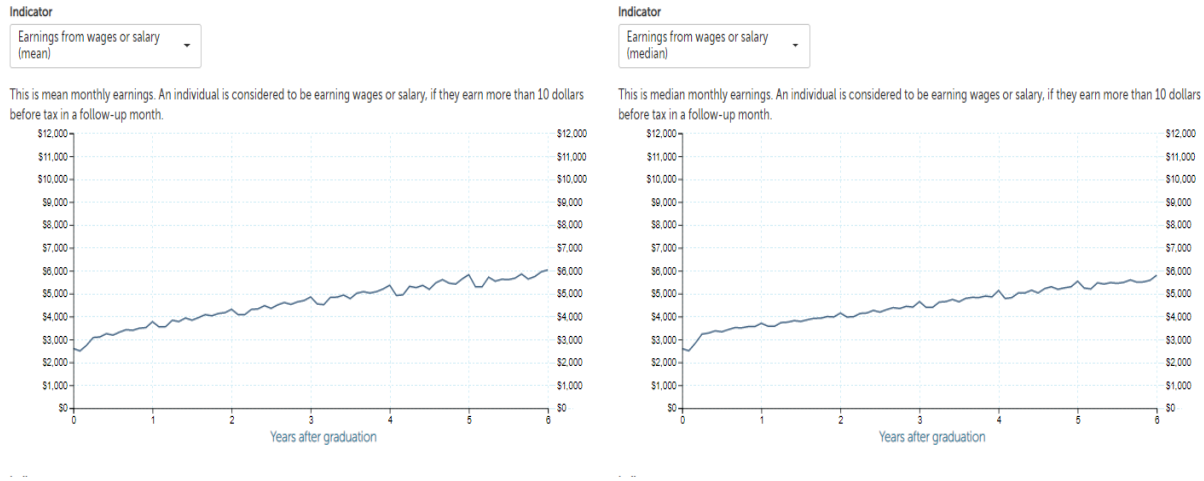
Figure 4. Employment rates



Notes: NZ European young female graduates who completed bachelor's degrees from NZ universities in the field of management and commerce. Source: Universities NZ Graduate Outcomes Tool https://universitiesnz.shinyapps.io/graduateoutcomesonlinetool/

The tool also presents average and median monthly earnings for those employed on wages or salaries. We aimed to remove the impact of inflation on earnings over the six years of the follow-up period, so all monthly earnings are converted to 2017 equivalent dollars using the Statistics New Zealand Consumer Price Index.[15] **Figure 5** presents average and median monthly earnings for this selected group of graduates.

Figure 5. Average and median monthly earnings



Notes: NZ European female graduates who completed bachelor's degrees from NZ universities in the field of management and commerce. Source: Universities NZ Graduate Outcomes Tool https://universitiesnz.shinyapps.io/graduateoutcomesonlinetool/

Currently the IDI does not hold any information about hours employed or positions held in an organisation or business entity, but location and type of employer is known. We hope to

[15] Statistics New Zealand Consumers price index time series. https://www.stats.govt.nz/topics/consumers-price-index

update the Graduate Outcomes Tool once richer employment information becomes available.

Not in labour force or education

This indicator reflects the proportion of graduates not in paid employment or formal education training, or on main government benefits.

When interpreting this indicator, it should be noted that not all employment and training is captured by administrative data, for example, unpaid activities such as volunteering and participation in online training provided by overseas education providers. We have not used industry training data in this version of the Tool, but believe that those enrolled with industry training providers are training in conjunction with work, so they will be captured as employed. Individuals who are not in the labour force may be stay-at-home parents looking after young children, housewives/househusbands, individuals not actively looking for employment or individuals actively looking for employment but not receiving any government job seeker-related assistance.

For our selected population, about 5 percent are not in the labour force or education in the first year after completing study; the proportion of graduates not in the labour force or education remains stable at 5 percent during the 1st to 4th year after completing study but starts steadily increasing and by the end of the 6th year the proportion of graduates not in the labour force increases to 10 percent (see **Figure 6** below). This is most likely due to young female graduates becoming stay-at-home mothers, as the same increasing trend does not occur for male European graduates who complete bachelor's degrees at NZ universities in the same field.

Figure 6: Not in labour force or education

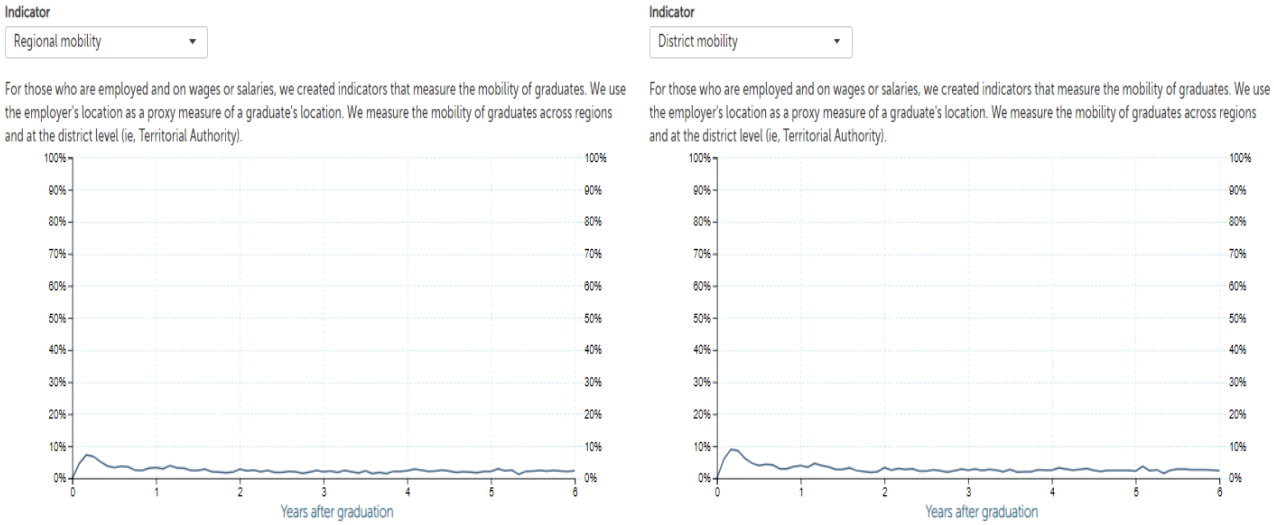
Notes: NZ European young female graduates who completed bachelor's degrees from NZ universities in the field of management and commerce. Source: Universities NZ Graduate Outcomes Tool https://universitiesnz.shinyapps.io/graduateoutcomesonlinetool/

Mobility indicators

We calculated three indicators that can be used as a proxy for graduate mobility during the post-study period. Mobility indicators are calculated only for those who are in the country and earning wages and salaries, because the IDI contains information on the location of the business but does not have complete historical information on residential addresses of individuals.

We assume that individuals will live near their work. Although this is true for a significant majority of employed people, this is not entirely correct for those who work from home or remotely with long commutes to work. **Figure 7** shows the percentage of graduates who change their work region and district in post-study months. This is in addition to graduates who are overseas. According to Figure 7, fewer than 10 percent of graduates employed on wages and salaries move across regions based on employment.

Figure 7. Employment region and district change



Notes: NZ European female graduates who completed bachelor's degrees from NZ universities in the field of management and commerce. Source: Universities NZ Graduate Outcomes Tool
https://universitiesnz.shinyapps.io/graduateoutcomesonlinetool/

Employment changes within the same region will not be reflected by the regional mobility indicator but movements across the region are captured by district change indicator. Similarly, movements within the same district with not be reflected by district change indicator but all employment changes where graduates change employer will be captured by change of employer indicator.

Figure 8: Change of employer

Notes: NZ European young female graduates who completed bachelor's degrees from NZ universities in the field of management and commerce. Source: Universities NZ Graduate Outcomes Tool https://universitiesnz.shinyapps.io/graduateoutcomesonlinetool/

Linked IRD data contains a unique identity for employers. This can be measured only for those in paid employment with a registered business entity. **Figure 8** above shows the percentage of graduates who change employer at any month after study.

For our selected subgroup of graduates, the employment changes are greater in the first six months after completing study, as about 5-8 percent of graduates change employer in follow-up months. Some of these employment changes in the first year after study are likely to be attributed to the change from casual employment while being a student to more permanent professional employment.

Concluding remarks, caveats and disclaimer

This report explains the post-study outcomes measured for graduates and demonstrates what can be expected from the tool. The trend in outcomes will vary across selected groups of graduates, and users can select a particular graduate group, analyse the trends in post-study outcomes and compare the outcomes across cohort of graduates. All underlying counts used in calculation of indicators for selected subgroups can also be downloaded.

We understand that the tool has some limitations. Some users may find they cannot define the subgroups of graduates the way they want, for example for specific provider or for specific age group. The tool is also limited in defining and measuring outcomes, because indicators are constructed using available administrative data. The aggregated descriptive summaries are limiting, as they only paint a descriptive picture of the outcomes for graduates as a group.

The data presented in the Graduate Outcomes Tool was developed by linking administrative information across government agencies. These data will not be always perfect. In some cases, information for one person may be incorrectly linked to information for a different

person, while in other cases information may be missing or incorrect. This may be of concern when such data are presented at a very detailed level.

In developing this tool, we have tried to avoid this by grouping the populations into sizeable groups. Because we are measuring the activity on a monthly basis, some smaller population subgroups may contain only a few individuals for whom outcomes or activity are measured. In these situations, usually the numerator of an indicator is suppressed. We deliberately attempted to minimise these cases.