Outcomes of tertiary education

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AN OVERVIEW

More New Zealanders have been participating in tertiary education in recent years and in 2005 there was a significant increase, from the previous year, in students completing a tertiary qualification. The overall rise was largely a result of an increase in the number of sub-degree qualifications awarded. There was also a significant increase in the number of students completing a postgraduate qualification, while the number of students completing bachelors degrees fell from the previous year.

One in two people in the New Zealand working-age population held a tertiary qualification in 2005. The group comprising all ‘other’ ethnicities had the highest proportion of its people with a bachelors degree or higher, followed by Europeans, Māori and Pasifika people.

The unemployment rate for holders of bachelors or higher qualifications and other tertiary qualifications fell in 2005 and these rates continued to be lower than for those with school qualifications or no qualifications. The unemployment rate also fell for those with school qualifications, while it remained unchanged in 2005 for those without any qualifications. A stronger economy has led to the lower rates of unemployment in recent years. New Zealand’s unemployment rates for the tertiary qualified are well below the average for the Organisation for Economic Co-operation and Development (OECD), according to the most recently available international comparisons.

International comparisons also showed that the New Zealand population’s overall tertiary attainment in 2004 was well above the OECD average for females and slightly below the average for males. The New Zealand population’s attainment of bachelors or higher qualifications was below the OECD average for both males and females, while the gender gap in New Zealand for tertiary qualifications, in favour of females, is now the second largest in the world, after Finland.

In 2006, the OECD calculated the internal rate of return to tertiary education for New Zealand for the first time. Rates of return were calculated for the individual (the private internal rate of return) and for the government (the public internal rate of return). The private tertiary return in 2003 was above the bond rate, meaning that even in a narrow financial sense, tertiary education is a good investment for a private individual. While the return to New Zealanders was higher than to the Danes and Swedes, it was below that of the Americans and the English.

The relatively low rate of return in New Zealand reflects the fact that there is less income disparity in New Zealand than in countries like the United States and the United Kingdom. The public return to tertiary education in New Zealand was again positive – it is financially a good investment for the government.

Another recent analysis looked at the earnings of students with loans who recently left study. This showed that those who completed a tertiary qualification had a higher median income, five years post-study, than those who did not complete their qualification. The income premium was higher for bachelors qualifications than for other tertiary-level qualifications. Analysis has also shown that the level and field of study and employment are factors influencing earnings.

The University of Auckland’s economic contribution to the Auckland region was estimated to be $4.4 billion in 2005 in a recent study. Similar studies in other regions have also shown that the presence of a major tertiary education provider carries a financial benefit for the community. Other recent studies on the outcomes of tertiary education showed that, on average, an additional year of education increases future income somewhere between 5 and 15 percent. Tertiary education also continues to contribute positively to New Zealand’s health, social and family outcomes. In addition to making workers more productive, it leads to the creation of knowledge, ideas and technological innovation. In the area of health, for example, studies show that those with post-school qualifications have lower mortality rates than those with no, or only school, qualifications.

LOOKING TO 2006

In 2006, the Ministry of Social Development released a report, called Living Standards 2004, which showed that comparatively high living standards are found among people with tertiary education. Using an Economic Living Standard Index, the report provided detailed information on the impact of tertiary education on the living standards of New Zealanders.

As the country moves towards a knowledge-based economy, it is interesting to speculate whether women’s higher educational attainment will result in more women being promoted to positions of leadership within both the public and private sectors. The emerging gender gap in educational attainment favouring females may portend closure of the gender wage gap and create a new economic paradigm, one that could bring in a
new social order. This portends higher earnings and higher status for women in the years to come, should a new social order be realised.

New Zealand’s tertiary education system adds social and economic welfare by promoting economic growth and reducing social inequality, and through the achievement of these goals, it enhances happiness and wellbeing. The prospect of better opportunities and a higher standard of living leads people to continue their education after attaining school qualifications. The long-term outcomes of tertiary education are explored in this chapter, using selected indicators that measure the progress towards desired outcomes. The indicators used here are New Zealand’s qualification completion rates, the qualifications of the population, the relationship between labour force status and education, the income benefits from education, the impact of education on participation in the community, and the impact of education on the population’s health. Some of the indicators are also used to compare New Zealand’s outcomes with those of other member countries of the Organisation for Economic Co-operation and Development.

RISING TREND IN TERTIARY EDUCATION QUALIFICATIONS

The number of New Zealanders completing a tertiary qualification increased by 10.9 percent from 2004 to 2005. There were 16 percent more students who attained a sub-degree qualification and 6.7 percent more students who completed a postgraduate qualification. However, the number of domestic students completing a bachelors degree in 2005 fell by 3.5 percent from 2004.

Over the period from 2000 to 2005, there was a 70 percent increase in the number of students who completed a tertiary education qualification. The overall rise was largely the result of an increase in sub-degree qualifications. Figure 4.1 shows that in 2000 there were 69,700 qualifications completed and in 2005 this had risen to 118,600 qualifications. Those completing a sub-degree qualification more than doubled over this period. Before the recent fall, completions of bachelors degree remained relatively steady from 2000 to 2005, while completions of postgraduate degrees rose by 17 percent over these years.

A major factor driving the increase in qualification completions is the higher participation by New Zealanders in tertiary education in recent years. A picture of the level of tertiary qualifications in the New Zealand working-age population can be seen in data from Statistics New Zealand’s Household Labour Force Survey. Of those in the working-age population (15 years or over), the proportion holding a tertiary qualification rose steadily from 1991 to 2005, from 39 to 50 percent. The increase from 2004 to 2005 was just above 1 percent.

The proportion of the New Zealand working-age population holding a bachelors or postgraduate qualification doubled from 7 to 15 percent between 1991 and 2005, while holders of other tertiary qualifications increased by only 3 percent. There was a significant drop, from 1991 to 2005, in the proportion of the population with no school qualification, while the proportion of school qualification holders remained relatively unchanged.
From 2004 to 2005, much of the growth in tertiary-level attainment in the working-age population was due to the growth in bachelors or higher qualifications. The proportion holding other tertiary qualifications remained unchanged from 2004 to 2005. Thirty-five percent of the population held other tertiary qualifications in 2005, while one-quarter held a school qualification and another quarter had no formal qualifications.

Ethnicity of holders of tertiary qualifications

Looking at the ethnic make-up of the population over the period from 1991 to 2005 shows that the proportion holding a bachelors or higher qualification increased by 14 percent for the Other ethnic group, by 7.5 percent for Europeans, by 4.8 percent for Māori and by 3.4 percent for Pasifika (Figure 4.3). A significant increase in the attainment rate of the Other ethnic group may be attributable to the fact that the proportion of the New Zealand usually resident population who were born overseas and also obtained their tertiary qualifications overseas is increasing over time. In an analysis of census data, Newell and Perry (2006) estimated that, in 1996, 20 percent of the usually resident population with bachelors or higher qualifications were born and educated overseas and in 2001 this had risen to 22 percent.

Qualification share by ethnic group

In terms of all qualification levels, the proportion of the European group and the Other ethnic group that held a tertiary qualification was 52 percent each in 2005. Thirty-six percent of Māori and 32 percent of Pasifika peoples held a tertiary qualification in 2005. In 2005, 30 percent of the Other ethnic group, 14 percent of Europeans, 5.8 percent of Māori and 4.5 percent of Pasifika peoples held a bachelors or higher qualification. Almost 40 percent of those in Māori and Pasifika groups did not have a formal qualification.

The bachelors or higher qualifications in the working-age population in 2005 increased on the previous year for the Other ethnic group by 1.9 percent, for Europeans by 1.4 percent and for Māori by 1.5 percent, while it fell for the Pasifika group by 0.9 percent. Due to the small size of the sample associated with the Māori and Pasifika ethnic groups at the bachelors or higher qualification level, caution needs to be exercised in drawing inferences about those sub-populations.

Figure 4.3: Working age population (June quarter) with a bachelors or higher qualification by ethnic group

Note: Due to larger sampling errors for the smaller ethnic groups such as Māori and Pasifika, caution needs to be exercised in interpreting the results for those groups.

While Figure 4.3 shows that significant disparity exists in New Zealand in the attainment of bachelors or higher tertiary qualifications by ethnic group, there is a positive trend in the attainment of other tertiary qualifications by Māori and Pasifika (Figure 4.4). Māori holders of other tertiary qualifications increased significantly, from 21 percent to 31 percent, between 1991 and 2005. However, from 2003, there was a slight drop in the proportion of Māori other tertiary qualification holders. Between 1991 and 2005, the percentage of Pasifika with other tertiary qualifications rose by 10 percentage points. Over the same period, Europeans registered only a small increase in other tertiary qualifications of four percentage points, while for the Other ethnic group the number holding other tertiary qualifications decreased by two percentage points.

In 2005, the proportion of the working-age population with other tertiary qualifications was 38 percent for Europeans, 31 percent for Māori, 26 percent for Pasifika peoples and 22 percent for the Other ethnic group.
Outcomes of tertiary education

The proportion of those aged 65 years or older with other tertiary qualifications increased steadily over the five years to 1996, then, following a flat period to 2002, it rose steadily to reach 30 percent in 2005. This is likely to be due to the increased participation of older people in tertiary education since 2000.

It is evident from Figure 4.6 that over the 14 years ending in 2005 there was a significant increase in the number of bachelors degree or postgraduate qualifications held by the population in the various age groups. This is especially apparent in the age groups of 25 to 39 years and 40 to 64 years. In 1991, 10 percent of 25 to 39 year olds had bachelors or postgraduate qualification and by 2005 this had risen to 25 percent. In the same period, this proportion increased from 6.8 to 16 percent for the 40 to 64 year olds. The proportion of 15 to 24 year olds with a bachelors or postgraduate degree increased from 3.6 percent in 1991 to 6.5 percent in 2005, while for those aged 65 or older the proportion increased from 3.1 to 5 percent.

Age of other tertiary qualification holders

Of those holding other tertiary qualifications, the majority in 2005 were aged 40 years or over. In 2005, 57 percent of all tertiary qualification holders in the working-age population were over 40 years of age, compared with 44 percent in 1991. This trend is partly a reflection of the increasing number of completions in other tertiary qualifications by those aged 40 to 64 years, between 1991 and 2005. The percentage of the population holding other tertiary qualifications in the age groups of 15 to 24 years has decreased slightly since 2002, while the proportion for those aged 25 to 39 years remained virtually unchanged, over the period from 1991 to 2005.
Rising female qualification attainment

Over the period from 1991 to 2005, the proportion of women attaining a tertiary qualification in the working-age population increased steadily, while among men the proportion showed little movement. Especially for bachelors or higher qualifications, the gender gap has closed significantly. It is interesting to note that the gender gap in the holders of school qualifications in favour of girls may appreciably influence the future post-school attainment rate. How this shift will be reflected in labour market outcomes in the coming years will be of considerable interest. Will attitudes about women’s role in society evolve in a manner that is compatible with the educational edge that women may soon gain over men? Or will new barriers spring up that prevent women from securing an equal footing with men in top management positions? 1 This portends higher earnings and higher status for women in the years to come.

The graph below shows that the number of women holding a tertiary qualification increased from 34 percent in 1991 to 59 percent in 2005.

Figure 4.7: Working-age population (June quarter) with a tertiary qualification by gender

The gender gap is also narrowing, but more slowly, for other tertiary qualifications. Figure 4.8 illustrates that the proportion of males with other tertiary qualifications remained unchanged at 38 percent from 1991 to 2005, while the proportion of females with other tertiary qualifications increased from 27 percent to 32 percent over the same period.

The estimates from the 2005 Household Labour Force Survey of the number of men and women by highest level of qualification are shown in Figure 4.9. Among the female population, about 27 percent held a school qualification and a similar proportion had no formal qualification.

Figure 4.8: Working-age population (June quarter) by qualification level and gender

Management and commerce most common field of study

In a recent analysis of the 2001 census data, Newell and Perry (2006) indicated that a large proportion of people hold qualifications in management and commerce (17 percent), followed by engineering and related studies (17 percent) and society and culture (15 percent). The least common field considered was information technology (Figure 4.10).

Figure 4.9: Working-age population by qualification level and gender

1 U.S. News & World Report reporter Brendan I. Koerner speculates, “If college degrees remain an entry to wealth and status in the 21st century, males may have to get used to the same second-class status that women so long endured, as highly educated females become the majority among the nation’s intellectual, economic, and even power elite.”
The most common field of study varied by level of the study. At bachelors degree and postgraduate level the most common field was society and culture (29 percent), followed, at some distance, by management and commerce (19 percent) and natural and physical sciences (14 percent). The most common field of study for sub-degree qualifications was engineering and related studies (23 percent), followed by management and commerce (16 percent) and health studies (15 percent). The least common field of study for bachelors degrees was food and hospitality while for other tertiary qualifications natural and physical sciences were least common. There was a significant shift in the choice of fields of study observed between 1981 and 2001. This shift in the field of study preference was largely driven by labour market demand.

International comparisons indicate that at 36 percent attainment of tertiary qualifications by New Zealanders is slightly higher than the OECD average. This proportion is comparable to those of Australia and Finland. The proportion of the New Zealand population with a bachelors or higher qualification is 18 percent,2 slightly lower than the OECD average. In Finland, this rate is 18 percent and in Australia it is 22 percent. This level of attainment is observed in countries like the United States, Canada, New Zealand, Australia and Finland where programmes of three to five years are the norm. Sub-degree programmes are a sizeable feature of the tertiary education system in some OECD countries, including New Zealand (Figure 4.11).

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2 This percentage is higher than that from the Household Labour Force Survey because it is based on a slightly different age group.
Figure 4.11: Proportion of population aged 25 to 64 years in 2004 by qualification level and country


Note: Diploma in this graph refers to certificates and diplomas at level 5 to 7 and Certificate refers to level 1 to 4 certificates. Finland does not have qualifications equivalent to level 1 to 4 certificates.

Another indicator of tertiary education outcomes is the graduation rate. This is charted below for selected OECD countries. The graduation rate for 2004 is the proportion of students that have completed tertiary qualifications, expressed as a percentage of the age group normally completing these qualifications.

Figure 4.12: Tertiary graduation rate in 2004 by qualification level and country


Note: Tertiary-type B and tertiary-type A programmes correspond to level 5 to 7 certificates and bachelors or higher qualifications, respectively. Advanced research programmes refer to doctoral study in New Zealand. The duration of programmes leading to a first tertiary-type A qualification ranges from three to five years.

Although not all of those completing are in the 'normally completing' age band, this figure gives an indication of how many students are obtaining a higher-level tertiary qualification.

At over 40 percent, the graduation rate for tertiary-type A qualifications in New Zealand is one of the highest among OECD countries. This compares with the OECD average of 35 percent. New Zealand's graduation rate is comparable to those in Finland and Australia. Graduation rates at degree level are at 40 percent or more in Australia, New Zealand and the United Kingdom, where bachelors level programmes of three to five years are the norm.

At 21 percent, New Zealand's diploma-level graduation rate in 2004 was also higher than the OECD average of 9 percent. Japan has the highest graduation rate at diploma level, followed by New Zealand. Programmes of this type are a sizeable feature of the tertiary system in only a small number of OECD countries, most notably Japan and New Zealand. The graduation rate in New Zealand for advanced research programmes is slightly lower than the OECD average of 1.3 percent.

Tertiary-level qualification attainment of the population by age group, for selected OECD countries, is shown in Figure 4.13. New Zealand's attainment is higher than the OECD average for those aged 45 to 54 years and 55 to 64 years, at 26 and 20 percent, respectively. This compares to the OECD averages of 23 and 18 percent. However, in the younger age groups, the proportion of the population with a tertiary qualification is lower than the OECD average. New Zealand's attainment was 28 percent for those aged 25 to 34 years and 26 percent for the group aged 35 to 44 years. The OECD averages were 31 and 27 percent, respectively.

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3 This measure excludes certificate levels 1 to 3, which are considered by the OECD to be post-secondary, non-tertiary qualifications.
Outcomes of tertiary education

Figure 4.13: Proportion of population with a tertiary qualification in 2004 by age group and country


Note: This graph excludes post-secondary non-tertiary qualifications which refer to level 1 to 4 certificates.

Tertiary qualification attainment by gender, for selected OECD countries, is charted in Figure 4.14. New Zealand had a higher tertiary qualification attainment rate in 2004 for females than males, at 38 and 32 percent, respectively. This compares with an OECD average of 33 percent for females and 34 percent for males. Male and female attainment rates of bachelors or higher qualifications in New Zealand are below the OECD average.

Figure 4.14: Proportion of the population with a tertiary qualification in 2004 by gender and country


Note: Diploma in this graph refers to level 5 to 7 certificates and diplomas and Certificate refers to level 1 to 4 certificates. Finland does not have qualifications equivalent to level 1 to 4 certificates.

On the other hand, female attainment at post-secondary and diploma level was higher in New Zealand compared with the OECD average.

Compared with other OECD countries, the gender gap is largest in Finland, followed by New Zealand, where the female graduation rate exceeds that of males by more than 6 percent.
Another indicator used by the OECD for comparing tertiary outcomes is the survival rate. The survival rate is defined as the proportion of students who successfully complete the study undertaken within the normal minimum time for the qualification. The highest degree-level survival rates are reported by Japan, at over 80 percent, while in New Zealand and the United States the survival rates are just over 50 percent. The survival rates for degree-level programmes in New Zealand, Sweden and the United States are below the OECD average. This is due to a high proportion of part-time students in the student population in New Zealand and low barriers of entry to study. The survival rates in the advanced research programmes in New Zealand are comparable to the OECD average of 67 percent. New Zealand’s diploma survival rate was 42 percent and this was one of the lowest compared to the OECD average of 62 percent (Figure 4.15).

Figure 4.15: Survival rate in tertiary education in 2004 by country

Notes:
1. Tertiary-type B and tertiary-type A programmes correspond to level 5 to 7 certificates and bachelors or higher qualifications, respectively. Advanced research programmes refer to doctoral study in New Zealand. The duration of programmes leading to a first tertiary-type A qualification ranges from three to five years.
2. The diploma figure for Australia is stated as missing.
Qualification levels in industry and occupation groups

The distribution of tertiary qualification holders employed in different industries is depicted in Figure 4.16. Almost 45 percent of the bachelors or higher qualification holders are employed in education, followed by business and financial services. The smallest proportion of bachelors or higher qualification holders is employed in the construction industry.

Among the holders of other tertiary qualifications, the most common industries of employment were the construction industry and health and community services, at 54 percent and 45 percent, respectively (Figure 4.16).

Figure 4.16: Distribution of employees with a tertiary qualification by industry


Figure 4.17: Distribution of employees by qualification level and broad occupational group

The distribution of tertiary qualification holders by broad occupational group shows that bachelors and higher qualifications are closely associated with professional occupations, legislators, administrators and managers as well as technicians and associate professionals. On the other hand, other tertiary qualification holders are generally employed as trades workers, technicians and associate professionals, agriculture and fishery workers, or clerks, sales and services workers.

LABOUR MARKET OUTCOMES

Participation in the New Zealand labour force by men and women with tertiary qualifications is graphed in Figure 4.18. A significant shift can be observed, between 1991 and 2005, in the participation in the labour market of females with a bachelors or higher qualification. From 1991 to 2005, the participation rate for the male population with a bachelors or higher qualification rose by 5 percent while the female participation rate increased by 15 percent. Consequently, the gender gap (in favour of males) in the participation rate for those with bachelors or higher qualifications decreased from 17 percentage points in favour of males in 1991 to seven percentage points in 2005. A significant upwards shift in the female participation rate from 2000 onwards can be observed in the graph below. The labour force participation rate for those holding other tertiary qualifications remained relatively unchanged over the period from 1991 to 2005, especially for males. Over the same period, a small increase can be observed in the participation rate of females with other tertiary qualifications.

The 2005 labour force participation rates for men and women by qualification level are depicted in Figure 4.19. The gap between the participation rate of men and women narrows as the qualification level rises. For those with no qualification, the gap was 21 percentage points. Among those with a bachelors or higher qualification the gap was seven percentage points.

Ethnicity and the labour force participation rates in 2005 are charted in Figure 4.20. Among all ethnic groups higher tertiary-level qualifications were associated with higher participation rates. The European, Māori and Pasifika groups with tertiary qualifications generally have relatively similar labour force participation rates while the Other ethnic group had a lower labour force participation rate at all levels of highest qualification.

Note: Due to larger sampling errors for the smaller ethnic groups such as Māori and Pasifika, caution needs to be exercised in interpreting the results for those groups.
Outcomes of tertiary education

Of those with a bachelors or higher qualification in 2005, Māori had the highest labour force participation rate, 92 percent, followed by Europeans at 86 percent and Pasifika at 84 percent. Those in the Other ethnic group had the lowest participation rate at 75 percent. The labour force participation rates of those with other tertiary qualifications was 77 percent for Europeans, 75 percent for Pasifika, 74 percent for Māori, and 67 percent for the Other ethnic group.

Unemployment and the tertiary qualified
The unemployment rate has decreased across all qualification levels since 1998, due to a strong New Zealand economy. In 2005, New Zealand had the second lowest unemployment rate among OECD nations at 3.6 percent, just above South Korea. The average rate for the whole OECD in 2005 was 6.3 percent. Figure 4.21 also illustrates how the unemployment rate has varied with the change in economic cycle with unemployment falling from 1998 onwards in response to the strengthening of the economy. The unemployment rate has fluctuated for all groups; however, the smallest fluctuations have been among those with tertiary qualifications. The unemployment rate among those with bachelors or higher qualifications fluctuated between 5 percent in 1997 and 2 percent in 2005. By contrast, the unemployment rate of those with no qualifications was nearly 16 percent in 1993 and fell to 6.4 percent in 2005. This implies that having a tertiary qualification is associated with greater sustainability of employment.

Another interesting observation is that the unemployment rates for those with other tertiary qualifications and those without school qualifications has narrowed considerably. By 2005, there was no difference in the unemployment rate for holders of bachelors or higher qualifications and those with other tertiary qualifications.

Unemployment and ethnicity
Between 1991 and 2005, the disparity in the unemployment rates of different ethnic groups with a tertiary qualification narrowed. In recent years, the closing of this gap has been more pronounced, especially for those with bachelors or higher qualifications. Of those with a bachelors or higher qualification, the unemployment rate fell for Europeans from 3.6 to 1.1 percent; for Māori from 4.9 to 1.7 percent; for Pasifika from 9.9 to 1.6 percent – the most significant improvement; and for the Other ethnic group the rate fell from 11.6 to 6.5 percent. While the drop in unemployment for the Other ethnic group was five percentage points from 1991 to 2005, it nonetheless remains five percentage points higher than for the other groups. The overall trend in the unemployment rate for those holding a bachelors or higher qualification is shown as a line in the graph below (Figure 4.22). The fluctuating movements in the unemployment rate coincide closely with the economy’s business cycle.
Figure 4.22: Unemployment rate (June quarter) of the working-age population with a bachelors or higher qualification by ethnic group


Note: Due to larger sampling errors for the smaller ethnic groups such as Māori and Pasifika, caution needs to be exercised in interpreting the results for those groups.

Of those with other tertiary qualifications, the gap in the unemployment rate for the Other ethnic group has also gradually become smaller, from 13 percent in 1991 to 4.3 percent in 2005. Over the same period, the unemployment rate for Europeans dropped from 6.2 to 2 percent, for Māori from 19 to 6 percent and for the Pasifika group from 21 to 3.7 percent.

The lower unemployment rate associated with holders of higher-level qualifications highlights the importance of tertiary qualifications in the labour market. Strong economic growth and higher attainment rates have both contributed significantly to lower unemployment rates in recent years. A detailed discussion on labour force participation by educational qualification can be found in a recent report by Smart (2006).

Marginal gender disparity in unemployment rates

The unemployment rates for men and women with bachelors or higher qualifications show only a marginal disparity in 2005, when compared with other tertiary qualification holders. The unemployment rate in 2005 for females with bachelors or higher qualifications was 2.5 percent, while for males this was slightly higher at 2.8 percent. For males with other tertiary qualifications the unemployment rate was 2.3 percent, while females with other tertiary qualifications had a higher unemployment rate of 3.2 percent. The gender disparity in unemployment is more evident among those with no school qualifications.

How does New Zealand’s unemployment compare internationally?

In this section, we compare the employment rate at various qualification levels in OECD countries. The employment rate referred to here is calculated as the number employed as a percentage of the population of working age, those aged 25 to 64 years. The employment rates for both males and females with tertiary qualifications for selected OECD countries are graphed below (Figure 4.23).

The employment rate for the New Zealand population aged 25 to 64 years was 84 percent in 2004. This compares to an OECD average of 84 percent and 83 percent in Australia.

Male employment rates in New Zealand are very similar for those with bachelors or higher qualifications, diplomas and level 1 to 4 certificates. In 2004, these rates were 90 percent, 91 percent and 89 percent, respectively. These are well above the OECD average. For females in New Zealand, these rates in 2004 were 80 percent, 78 percent and 76 percent, respectively, and this is slightly lower than the equivalent OECD averages. The male employment rate is 11 to 14 percentage points higher than for females.
Outcomes of tertiary education

In New Zealand across all tertiary qualifications. The OECD average male employment rate is 10 to 11 percentage points higher than that of females. This indicates that bachelors and higher qualifications have reduced the gender disparity in the employment rate; however, the gender gap in New Zealand is higher than the OECD average.

In 2004, New Zealand’s unemployment rate for the population aged 25 to 64 years was 2.4 percent for both the holders of bachelors or higher qualifications and those with other tertiary qualifications. This differs slightly from that published in the Household Labour Force Survey, which is based on a working-age population aged 15 or over. This is one of the lowest rates for OECD countries. The OECD average for those with bachelors or higher qualifications was 3.9 percent, and 6.2 percent for holders of other tertiary qualifications – a gap of 2.3 percentage points.

Differences in the unemployment rate, due to qualification level and gender, are depicted for selected OECD countries in Figure 4.24. Although there were differences in the unemployment rate between males and females in 2004, the gap for those with higher qualifications was closer in New Zealand than in other countries in the OECD. The respective unemployment rates for males and females were 2.5 percent and 2.8 percent for those with bachelors or higher qualifications; 1.1 percent and 2.2 percent for those with diplomas; and 2.5 percent and 3.5 percent for those with post-secondary qualifications. The respective average unemployment rates for OECD countries were 3.5 percent and 4.3 percent for holders of bachelors or higher qualifications; 3.8 percent and 4.3 percent for diploma holders; and 4.4 percent and 6.6 percent for those with post-secondary qualifications.

Figure 4.23: Employment rate in 2004 for those aged 25 to 64 years by qualification level, gender and country

Note: Diploma in this graph refers to level 5 to 7 certificates and diplomas and Certificate refers to level 1 to 4 certificates. Finland does not have qualifications equivalent to level 1 to 4 certificates.
Figure 4.24: Unemployment rate in 2004 for those aged 25 to 64 years by qualification level, gender and country


Note: Diploma in this graph refers to level 5 to 7 certificates and diplomas and Certificate refers to level 1 to 4 certificates. Finland does not have qualifications equivalent to level 1 to 4 certificates.

TERTIARY QUALIFICATIONS AND INCOME

Between 1997 and 2005, information from the New Zealand Income Survey showed that people holding bachelors or higher qualifications earned more than those with other tertiary qualifications (Figure 4.25). The median weekly incomes for the population aged 15 or over by highest educational qualification are shown in Figure 4.25. Over the period from 1997 to 2005, the income differential between holders of bachelors and higher qualifications and those holding other tertiary qualifications remained virtually unchanged. The former earned a median weekly income of $756 and the latter earned $560 in 2005. The relative difference in earnings between the tertiary qualified and those with no qualifications decreased between 1997 and 2005 – a consequence of the strengthening labour market, with a consequent fall in unemployment. The incomes of those with bachelors and higher qualifications rose by less than 2.6 percent per year from 1997 to 2005, while the incomes for those with other tertiary qualifications rose by 3.5 percent per year. The incomes of those with no school qualifications also increased by 3.6 percent per year from 1997 to 2005.

Figure 4.25: Median weekly income (June quarter) from all sources for the working-age population by qualification level

Source: Statistics New Zealand (2005), New Zealand Income Survey.

The New Zealand Income Survey collects information on both hourly and weekly earnings. These two measures give different views of the extent to which the labour market is rewarding people in employment. Weekly earnings give a sense of people’s access to work, as well as the level of payment that work commands. Hourly earnings record the latter without distorting the effects of the number of hours worked. This shows...
that people with higher qualifications have higher median hourly wage rates. In 2005, males with bachelors and higher qualifications earned a median hourly wage of $25, compared to a rate of $19 for those with other tertiary qualifications. The comparable rates for females were $20 and $16, respectively (Figure 4.26).

Disparities in earnings between men and women are clearly evident at all qualification levels. In 2005, the largest gender differential was observed for the Other ethnic group. Of those with bachelors or higher qualifications, males in the Other ethnic group earned 82 percent more, on average, than females. Europeans in the same qualifications group had the next highest gender differential, with males earning 47 percent more, on average, than females. Māori followed, with males earning 31 percent more, on average, than females. Gender disparity was greatest for Europeans, in the case of those with other tertiary qualifications, with males earning 71 percent more, on average, than females. The next highest gender differential in this qualification group was observed for the Other ethnic group – males earned 53 percent more, on average, than their female counterparts. Māori males followed, earning 50 percent more than Māori females and in the Pasifika group, males earned 38 percent more, on average, than females.

The ethnic-based disparity in hourly wage rates is much smaller for those with no qualifications or school qualifications only. As can be seen in Figure 4.27 the differences in hourly rates by ethnic group are most apparent for those with bachelors or higher qualifications.

The disparity among people of different ethnic groups in earnings is lower among those who hold a tertiary qualification. In 2005, the earning differential between holders of bachelors or higher qualifications varied considerably among ethnic groups. Māori with bachelors or higher qualifications in 2005 had the highest median weekly earnings, at $902, followed by Europeans at $806, then Pasifika at $690 and the Other ethnic group at $500. The other tertiary-qualified groups earned significantly less in 2005 than those with bachelors or higher qualifications.

The median hourly wage rate increases substantially for holders of bachelors or higher qualifications for the various age groups. For those aged 40 to 64 years the increase is very significant for holders of bachelors or higher qualifications while for the less qualified the increase is minor (Figure 4.28).

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4 The analysis of the impact of highest qualification on the median weekly income has the advantage of not disaggregating the impact of hours worked on weekly income.

5 Due to the large sampling error for the Pasifika group, caution needs to be exercised in interpreting the result for this group.

6 Median earnings may not reflect the real situation. Although the Māori population may have higher earnings than Europeans, their proportions of population distributed in higher income ranges are very small.
Income premiums for those with tertiary qualifications

A recent analysis of the earnings of students with loans who recently left study between 1997 and 1999 showed that successful completion of a tertiary-level qualification results in higher median incomes five years post-study (Hyatt and Smyth 2006). For those who successfully completed a bachelor’s-level qualification the premium was 30 percent more than for those who studied at that level but left without completing a degree (Figure 4.29). Over time, the premium on the successful completion of higher-level qualifications either stays the same or it increases, while the premium on the successful completion of sub-degree qualifications exhibits a drop in the premium.

The premium for completing a bachelor’s degree was higher than for a masters degree. The premium for completing a diploma was also higher than for a level 1 to 3 certificate. Over time, the premium was higher for bachelors and higher qualifications than for other tertiary qualifications. While the premium levels earned reflect the value of skills acquired during study they were also influenced by the lower unemployment rate between 2000 and 2002 which had the effect of lowering the premium.

The premium for holders of a bachelor’s or higher qualification was higher for men than for women, while for those completing other tertiary qualifications the premium was higher for women than for men.

The ethnic differences in earnings for those who completed a qualification and those who did not are graphed in Figure 4.30. As can be seen from the graph, Asians had the highest earnings premium, three and five years after leaving study, and Māori had the highest earning premium, seven years after leaving study.
Factors influencing post-study incomes

A recent study by Nair (2006) assessed the influence of qualifications, demographics and employment-related factors on post-study incomes. The analysis looked at the earnings of Student Loan Scheme borrowers who had left tertiary study between 1997 and 1999. The industry of employment, combined with the level of tertiary qualifications and the field of study, was an important factor in determining post-study income. The study also confirmed the fact that those with higher-level qualifications receive higher earnings. For example, it was found that student loan borrowers with a doctorate qualification earned a premium of 178 percent, which was higher than that of level 1 to 3 certificate holders when other factors such as age, gender, etc. were held constant. Borrowers with a masters degree earned a premium of 157 percent and those with bachelors degrees or advanced diplomas earned a premium of 63 percent.

The premiums earned by holders of higher-level qualifications compared to the earnings of those with level 1 to 3 certificates are graphed in Figure 4.31. The premiums shown are expressed as a ratio of the predicted earnings of borrowers at each qualification level to the predicted earnings of borrowers with a level 1 to 3 certificate.

People who study in the field of health studies were found to have the highest predicted earnings. These borrowers, once other factors such as age were controlled for, had predicted earnings over twice as high as someone who had studied a mixed field programme. The next highest predicted premium was earned by those who studied in the fields of engineering and management and commerce. Borrowers who studied mixed field programmes had the lowest predicted earnings. The predicted premiums earned in the various fields of study compared with the predicted earnings of those who qualified in a mixed field programme are shown in Figure 4.32.

Figure 4.31: Predicted income premium for higher qualifications relative to certificate levels 1-3

Source: Statistics New Zealand, Integrated Dataset on Student Loan Scheme Borrowers.

7 It is important to note that the premium on income across the various fields of study (and industries) can vary widely at different levels of tertiary qualification. The reader should refer to Nair’s full report for a presentation of more in-depth findings of these ‘interaction effects’.
Industry of employment was found to be the major factor determining the level of post-study income (Figure 4.33). The study found that those with a tertiary qualification employed in the electricity, gas and water supply industry had the highest predicted earnings, once other factors were controlled for. Employees in this field received a predicted income premium of over 200 percent compared with those employed in the accommodation industry. The premiums earned by those employed in the electricity, gas and water supply industry and in mining may be attributable in part to the high risk associated with their work.
Labour market outcomes 5 to 10 years after graduation

Income premiums are also paid to those in fields of employment that require a matching field of study that has a high degree of specialisation such as beauty services and hairdressing, medicine, nursing and teacher education. Maré and Liang (2006) referred to this type of industry as ‘in-field’ employment. Fields of study with low degrees of specialisation included business and management, office studies, and sales and marketing. Their study focused on post-school graduates aged 18 to 30 years and used information from the New Zealand population census (Figure 4.34). Maré and Liang’s specialisation index showed large increases in the incomes of graduates from 1996 and 2001.

The study found that for tertiary graduates aged between 18 and 65, the median income of those employed ‘in-field’ was 11 percent higher than those employed ‘out-of-field’. The premium for those graduates aged between 18 and 30 was higher at 20 percent, suggesting that as graduates get older the premium for working ‘in-field’ falls.

However, Maré and Liang found considerable variation exists in the premium for working ‘in-field’ across fields of study. For those aged 18 to 65, 16 out of 26 fields of study had a higher median income for those who were employed ‘in-field’ than those employed ‘out-of-field’. Fields of study that showed significant positive returns to working ‘in-field’ were medicine with a premium of 141 percent, computer and information science (79 percent) and business and management (51 percent). This compares with fields of study such as building and automotive engineering that displayed negative returns from working ‘in-field’ of 16 percent and 12 percent, respectively.
For graduates aged between 18 and 30, 20 out of 26 fields of study displayed a higher median income for those who were employed ‘in-field’ than those who were employed ‘out-of-field’. ‘Medicine’ and ‘computer and information science’ once again displayed strong positive returns to working ‘in-field’ of 125 percent and 84 percent, respectively. Of fields of study that had negative returns from working ‘in-field’, ‘creative arts’ was the most significant with a median income 13 percent lower for those who were employed ‘in-field’ than for those employed ‘out-of-field’.

**Income returns to tertiary education – how we compare internationally**

An income index for males and females of selected OECD countries is drawn in Figure 4.36 below. The index compares those with lower level tertiary qualifications, tertiary diplomas and bachelors or higher qualifications with those who have upper secondary and post-secondary non-tertiary education. The average earnings of this group have been scaled to 100 in the graph. This illustrates that those with a higher qualification level earned a relatively higher income premium. The relative average earnings in New Zealand in 2004 were slightly below those of the United States, Germany and the United Kingdom for those with certificate and diploma qualifications. Comparing the returns in 2004 with those with a higher-level qualification shows that the returns are greater in countries such as the United Kingdom and the United States. The relative earnings score was 174 in the United Kingdom and 181 in the United States, while New Zealand’s score was 147.

![Figure 4.35: Median annual income in 2001 for tertiary graduates aged 18 to 30 years by in-field and out-of-field employment](source: Ma, E. Z. and Liang, Y. (2006), Labour market outcomes for young graduates)
Outcomes of tertiary education

### Figure 4.36: Relative earnings in 2004 of those aged 25 to 64 years by qualification level, gender and country

<table>
<thead>
<tr>
<th>Qualification Level</th>
<th>New Zealand</th>
<th>Germany</th>
<th>United Kingdom</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor's degree or higher</td>
<td>100</td>
<td>120</td>
<td>150</td>
<td>180</td>
</tr>
<tr>
<td>Diploma</td>
<td>80</td>
<td>100</td>
<td>120</td>
<td>150</td>
</tr>
<tr>
<td>Certificate</td>
<td>60</td>
<td>80</td>
<td>100</td>
<td>130</td>
</tr>
</tbody>
</table>

**Notes:**
1. Diploma in this graph refers to level 5 to 7 certificates and diplomas and Certificate refers to level 1 to 4 certificates.
2. Post-secondary (certificate equivalent) is stated as missing for the United Kingdom.

The 2004 income distribution for the population aged 25 to 64 years by qualification level is shown in Figure 4.37 for selected OECD countries. Twenty-two percent of New Zealanders with bachelor's or higher qualifications have a pre-tax income of twice the median income or higher. This compares to 29 percent and 30 percent in the United Kingdom and the United States, respectively. Nine percent of New Zealanders with a tertiary diploma qualification have a pre-tax income of twice the median income or higher. This compares to 12 percent in the United Kingdom and the United States.8

Comparisons can also be observed about the proportion below the median income in different countries. In New Zealand, in 2004, 11 percent of those with a bachelor's or higher qualification earned 50 percent less than the median income. In the case of the United Kingdom and the United States, these percentages were six and 12, respectively. Twenty percent of New Zealanders with a diploma qualification are likely to earn half the median income or less. It is interesting to note that even at higher levels of education there is a small number of individuals in the lower earning categories, suggesting that their return on tertiary education has been relatively low.9 Graph 4.37 shows that New Zealand has relatively low income disparities when compared with the United States and the United Kingdom.

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8 The earnings distributions also reflect the fact that educational attainment cannot be fully equated with proficiency and skills: skills other than those indicated by educational attainment, as well as experience, are rewarded in the labour market. Differences in the scale and operation of training systems for adult learners also influence national patterns of earnings dispersion, as do non-skills-related recruitment considerations—such as gender, ethnicity or age. Technological, economic and social change could all alter how wage levels relate to the level of educational attainment.

9 The data shows that in most countries the share of individuals in the lowest earnings categories falls as the level of educational attainment rises. This result is another way of viewing the well-established, positive relationship between earnings and educational attainment. The data reported are accounting rates of return only. The results would no doubt differ from econometric estimates that control for the inherent ability, and other features, of those who decide to invest in education.
The OECD calculates New Zealand’s internal rates of return

The impact on earnings of investing in tertiary education can also be measured by calculating the internal rate of return on the investment. The internal rate of return takes account of both the costs of getting a qualification in terms of fees and study costs, and also income foregone and income gained. The OECD recently published the 2003 internal rates of return for individuals (the private rate of return) and the return for governments (the public rate of return). Two scenarios apply:

- The individual follows a tertiary education programme directly from school before entry to the labour market.
- Attainment of the next higher level of education has been postponed until the age of 40.

The private internal rate of return for the two scenarios has been graphed for selected OECD countries in Figure 4.38. For those with bachelors degrees in 2003, the private internal rate of return in all OECD countries except New Zealand, Denmark, Sweden and Switzerland was above 10 percent per annum for both men and women. In New Zealand, the private rate is well below those of the United States and the United Kingdom, while it is higher than the rates in Sweden and Denmark.

New Zealand’s lower private internal rate of return reflects the relatively low income disparity and the low unemployment rate in 2003. The internal rate of return for those going straight to tertiary education was 12 percent in 2003 for females, compared to a rate of 9.3 percent for males.

The private internal rate of return was substantially lower for those who attained a tertiary qualification at age 40. This rate was 6.5 percent for males and 7.5 percent for females. The private internal rates of return were higher for this group in all other OECD countries than in New Zealand, Denmark and the United States. While the impact on earnings for individuals who invest mid-career is likely to be more modest, the overall result is that there is still a positive return on investment in tertiary education for individuals. The estimates graphed below are, however, based on average pre-tax earnings for persons at different levels of educational attainment. At a given level of educational attainment, individuals who have chosen different courses of study or who come from different social groups may register different rates of return. In estimating benefits, the effect of education on increasing the likelihood of employment is taken into account. This does, however, make the estimates sensitive to the stage in the economic cycle when the data was collected.
Outcomes of tertiary education

Figure 4.38: Private internal rate of return in 2003 for a bachelors degree by gender and country


The public internal rates of return for New Zealand and selected OECD countries is charted in Figure 4.39. The public internal rate of return attempts to get a measure of the cost to the taxpayer of funding an individual’s education and balances that against the extra tax that is collected as a result of the fact that graduates earn more. New Zealand’s public return for both males and females is 9.9 percent, lower than the rate in the United Kingdom and the United States while above the rate in Sweden, Denmark and Switzerland. For those who enter tertiary education programmes directly after education, the public rate is higher in New Zealand, Belgium and Korea than the private rate. Nevertheless, these public rates of return are still high and well above, for example, the interest rate offered in some countries on long-term government bonds.

For those individuals who return to tertiary education mid-career, and absorb the direct costs of tuition and foregone earnings, the public rate of return for completing a bachelors degree was lower in 2003 than the private return in all countries. There were particularly low rates of return in Denmark, New Zealand, Sweden and Switzerland. These low rates are driven by factors such as the high costs of providing education, and high losses in tax receipts from foregone earnings relative to tax revenues when the individual returns to work.

Figure 4.39: Public internal rate of return in 2003 for a bachelors degree by gender and country


The overall positive result is that for those who acquire tertiary education, the high private internal rates of return in most countries indicate that investment in human capital appears to be an effective way for individuals to build wealth.

TERTIARY EDUCATION AND ECONOMIC GROWTH

Studies typically find that, on average, an additional year of education increases an individual’s future earnings by between 5 percent and 15 percent, depending on when study takes place and in which country (Temple 2001). A recent study by Mitch (2005) on education and economic growth used the assumption of an earnings increase of between 5 percent and 15 percent for each extra year of study. This study reported that an average 16 years of education would result in a one- to four-fold increase in per capita income relative to school-level earnings. In this scenario, it was assumed that the physical capital stock was constant. Where the physical capital stock was allowed steady-state change, this resulted in a one- to eight-fold increase in per capita income. The varying returns on the per capita income from an extra year of education are graphed in Figure 4.40.
A New Zealand study argues that the effect on earnings of an additional year of education is probably around 6 to 8 percent (Norton, Sanderson, Booth and Stroombergen 2000). Assuming that the increase in earnings is around 6 to 8 percent, the increase in per capita income under New Zealand conditions would result in an up to four-fold increase, attributable to additional education, allowing for steady-state change in the physical capital stock. Schleicher’s study (2006) reports that the OECD countries that give individuals one more year of education will boost productivity and economic output over time by between 3 percent and 5 percent.

Studies of census and Household Labour Force Survey data show positive returns to tertiary education. Studies by Maani (1996, 1999), Maani and Maloney (2004) and Penny (2005), all showed that there were positive returns associated with higher qualifications. Similarly, Scobie, Gibson and Trenh (2005) estimated the value of human capital and found that qualification levels were a major factor in determining an individual’s human capital. Those with higher qualifications had a significantly higher estimated human capital than those without these qualifications.

The tertiary education system also contributes to the economic growth of New Zealand in many other ways. A recent study by Walton (2006) on the operational activities of tertiary education institutions showed that they direct substantial money flows into the New Zealand economy. It was estimated, for instance, that the expenditure of the University of Auckland, and its students, added $4.4 billion of output to the Auckland regional economy in 2005.

The number of foreign students in New Zealand decreased in 2005 and Education New Zealand, an association of education exporters, reported that there were 5.7 percent fewer foreign full-time equivalent students in the tertiary education sector in 2005, compared to 2004. Income for the industry had dropped from $1.47 billion in 2004 to $1.39 billion in 2005, a decrease of 5.4 percent. The fall in spending by international students will also reduce income available to the New Zealand economy. In 1997, the earnings from international students was $0.2 billion.

**HEALTH, SOCIAL AND FAMILY OUTCOMES**

The benefits of tertiary education also include positive returns to society that cannot be estimated because the tax and expenditure data on such indirect effects of education is not readily available. For example, better-educated individuals generally experience superior health status, lowering the expenditure on the provision of their health care. Another example suggests that, for some individuals, achieving higher levels of education lowers the likelihood of their committing certain types of crime.

McMahon reports in a United States study, published in 2002, that the social benefits of education include not only direct effects such as a higher labour force participation rate and increased economic productivity, but also the impact on the population’s growth rates and health, democratisation, political stability and human rights. Additionally, the study reports on the impacts of education on the environment and how it helps to reduce poverty, inequality, crime and drug use.

Many studies, both internationally and in New Zealand, show that education has become one of the most widely used socioeconomic indicators, used for mortality and health studies in the areas of demography and epidemiology. For example, a census mortality study conducted by the University of Otago and the Ministry of Health estimated inequalities and trends in adult mortality by income, education and occupational class. This study presents results for four different time periods and focuses on the differences in mortality for three levels.
Outcomes of tertiary education

The study covered the New Zealand resident population aged 25 to 77 years. The results showed that within each cohort, those with post-school qualifications have lower mortality rates than those with no qualifications or school qualifications only. The mortality rates for men are depicted in Figure 4.41 and those for women in Figure 4.42.

Figure 4.41: New Zealand male mortality rate by highest qualification level for four census cohorts

Notes:
1. Mortality rate per 100,000 population.
2. New Zealand resident population aged 25 to 77 years on census night.
3. The cohorts were followed for three years.
4. All-cause mortality – cause of mortality as classified under ICD9 classification.

Figure 4.42: New Zealand female mortality rate by highest qualification level for four census cohorts

Notes:
1. Mortality rate per 100,000 population.
2. New Zealand resident population aged 25 to 77 years on census night.
3. The cohorts were followed for three years.
4. All-cause mortality – cause of mortality as classified under ICD9 classification.

Another United States study, by Lochner and Moretti (2001), estimates the effect of education on participation in criminal activity, and the effects of education. Crime is a negative externality with enormous social costs, so if education reduces crime, then education may have large social benefits that are not taken into account by individuals. The paper begins by analysing the effect of education on incarceration using United States census data and changes in state compulsory attendance laws over time. They estimated that additional years of secondary education reduce the probability of incarceration, with the greatest impact associated with completing high school.

Another study, by Dee (2004), on the effects of educational attainment on adult civic engagement and attitudes provides some of the most important justifications for government intervention in the market for education. The results suggest that educational attainment has large and statistically significant effects on subsequent voter participation and support for free speech. The author also found that additional education appears to increase the quality of civic knowledge as measured by the frequency of newspaper readership.
Education level determines the standard of living

A report on the living standards of New Zealanders released by the Ministry of Social Development (2006) provides detailed information on the impact of tertiary education on living standards, using the Ministry’s Economic Living Standard Index. The report states that comparatively high average living standards scores are found among people with tertiary qualifications.

In Figure 4.43 the living standard distribution for four levels of educational qualification has been depicted. It can be seen from the graph that, overall, there is a positive association between living standards and qualification levels.

People with no formal qualifications are the most likely to have living standard scores at the lower end of the Economic Living Standard Index (levels 1–3).11 Twenty-nine percent of people in this group were in hardship, compared to 1 percent of people with a bachelors or higher qualification. The high representation of people with no formal qualification who were described as having ‘good’ living standards may in part be a consequence of the favourable living standard distribution of older New Zealanders, who tend to have lower levels of formal education. Since 2000, there has been an increase in ‘severe hardship’ amongst those with no formal qualifications and their average living standards score fell from 39.6 in 2000 to 37.3 in 2004. In 2004, those with no formal qualifications continued to have an average living standard score that was below that of the overall population. A strong relationship between living standards and parents’ qualifications is also discussed in the report. The average Economic Living Standard Index score steadily reduces from 42.5 for respondents with a bachelors degree or higher qualification, to 27.1 for respondents with no formal qualifications. The families in the latter group are only a third as likely to have a ‘very good’ living standard and are nine times as likely to live in ‘severe hardship’. The proportions of the latter group in ‘severe hardship’ rose from 15 percent in 2000 to 27 percent in 2004.

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11 Levels 1 to 3 refer to Economic Living Standards. For example levels 1 to 3 are defined as ‘severe hardship’, ‘significant hardship’, and ‘some hardship’, etc. Level 7 is ‘very good living standard’ with a score of 56 and above, whereas level 1 gets a score of 0 to 15.
Outcomes of tertiary education

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