



Is tertiary education worth it?

The returns from tertiary qualifications in Australia 2006-2016, and what this means for education institutions and government policy.



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Is undertaking tertiary education worth it? The short answer is yes, but there are twists; and the twists ought to concern education institutions and governments as they develop policy and services so that students can meet the changing world of work.

The latest data on the outcomes of Australian education have been analysed exclusively for KPMG by the National Centre for Social and Economic Modelling (NATSEM), revealing several important insights for policy makers, tertiary education leaders and prospective students.

Our tertiary education system is facing significant challenges to meet current skills shortages. It will face greater hurdles in the near future as the world of work evolves. Understanding the returns from a tertiary education is a vital tool to help reimagine the system.

Key findings

- Those who finish Year 12 earn more than those who do not.
- Those with a tertiary education qualification earn more than those whose highest qualification is the Year 12 Certificate.

No surprises so far. However, these headline results hide several other insights:

- Tertiary-educated men earn more than tertiary-educated women. This is true even when the focus is on the hourly wage (which neutralises the fact that men are more likely to be in full-time work than women).
- The earnings premium from an average Higher Education (HE) qualification remains strong.

- The earnings premium from an average Vocational Education and Training (VET) qualification has not closed the gap with HE, and actually it is no significant improvement (on average) over finishing Year 12.

These differences are apparent from raw data where the personal and social circumstances of individuals are included, so one is simply looking at 'associations' between education level and income rather than necessarily causal links. But they are also apparent when major life circumstances are controlled for, however, so that one is honing in on the actual 'returns' from the tertiary qualification itself.¹

The difference over a person's working life is also very significant.

- The NATSEM analysis estimates that the lifetime earning profiles of men and women at different education levels retain the relative gaps between HE, VET, Year 12 and Year 11.

What follows is an analysis of earnings associated with qualifications but does not take into account the costs that individual students might incur, including foregone earnings whilst studying. It is not, therefore, a Return on Investment or Cost-Benefit Analysis.

¹ No study can control for innate cognitive ability, however. We can't track how intelligent and talented individuals fare if they don't go onto tertiary study, although as tertiary study of some kind edges closer to being universal, the problem diminishes. See, however, T Griffin, "Costs and benefits of education and training for the economy, business and individuals", NCVET 2016.

The data

The *Household Income and Labour Dynamics in Australia Survey* ('the HILDA Survey') is a nationally representative longitudinal study of Australian households, which commenced in 2001 and is updated annually in 'waves', where the same households and individuals are interviewed. It is funded by the Australian Government and managed by the Melbourne Institute at the University of Melbourne.²

KPMG commissioned NATSEM to look at HILDA data from 2006, 2011 and 2016, and address questions of the

specific contribution that education makes to the current incomes of people and what their expected lifetime premium might be. The NATSEM report by Professor Rob Tanton and Associate Professor Xiaodong Gong is released contemporaneously with the publication of this paper.³

The returns

Table 1 uses raw data (i.e. without eliminating non-education variables) to contrast the weekly earnings and hourly wages for men and women in the sample across the decade, according to whether their highest qualification is HE, VET, Year 12 or below Year 12.

Table 1 – Weekly earnings and hourly wages by education levels

	2006		2011		2016	
	Male	Female	Male	Female	Male	Female
Weekly earnings (\$)						
Higher Education	1,565	1,026	2,005	1,277	2,182	1,428
Vocational Education	1,129	673	1,446	839	1,569	944
Year 12	1,129	679	1,323	905	1,397	933
Education < Year 12	905	563	1,134	711	1,242	789
Hourly wage (\$)						
Higher Education	35.4	29.5	46.3	36.7	50.6	40.9
Vocational Education	25.6	21.6	32.9	27.1	36.2	29.6
Year 12	27.8	21.2	30.1	26.8	32.9	30.0
Education < Year 12	21.7	19.3	26.9	25.2	29.8	26.1

² This paper uses unit record data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The HILDA Project was initiated and is funded by the Australian Government Department of Social Services (DSS) and is managed by the Melbourne Institute of Applied Economic and Social Research (Melbourne Institute). The findings and views reported in this paper, however, are those of the author and should not be attributed to either DSS or the Melbourne Institute.

³ The full report is available at https://www.governanceinstitute.edu.au/magma/media/upload/publication/411_Returns-to-education-in-Australia-2006-to-2016-With-Cover.pdf. A further analysis of HILDA's Education data is by Professor Roger Wilkins, *The Household, Income and Labour Dynamics in Australia Survey: Selected Findings from Waves 1 to 16*, University of Melbourne Press, 2018, which has much fascinating detail but does not attempt to estimate the returns to education, it simply describes the empirical association between education and labour market outcomes. The conclusions of the two studies appear to be consistent with each other, however.

The gender gap

The differentials are clear. Men earn more than women, at all levels of qualification. With one exception, each level of qualification leads to higher financial returns on average; a feature that has consistently been the case across the decade.

The exception is that on average a vocational qualification for women is about the same as a Year 12 Certificate for women.

When one controls statistically for non-educational factors that are identified in the HILDA methodology, such as Indigenous status, marital status, location, parental occupation and whether a person was living in a lone parent household at the age of 14, the picture is consistent.

The full-time vs. part-time view

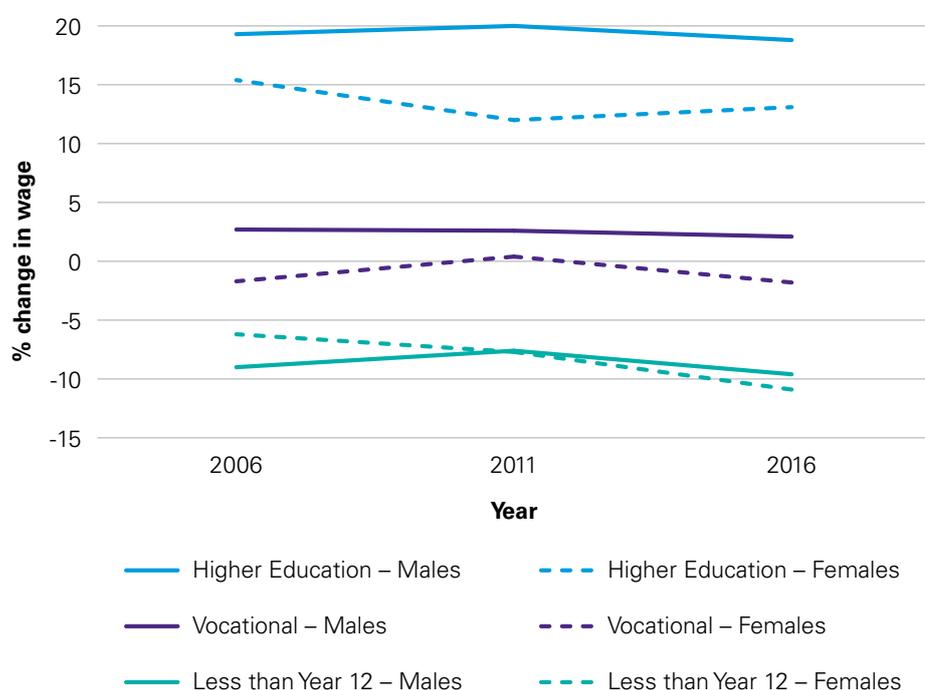
Table 2 and Figure 1 bring together data in relation to all workers, whether full-time or part-time, compared with Year 12 outcomes.

Table 2 – Earning and wage premiums

	2006		2011		2016	
	Male	Female	Male	Female	Male	Female
Wage premiums relative to Year 12 graduates						
Higher Education	19.3% ^{***} (5.09)	15.4% ^{***} (5.28)	20.0% ^{***} (6.75)	12.0% ^{***} (4.48)	18.8% ^{***} (7.08)	13.1% ^{***} (5.25)
Vocational Education	2.7% (0.79)	-1.7% (-0.58)	2.6% (0.95)	0.4% (0.15)	2.1% (0.89)	-1.8% (-0.75)
Education < Year 12	-9.0% ^{**} (-2.37)	-6.2% ^{**} (-2.24)	-7.6% ^{**} (-2.45)	-7.7% ^{***} (-2.78)	-9.6% ^{***} (-3.33)	-10.9% ^{***} (-4.00)
Earning premiums relative to Year 12 graduates						
Higher Education	21.5% ^{***} (4.69)	19.0% ^{***} (4.09)	15.0% ^{***} (4.24)	12.4% ^{***} (3.04)	14.6% ^{***} (4.21)	17.3% ^{***} (4.37)
Vocational Education	9.4% ^{**} (2.24)	-5.8% (-1.33)	3.9% (1.21)	-2.9% (-0.74)	3.3% (1.06)	3.6% (0.95)
Education < Year 12	-5.2% (-1.12)	-13.7% ^{***} (-3.10)	-9.8% ^{***} (-2.65)	-13.9% ^{***} (-3.30)	-10.4% ^{***} (-2.76)	-8.9% ^{**} (-2.06)

t statistics in parentheses, * p<0.10, ** p<0.05, *** p<0.01

Figure 1 – Wage premiums, All Workers



We can see that the returns from higher education are very significant, but they are different by gender. Male HE graduates enjoy a 19-20 percent wage premium over a Year 12 finisher, and this has been constant across the decade (19.3 percent, 20.0 percent and 18.8 percent). Women enjoyed a 15.4 percent wage premium in 2006, 12 percent in 2011 and 13.1 percent in 2016. These changes across the period are not regarded as statistically significant, but if something is actually changing, the HE premium for women seems to be trending downward rather than upward.

By contrast, with an average vocational qualification, there is a slight return over Year 12 for men, (2.7 percent, 2.6 percent and 2.1 percent across the data points), but for women it is zero or worse.

What can't be doubted is that on average it is better to finish Year 12 than leave school after Year 11.



If instead we focus only on full-time workers rather than all workers (see Table 3), compared with Year 12, the picture seems to be similar, whether the measure is hourly wage or total earnings. Male HE graduates have a 20-22 percent premium over Year 12 finishers. For women it is around 15 percent.

Table 3 – Earning and wage premiums (full time workers only)

	2006		2011		2016	
	Male	Female	Male	Female	Male	Female
Wage premiums relative to Year 12 graduates						
Higher Education	21.7%*** (5.92)	15.4%*** (5.28)	20.8%*** (7.07)	12.5%*** (3.98)	19.7%*** (7.27)	14.6%*** (4.76)
Vocational Education	3.6% (1.06)	-1.7% (-0.58)	2.1% (0.78)	-0.6% (-0.19)	1.1% (0.46)	-2.4% (-0.79)
Education <Year 12	-10.3%*** (-2.76)	-6.2%** (-2.24)	-8.3%*** (-2.64)	-5.9%* (-1.68)	-9.3%*** (-3.12)	-11.5%*** (-3.25)
Earning premiums relative to Year 12 graduates						
Higher Education	22.8%*** (5.96)	17.1%*** (4.86)	20.5%*** (6.49)	13.5%*** (4.15)	20.7%*** (7.24)	15.3%*** (4.85)
Vocational Education	4.7% (1.33)	-2.5% (-0.75)	3.2% (1.12)	-2.3 (-0.71)	3.7% (1.46)	-2.3% (-0.75)
Education <Year 12	-11.2%*** (-2.88)	-7.8%** (-2.18)	-8.6%** (-2.55)	-8.4%** (-2.31)	-8.1%** (-2.57)	-12.7%*** (-3.50)

t statistics in parentheses, * p<0.05, ** p<0.01, *** p<0.001

The lifetime lens

So far we have taken comparisons at three points in the past. What happens if we add in a model which projects life-time earnings, whilst controlling for non-educational influences?

Age-earning profiles are typically an inverse U-shape, with peak earnings at about the age of 50, as shown in Figures 2 and 3, for men and women respectively.

Figure 2 – Lifetime earning profiles of male workers with different education levels

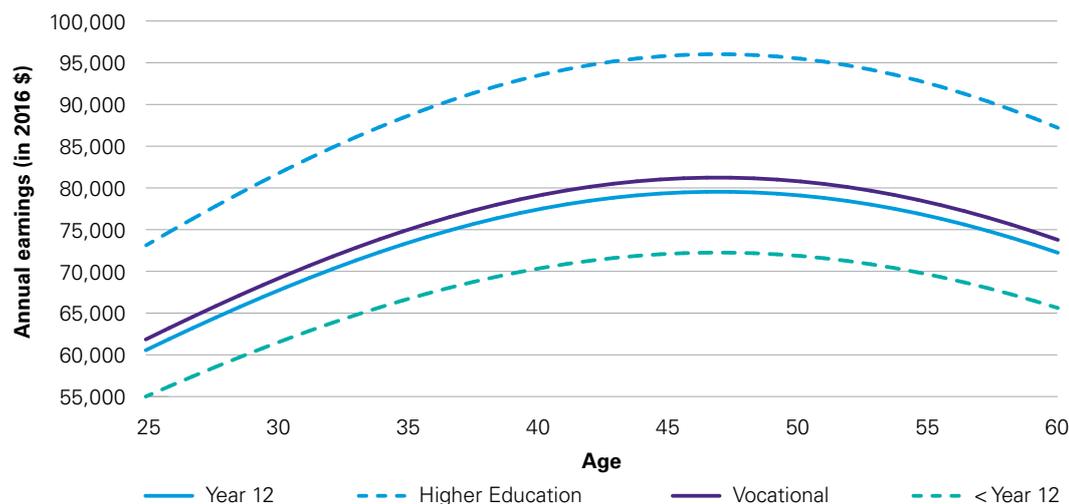
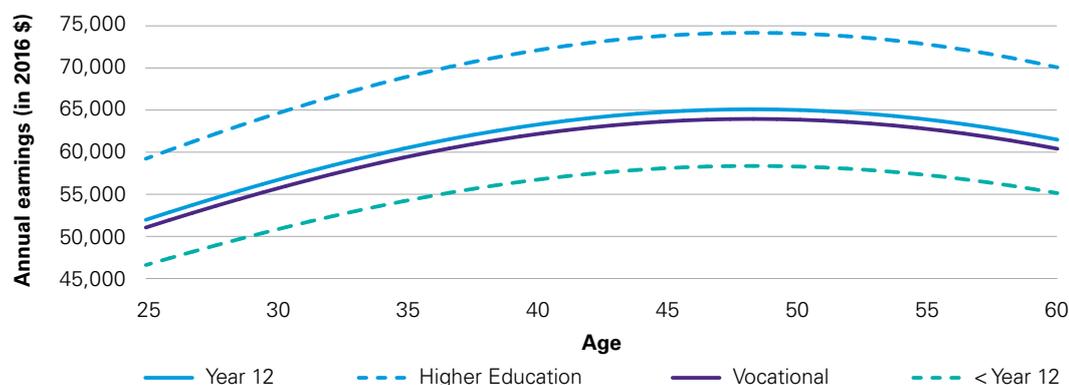


Figure 3 – Lifetime earning profiles of female workers with different education levels



The picture is clear that Year 12 is better than Year 11, men will earn more than women, and vocational education confers a small premium on men but not on women. A number of previous studies, looking at slightly different things, have suggested that the earnings premium on VET Diplomas and Advanced Diplomas can be significant, but the average is brought

down by low premiums from lower level qualifications.⁴

People will draw different conclusions from these data depending on their interest, but essentially NATSEM conclude that:

- Returns from education, especially in terms of the wage premium, have remained stable between 2006 and 2016.

- Everything else being equal, the wage premiums for higher education for men and women are about 20 percent and 15 percent respectively compared with Year 12. There is no demonstrable premium from vocational education compared with Year 12, although there is compared with Year 11.

4 See, C Polidano and C Ryan, "Long-Term Outcomes from Australian Vocational Education", Melbourne Institute, 2016, p7 and the studies cited there.

Implications for individuals

So what does this all mean for prospective students and their families? There are some important implications from the individual's perspective.

- 1 Finish Year 12 if you can.
- 2 There is no statistically significant evidence that the premium from a degree is declining, despite the huge growth in graduate attainment rates in the working age population. If it is indeed declining, it hasn't hit the HILDA sample yet. It is possible that the knowledge economy has grown in line with the increase in HE graduates.⁵ And it is possible that some of these graduates have gone into occupations previously filled by non-graduates.
- 3 Women with degrees do better than women without degrees, but not as well as men with degrees, despite three decades of female students outnumbering male students in universities.
- 4 HE counteracts other negative influences in people's lives, but of course one needs to reach HE in the first place, and those influences might be barriers to entry in the first place. This underscores the need for equity measures designed to promote participation in HE by disadvantaged groups.

- 5 VET, which covers a large range from Certificate 1 through to Advanced Diploma, is not closing the gap on HE. Nor, on average, does it really add to what a person with a Year 12 Certificate might expect; but if it takes people who would otherwise finish at Year 11 and not progress to tertiary study to the Year 12 equivalent, it performs a valuable function.

At present, a young person with the capability and means to go to university is acting rationally by doing so. As the British academic Alison Wolf said in 2003 about the UK:

"Teenagers are entirely rational in their quest for academic qualifications: ... these seem to pay much better on average than vocational ones, as well as currently opening up far more alternatives in a mobile, changing, economy."⁶

The data in this report span 2006-2016, and suggests that Australian teenagers in a position to choose should ask themselves "can I afford not to go to university?"

5 An internal KPMG analysis of ABS data on job growth by skill level shows that 46% of job growth 2011-2016 was at Skill Level 1; essentially professionals with degrees. In contrast, only 1% of jobs growth was at Skill Level 3, equating to Certificate III and IV occupations.

6 Alison Wolf, *Does Education Matter?*, Penguin, 2003, p95.

Questions for governments

While tertiary education is worth it, something is wrong if tertiary-educated men receive a higher average hourly rate than tertiary-educated women. Female students have outnumbered male students for three decades in universities. What effect is this having on the economy and our society?

What are the long-term implications for Australian businesses and consumers if stubborn skill shortages go unaddressed?

What if Australia is not ready for an abrupt shift in the world of work, which puts a premium on skills and capabilities we are not focusing on sufficiently in our tertiary system?

With the momentum behind HE, it could take many years for a message to filter through to young people, parents, schools and career advisers that the market might be shifting the relative rewards from HE and VET.

If Australia is to ease skill shortages, keep skilled migration to a politically acceptable level, and be ready for the technological and economic changes ahead, Australia needs to respond at the policy level and reimagine our tertiary sector.

The highest priority is to fix the VET sector, making it more attractive to some who are currently going to university, as well as catering for the huge needs that are arising for upskilling, reskilling and retraining arising out of technological change and people's greater longevity.



Time to reimagine tertiary education

Optimists say the Fourth Industrial Revolution will create more jobs than it removes. Pessimists say the point of automation is to remove jobs, and the goal of this revolution is automation on the grandest of all scales.

In between are those who say that more jobs might eventually be created than destroyed, but they won't necessarily be for the same kinds of people, they may be in different countries, and they may be slow to evolve. In the meantime, there will be huge dislocation, and the disadvantaged will increasingly question the social order, perhaps through direct action.

Australia could possibly just 'live with the issue'; but in today's technology age, and with the country changing, Australia could find itself short of the technical, creative and other skills needed to compete on a global scale. In fact, of 24 areas of skill shortage that were in the Commonwealth Government's list in 2017, and had also been in the list in at least five of the previous ten years, 21 were in trades and technician areas, served by VET, and only 3 were in professional areas served by HE.⁷

One argument is that it will correct itself in the long run. We can imagine a situation where so many graduates enter the labour market that the degree is no longer the signalling mechanism that helps employers sort out the more talented from the less talented. Employers could either pick and choose between types of universities, or differentiate between candidates on the basis of their own testing, or IQ tests, or Year 12 results. Some universities could re-invent

themselves and focus more on the training market. At the same time, skill shortages will push up wage returns for vocational qualifications, the argument goes, so more young people will choose VET rather than HE, or they will seek out more vocationally oriented universities. The market could reach a better equilibrium.

The problem with this theory is that it could take a long time and, as the economist John Maynard Keynes said in 1923, "in the long run we are all dead."

The prudential course is to say, "if the pessimists are right, then the consequences could be so disastrous that we should take mitigating action now."

This is the case for policy intervention to re-balance tertiary education by re-designing it, outlined in KPMG's report *Reimagining Tertiary Education: From Binary System to Ecosystem*.⁸ It calls for a new tertiary education which combines elements of higher and vocational education in new ways.

In future papers, we will look further into the NATSEM findings, in relation to family background, gender and other variables, and we will bring in international comparisons. We will also compare these findings with those by Andrew Norton and Ittima Cherastidtham of the Grattan Institute, using mainly Commonwealth and Australian Bureau of Statistics data rather than HILDA.⁹

This general analysis of the data is, however, enough to show that there are major questions to be addressed if we are to work towards a fair and efficient society that equips us for a changing future.

7 See <https://docs.jobs.gov.au/documents/historical-list-skill-shortages-australia-0>

8 <https://home.kpmg.com/au/en/home/insights/2018/08/reimagining-tertiary-education.html>
August 2018

9 See A Norton and I Cherastidtham, *Mapping Australian higher education 2018*, Grattan Institute, 2018, chapter 10

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