# Educational Outcomes of Young Indigenous Australians

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## Supporting appendices

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# 1. Introduction

This document complements *Educational outcomes of Young Indigenous Australians* (Mahuteau et al. 2015), by providing a fuller set of descriptive statistics, morel detail of the methodology and a fuller set of model results.

The structure of the document is as follows. In the next section we compare the socioeconomic background and education outcomes of Indigenous and non-Indigenous students. We then focus on modelling the differences in PISA scores between Indigenous and non-Indigenous students. Section 4 models subsequent education outcomes – School dropout, Year 12 completion, Intention to attend University, ATAR request, University participation, VET participation- conditional on PISA, background characteristics and school characteristics. The appendix tables contain a full-set of the model results.

# 2. Comparisons between Indigenous and non-Indigenous students: socioeconomic background and education outcomes

## 2.1 Comparing Indigenous and non-Indigenous students' socio economic background

The following table shows the number (and proportions) of Indigenous and non-Indigenous students who are eligible to be sampled for PISA in 2006 and 2009. These numbers are computed using the weights available in the PISA data (population weighted numbers). The second part of the table shows the actual numbers and proportions of Indigenous students present in the PISA data. We see that while the population numbers place the proportion of Indigenous students of PISA age/grade at around 3% of the total number of students, PISA oversamples Indigenous students to around 7%.

**Table 1: Proportion of Indigenous students in the population and in the PISA sample**

| | 2006 | 2009 | Total | 2006 | 2009 | Total |
|---|---|---|---|---|---|---|
| | *Count* | *Count* | *Count* | *%* | *%* | *%* |
| **Population weighted:** | | | | | | |
| **Non-Indigenous** | 228,049 | 233,143 | 461,192 | 97.07 | 96.80 | 96.93 |
| **Indigenous** | 6,891 | 7,708 | 14,599 | 2.93 | 3.20 | 3.07 |
| **Total** | 234,940 | 240,851 | 475791 | 100.00 | 100.00 | 100.00 |
| **PISA sample:** | | | | | | |
| **Non-Indigenous** | 13,090 | 13,108 | 26,198 | 92.38 | 91.98 | 92.18 |
| **Indigenous** | 1,080 | 1,143 | 2,223 | 7.62 | 8.02 | 7.82 |
| | 14,170 | 14,251 | 28,421 | 100.00 | 100.00 | 100.00 |

Source: PISA 2006 and 2009

Following are a number of tables and graphs comparing Indigenous and non-Indigenous students based on some indicators of socio economic background in both 2006 and 2009 cohorts.

## ❖ Parental education background

**Table 2: Parental education (percentage of sample, population weighted)**

| | 2006 | | 2009 | |
|---|---|---|---|---|
| | Non-Indigenous | Indigenous | Non-Indigenous | Indigenous |
| **Mother completed Year 12** | 55.0 | 36.9 | 59.0 | 39.5 |
| **Mother completed at least Y10** | 72.5 | 64.2 | 92.8 | 83.2 |
| **Father completed Y12** | 49.7 | 27.5 | 54.8 | 34.2 |
| **Father completed at least Y10** | 72.3 | 54.3 | 90.4 | 80.0 |
| **Maternal highest level of education is bachelor and above)** | 27.5 | 14.2 | 29.3 | 15.2 |
| **Paternal highest level of education is bachelor and above)** | 28.0 | 7.9 | 28.4 | 9.7 |
| **Maternal highest level of education is TAFE** | 28.2 | 29.1 | 25.0 | 28.1 |
| **Paternal highest level of education is TAFE** | 29.2 | 26.7 | 27.9 | 26.0 |

*Note*: parental post-school education data suffers from a considerable number of missing observations, with the rate higher for Indigenous students. The estimates are a proportion of all observations, including those where parental post-school education is missing

We see that the parents of Indigenous students on average have considerably lower levels of education; the proportions completing year 10 and year 12 are lower as is the proportion with a university degree. The proportions of parents of Indigenous students who have a TAFE qualification is similar to that of parents of non-Indigenous students (in fact higher for mothers) but this in itself is a marker of disadvantage and reflects the proportions without a university qualification.

## ❖ Students' socioeconomic background

The PISA data include a number of socioeconomic indices which summarize socioeconomic background in a multidimensional way, through principal component analysis. Here we present the means of the home possession index, the wealth index and the economic, social and cultural status (ESCS) index (Figure 1, Figure 2 and Figure 3).

What these population means show us is that, whichever measure used, Indigenous students lag behind non-Indigenous students by a wide margin. It is noteworthy that the value of these indices increases between the 2006 and 2009 cohort for both Indigenous and non-Indigenous students. This finding is somewhat puzzling because one would not expect the population to change a great deal in three years. It suggests that somehow the two samples are picking up a different distribution of households. If this is the case then it emphasises the importance of looking at the multivariate relationships rather than sample or population means.

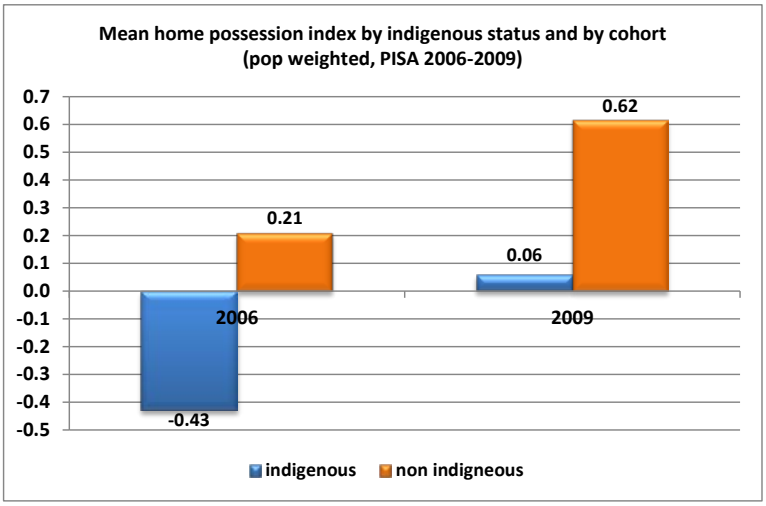


**Figure 1: Mean home possession index by Indigenous status by cohort**

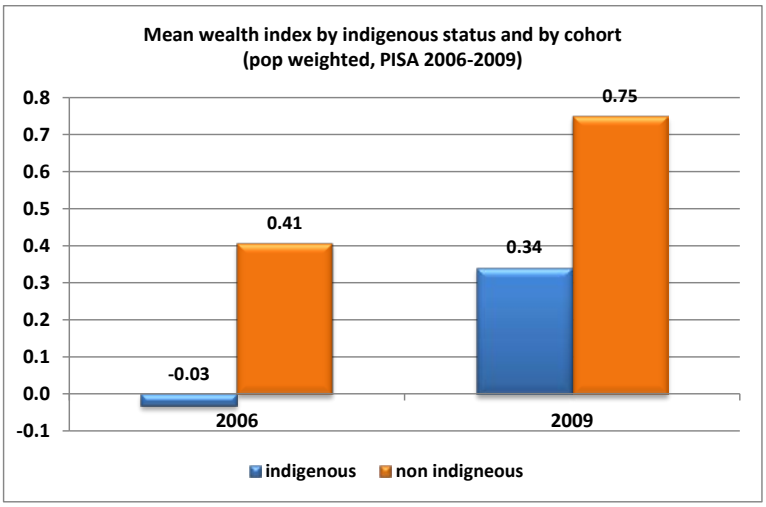


**Figure 2: Mean wealth index by Indigenous status by cohort**

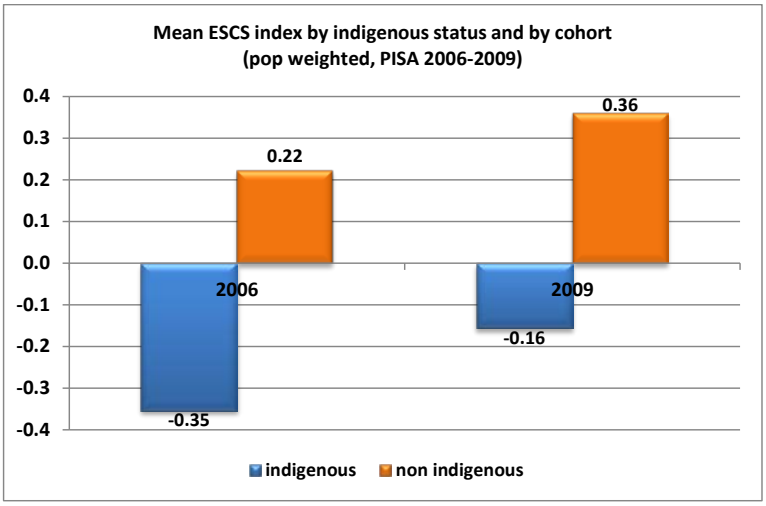


**Figure 3: Mean ESCS index by Indigenous status by cohort**

## 2.2 Comparing Indigenous and non-Indigenous students' educational outcomes: PISA scores

Figure 4 shows the mean 2006 PISA scores by subject and by Indigenous status, with 95% confidence intervals (the wider confidence intervals around the Indigenous means is because of the smaller sample size).

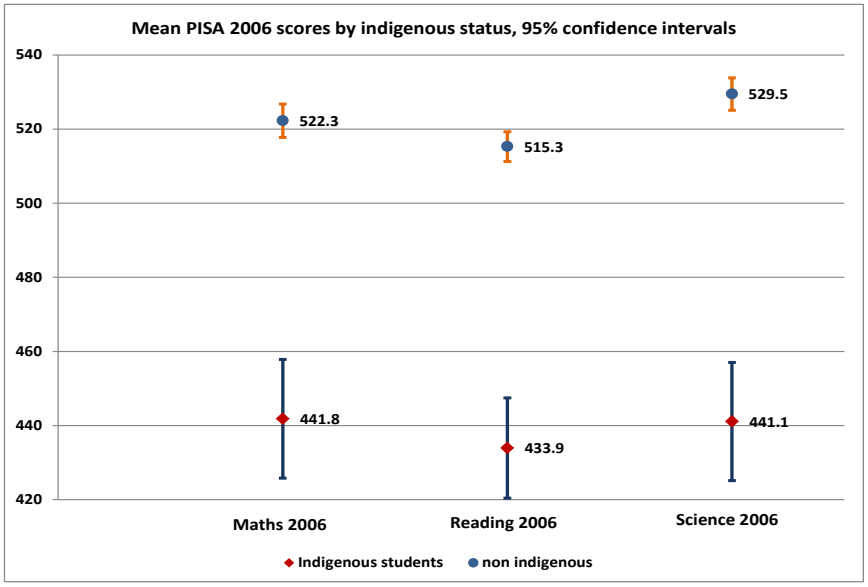


**Figure 4: Mean scores in Math, Reading and Science by Indigenous status, including confidence intervals (population weighted- PISA 2006)**

The OECD computes 'proficiency levels' which allow PISA scores to be categorised in a meaningful way in terms of ability (see OECD PISA 2006 and 2009 reports). For reading, 6 proficiency categories are defined according to the following thresholds:

- Below level 1 proficiency: Reading score below 334.75
- Level 1 proficiency: Reading score between 334.75 and 407.47
- Level 2 proficiency: Reading score between 407.47 and 480.18
- Level 3 proficiency: Reading score between 480.18 and 552.89
- Level 4 proficiency: Reading score between 552.89 and 625.61
- Level 5 proficiency: Reading score above 625.61

Figure 5 shows the distribution of the students according to these proficiency thresholds and by Indigenous status.

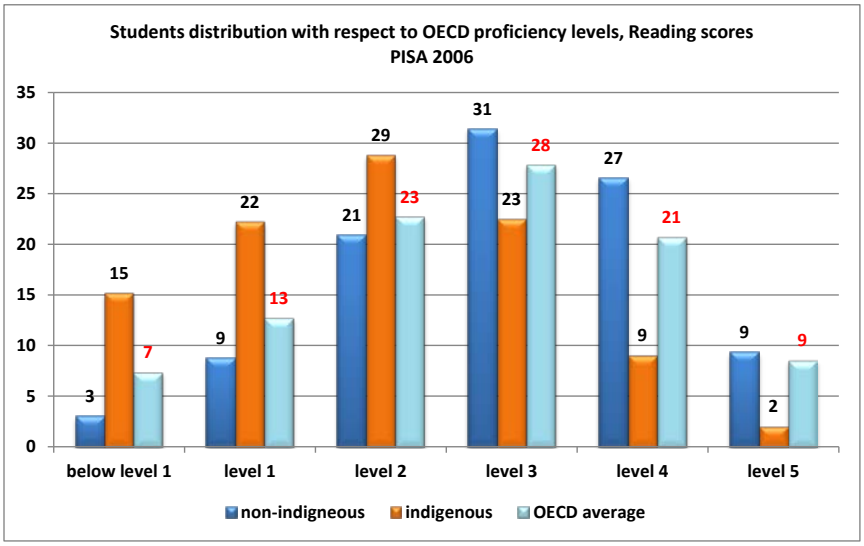


**Figure 5: Distribution of students according to OECD's proficiency levels, by Indigenous status, PISA 2006**

For comparison purposes we have added the OECD average distribution in Figure 5 to show the extent to which PISA score outcomes of Australian Indigenous students differ from those of Australian non-Indigenous students.

The 2009 data show a similar pattern (Figure 6 and Figure 7).

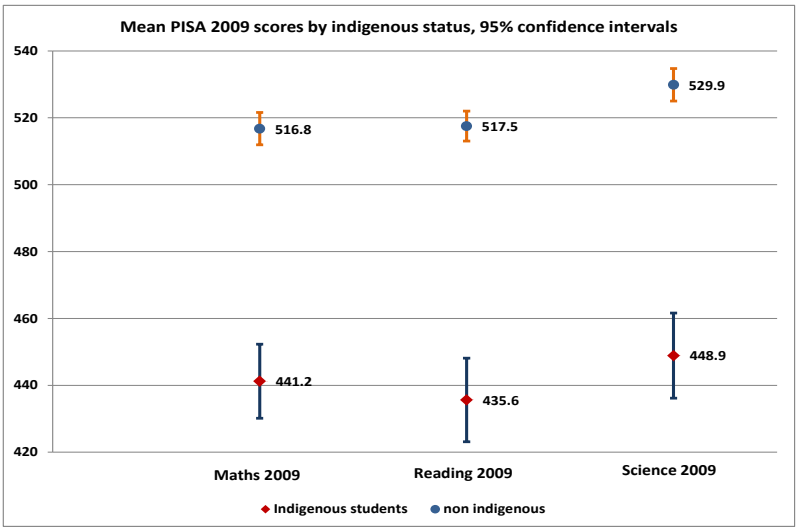


**Figure 6: Mean scores in Math, Reading and Science by Indigenous status, including confidence intervals (population weighted- PISA 2009)**

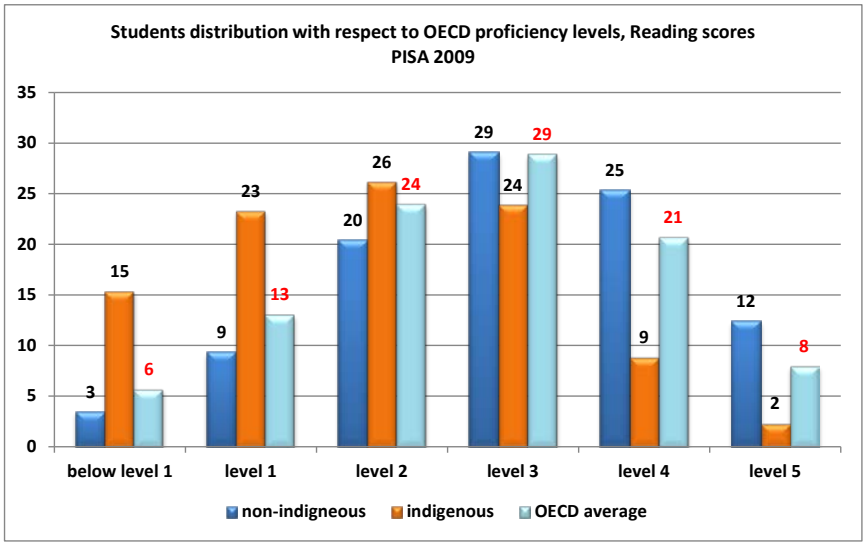


**Figure 7: Distribution of students according to OECD's proficiency levels, by Indigenous status, PISA 2009**

Figure 8 shows the distribution of Indigenous and non-Indigenous students across quintiles for 2006 and 2009.

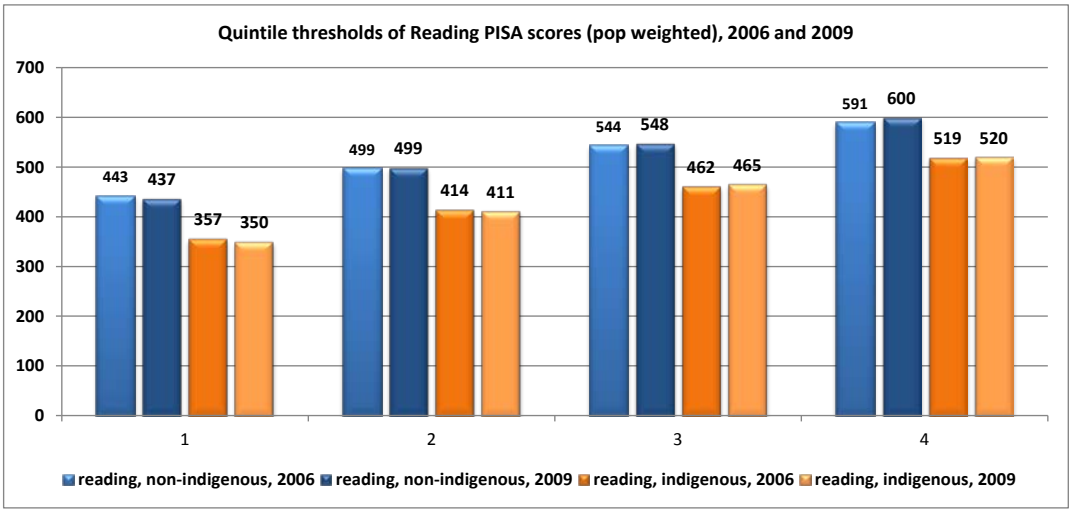


**Figure 8: Quintile thresholds of Reading PISA scores by Indigenous status**

The main point is that the changes in the relative reading scores of Indigenous and non-Indigenous students between 2006 and 2009 are very small. A similar observation can be made in respect of the numeracy and science test scores.

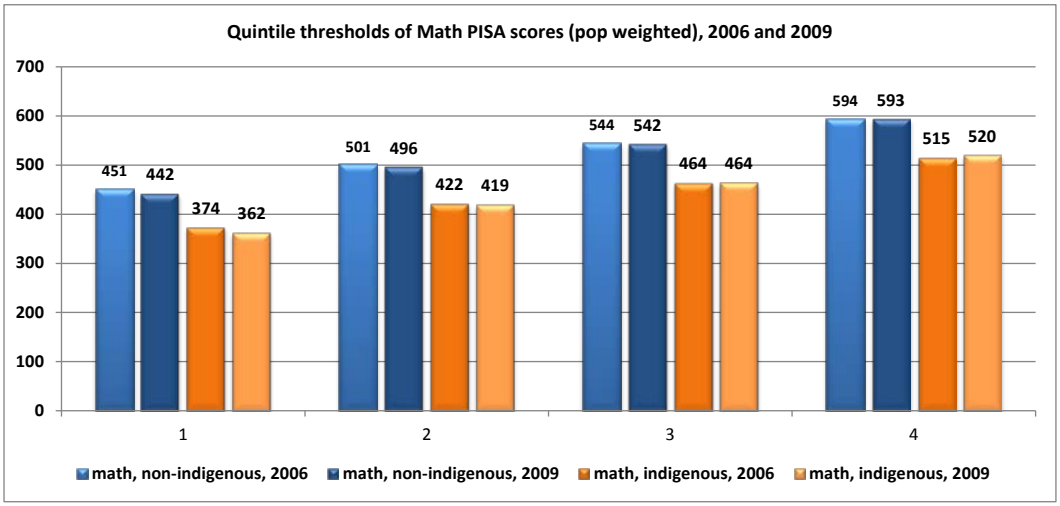


**Figure 9: Quintile thresholds of Math PISA scores by Indigenous status**

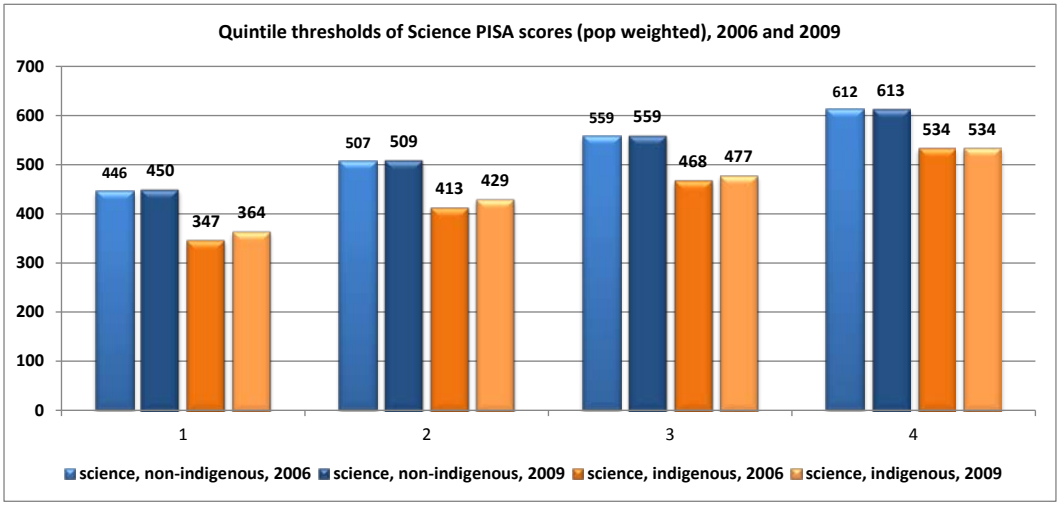


**Figure 10: Quintile thresholds of Science PISA scores by Indigenous status**

# 3. Analysis of the standardised test score differences between Indigenous and non-Indigenous students

## 3.1 Indigenous student and cohort effects in a multilevel model of PISA scores

We estimate a multilevel model of PISA scores, highlighting the expected score gaps between Indigenous and non-Indigenous students, once individual and school characteristics are taken into account. The multilevel structure of the estimations allows us to control for unobserved school effects. In other words, we account for the possibility that students belonging to the same school benefit (or suffer) from an educational environment which produces a systematic effect on students' scores, independently of their own characteristics and of the observable characteristics of their school. For given individual and school characteristics, students may incur a score penalty or bonus by the simple fact that they attend a given school rather than another. The model involves both cohorts of students, 2006 and 2009 and cohort effects are captured through a cohort dummy and interactions between a number of individual variables and the cohort dummy.

### 3.1.1 Multilevel regression method

The PISA element of the LSAY data used for the estimation involves a hierarchical structure comprising students at the first level who are nested in schools at the second level. The LSAY data does not contain the school information of the PISA element (wave 1 of LSAY), hence we merged this information to the LSAY data in order to have a complete dataset. The sampling design of the PISA data is such that schools are selected to participate and then students belonging to these schools are randomly drawn to participate in the standardised tests and answer a questionnaire. The PISA data is a particularly rich source because it gathers information at the second level through a school questionnaire answered by the principal of each school.

Having information at both levels enables us to distinguish between variation in student scores within a school (within school variation) and variation in the average scores of students in different schools (between school variation). This offers more opportunity to control for the effect on students' scores of unobserved heterogeneity (diversity) arising from school differences.

Students belonging to the same schools are expected to be more alike in their socio economic characteristics than students from different schools. Similarly, students in the same school are expected to share the same teachers for some subjects, and benefit from the same facilities and environment. Because of these effects, we would expect the score of students belonging to the same school to be more alike than for students in different schools. Treating each student observation as independent (when some are actually linked by going to the same school) would lead to potentially large bias in the estimation of the determinants of their score. We therefore use multilevel models to address this issue and investigate school effects on scores as well as student effects. Being able to look at what happens at the second level represented by the schools gives our estimation results more scope to investigate policy implications related to social disadvantages.

We adopt the following specification for the multilevel model on scores,

$$Score_{kij} = X_{ij}\beta + Z_j\gamma + \lambda_0 t_{ij} + \lambda_1 Ind_{ij} + \lambda_2 t_{ij} \cdot Ind_{ij} + U_j + U_{ij} \quad (1)$$

Where index *k* refers to the subject, *k={reading, math, science},* index *j* refers to individual schools and index *i* refers to individual students.

$X_{ij}$ represents a vector of individual characteristics of the student *i* attending school *j*.

$Z_j$ represents a vector of individual school (observable) characteristics which are equally shared among all students attending the same school. It also contains some school variables interacted with the cohort dummy.

$t_{ij}$ is a cohort indicator variable which takes the value 1 for observations made in 2009 and 0 for 2006.

Note that some of the individual characteristics in $X_{ij}$ are interacted with the cohort variable *t,* but unlike the Indigenous indicator variable $Ind_{ij}$ they are not explicitly written in Equation (1) above, since they are of secondary importance.

Note that the estimated coefficient of the cohort variable $\lambda_0$ does not in itself indicate whether scores have improved between 2006 and 2009 (always *ceteris paribus*). This is because other variables of the model are interacted with the cohort dummy.

$Ind_{ij}$ and $t_{ij} \cdot Ind_{ij}$ represent, respectively, a dummy recording whether the student is Indigenous and the same dummy interacted with cohort. Their estimated coefficients for these two variables are of prime importance which explains why they have been written out explicitly in Equation (1). The coefficient of $Ind_{ij}$ estimates the penalty incurred by cohort 2006 Indigenous students with regards to scores. The coefficient of $t_{ij} \cdot Ind_{ij}$ estimates how this penalty changes for the 2009 cohort of Indigenous students. A negative (positive) coefficient would suggest that the score penalty associated with being an Indigenous student decreased (increased) between 2006 and 2009.

$U_j$ represents the random school effect which we estimate by maximum likelihood for all schools of the sample. Finally, $U_{ij}$ represents the unexplained part of the PISA scores, usually attributed to student individual unobserved characteristics. The next section discusses the results of the estimation of this model and focusses our attention on the 'Indigenous student penalty', to establish whether scores appear to have improved for Indigenous students after we have controlled for all observable factors. We also focus on the effect of socioeconomic background on scores and provide an analysis of the random school effect, both by Indigenous status.

Estimation has been carried out using STATA.

### 3.1.2 Multilevel regression results

Table A1 presents the results of the multilevel model on PISA scores as defined in equation (1).

One advantage of the multilevel specification of these estimations is that we are able to estimate a school effect which is interpreted in the education literature as an indicator of school quality. The estimate of school quality for a given school indicates the extent to which studying in that school is associated with either a penalty or a premium over and above the effect of observable characteristics of the school itself and its students. It controls for the fact that, among all unobservable factors that may influence scores, students of a same school are more alike than students taken from different schools. It would notably be due to the education environment of the school, the quality of its teachers, the motivation of the staff and students, etc. These aspects of a school are shared by its students and can result in a significant score premium or penalty. We estimated this 'school quality' (random intercept) for each school and compared its distribution between Indigenous and non- Indigenous students. The results are displayed in Figure 11 and Figure 12 below, showing the distribution of school quality between Indigenous and non-Indigenous students by cohort.

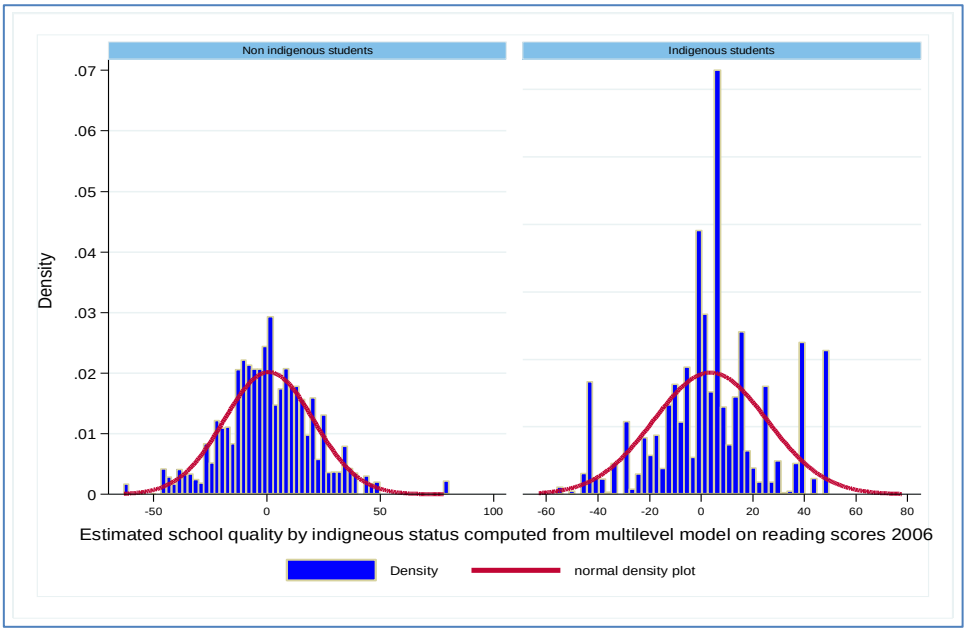


**Figure 11: Estimated school quality by Indigenous status based on reading scores PISA 2006**

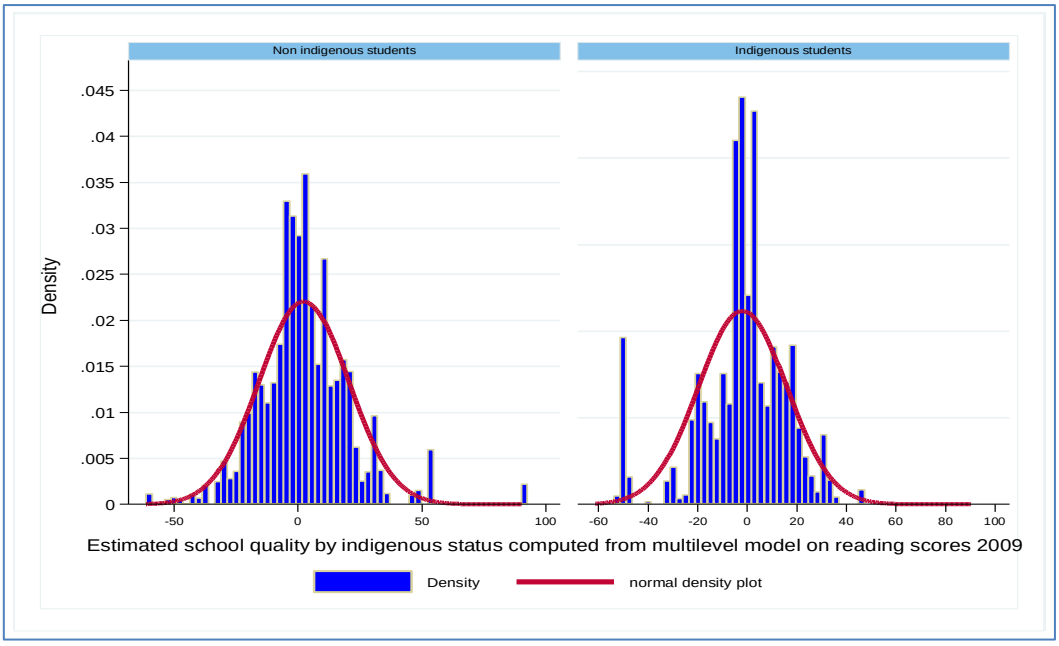


**Figure 12: Estimated school quality by Indigenous status based on reading scores PISA 2009**

Figure 11 and Figure 12 highlight the difference with regards to the distribution of estimated school quality between Indigenous and non-Indigenous students. We observe a wider spread for Indigenous students, accompanied by larger densities around the mean school quality normalised at 0. This means that a larger proportion of Indigenous students are observed in schools whose estimated quality does not provide them with a score premium or penalty compared to non-Indigenous students. At the same time, the larger spread means that there is a comparatively a larger proportion of students at both tails of the distribution. In 2006 and more in 2009 there appear to be a number of Indigenous students who attend a school with remarkably low quality score outputs.

Comparing 2006 and 2009, we see that the distribution of school quality for Indigenous students narrows down significantly in 2009 and becomes more comparable to that of the non-Indigenous students. The riskiness of school outcomes for Indigenous students (in terms of the distribution being more broadly spread in both directions) appears to have been reduced considerably in 2009 by concentrating PISA score results closer to the national mean. The change between the 2006 and 2009 cohorts are confirmed by a Kolmogorov-Smirnov test which shows that the distributions in 2006 and 2009 are significantly different between Indigenous and non-Indigenous students. We corroborate this result with a Mann-Whitney test. Interestingly, the p-value obtained for this test for 2009 is 0.0546 against 0.0000 for 2006.

## 3.2 Decomposition of the standardised score differences between Indigenous and non-Indigenous students: what changes between 2006 and 2009

There is no clear theoretical or statistical guidance as to the best decomposition method or underlying model specification. We implement the decomposition using a model that includes all variables found empirically to be important determinants of student outcomes, or known to be theoretically important determinants of student outcomes. We only present decompositions based on Reading scores as their results remain largely unchanged when we base them on either Mathematics or Science scores.

### 3.2.1 Methodology of the decompositions

We perform a decomposition of the students' scores between non-Indigenous (high scores group, denoted as *NI*) and Indigenous students (low score group, denoted as *Ind*) using the estimated model on scores along the lines of Oaxaca and Blinder (1976) and using additional formulations proposed in the literature (Cotton, Reimers). For presentation purposes we start by writing the simplest of decomposition which is a special case of the more general decomposition we actually implement.

We use indices *Ind* and *NI* to denote the group we are referring to. Using this notation, we can write the differences in scores between non-Indigenous and Indigenous students as (for simplicity we bundle all regressors from the model into a single matrix *X* which includes both students and school characteristics):

$$Score_{NI} - Score_{Ind} = \Delta X \beta_{Ind} + \Delta\beta \; X_{Ind} + \Delta X \Delta\beta = E + C + CE \quad (2)$$

Where $\Delta$ stands for the difference operator (differences between the two groups).

*E* stands for the Endowment effect, *C* for the coefficient effect ('return to characteristics') and *CE* represents the gap arising from the interaction of endowment and coefficients. Depending on the formulation chosen, *CE* is either included into the explained part of the differences between the groups or in the unexplained component (especially when one looks at differences in terms of discrimination). This aspect can be summarised through the two ways in which the gaps in scores can be written, namely:

$$Score_{NI} - Score_{Ind} = \Delta X \beta_{Ind} + \Delta\beta \; X_{NI} = E + \left(C + CE\right) \quad (3)$$

$$Score_{NI} - Score_{Ind} = \Delta X \beta_{NI} + \Delta\beta \; X_{Ind} = \left(E + CE\right) + C \quad (4)$$

In the first decomposition, the interaction effect is included into the unexplained part while it is in the explained part in the second. Note that each of these decompositions takes one group as the reference, which is potentially an issue. As a result other formulations define a reference which is a combination of both groups, using weights.

The decomposition that we actually implement is a more general formulation, using weights as follows:

$$Score_{NI} - Score_{Ind} = \Delta X \left(D\beta_{NI} + \left(I - D\right)\beta_{Ind}\right) + \Delta\beta \; \left(X_{NI}\left(I - D\right) + X_{Ind} D\right) \quad (5)$$

Where *I* represents the identity matrix and *D* is the matrix of weights. The Oaxaca decomposition as written in equations (3) and (4) correspond to D being either 0 or 1. We display the results of the decomposition for these two cases along with Cotton's and Reimers' decompositions corresponding respectively to a weight of 0.5 ($diag\left(D\right) = 0.5$ ) and a weight equal to the sample proportion of non-Indigenous students ($diag\left(D\right) = F_{NI}$) . For those two latter decompositions, the interaction effect (*CE)* is partly included into the explained and unexplained part of the score gaps according to weight used.

We concentrate on the decomposition of reading scores, the results on maths and science scores being very similar. The full decomposition is shown in Table A2. We note that the choice of D is not that important; the decomposition is quite robust.

# 4. Beyond standardised test scores: Analysis of the differences between Indigenous and non-Indigenous students along the education pathway

This section focusses on what happens after the PISA scores have been obtained. The objective is to establish the potential impact of PISA scores on several later-schooling and end-of-schooling outcomes, including school drop-out, Year 12 completion, ATAR requests, intention to go to university, university enrolment and TAFE participation and training.

## 4.1 Educational outcomes after PISA: The LSAY data

We use the reference population described in Table 3 for the remaining descriptive analyses as well as for the subsequent multivariate estimations on student education pathways and outcomes.

**Table 3: LSAY: reference population used for LSAY analysis**

| LSAY reference population: Students with known schooling history by LSAY wave 4 | | | |
|---|---|---|---|
| | Non Indigenous | Indigenous | Total |
| **2006** | | | |
| **No** | 5,438 | 648 | 6,086 |
| **Yes** | 7,533 | 422 | 7,955 |
| **Removed (inconsistent)** | 119 | 10 | 129 |
| **Total** | **13,090** | **1,080** | **14,170** |
| **2009** | | | |
| **No** | 6,316 | 762 | 7,078 |
| **Yes** | 6,666 | 374 | 7.040 |
| **Removed (inconsistent)** | 126 | 7 | 133 |
| **Total** | **13,108** | **1,143** | **14,251** |

## 4.2 Observed differences between Indigenous and non-Indigenous students along the education pathway: Descriptive statistics

We review the schooling outcomes we are interested in for the analysis and provide a comprehensive set of descriptive statistics before moving on to more elaborate analysis.
We are interested in the following outcomes along the student education pathways:

- School dropout: The propensity to drop out of school before completing Year 12 and without engaging into further education above Certificate 2 at any point during the observation window of the data.
- Year 12 completion: The propensity to complete Year 12. Given our purposely narrow definition of school dropout, Year 12 completion is not the exact opposite of school dropout, which justifies us looking at Year 12 completion independently. Year 12 completers are those students who completed year 12, whether they later engage or not into further education. Those who do not complete year 12 differ from our definition of school dropout in the sense that the latter includes only those who do not engage in any study above Certificate 2 after dropping out while the Year 12 non completers can drop at year 10 or 11 and still engage in vocational training at a level above Certificate 2.
- Intention to attend University: Students have stated their intention to engage in University education or not. This indicator is particularly interesting as it gives us some

knowledge about the state of mind of the students along the education pathway and its analysis may shed some light as to which are the determinants (especially the limiting factors) of students' intentions to pursue they education at the tertiary level.

- ATAR request: The question is whether or not students request an ATAR score, that is, whether they follow up their intention of going to University with requesting an ATAR which will allow them to apply for University. The LSAY data also contains the actual individual ATAR scores. Unfortunately, this information is not well populated and one loses too many observations for estimations distinguishing Indigenous and non-Indigenous students to be meaningful.
- University participation: This variable looks at the participation at university in 2009 for the 2006 cohort and 2012 for the 2009 cohort. Thus it captures the proportion going to university immediately after completion of school. It does not capture those who attend university at a later age.
- VET participation: This variable is analogous to the university participation variable, but looking at the proportion of students attending VET (at the certificate III level of higher) in 2009. As for the university participation outcome it does not capture those who undertake VET at a later age.

The descriptive statistics we present below show *prima facie* evidence of large differences between Indigenous and non-Indigenous student outcomes, in the form of extensive disadvantage of Indigenous students for all outcomes. However, as with all such data descriptions, one must bear in mind that, since these are only univariate descriptive statistics, they may conceal relevant evidence. Multivariate analysis is used later to make more meaningful comparisons between Indigenous and non-Indigenous education pathways.

### 4.2.1 School dropout

Table 4 (sample statistics) and Table 5 (population weighted) show the frequencies and proportions of students who are recorded as dropping out of school before completing Year 12 (and without engaging into further education above Certificate II later

**Table 4: School dropout rates by Indigenous status, LSAY**

| Drop out (sample statistics) based on the students left in the sample in 2009/2012 | | | | | | |
|---|---|---|---|---|---|---|
| | **Non Indigenous** | **Indigenous** | **Total** | **Non Indigenous** | **Indigenous** | **Total** |
| | No. | No. | No. | % | % | % |
| **2006** | | | | | | |
| **No** | 6,121 | 263 | 6,384 | 81.26 | 62.32 | 80.25 |
| **Yes** | 1,412 | 159 | 1,571 | 18.74 | 37.68 | 19.75 |
| **Total** | **7,533** | **422** | **7,955** | **100.00** | **100.00** | **100.00** |
| **2009** | | | | | | |
| **No** | 5,719 | 264 | 5,983 | 85.79 | 70.59 | 84.99 |
| **Yes** | 947 | 110 | 1,057 | 14.21 | 29.41 | 15.01 |
| **Total** | **6,666** | **374** | **7,040** | **100.00** | **100.00** | **100.00** |

**Table 5: School dropout rates by Indigenous status, LSAY, Population weighted**

| Drop out (population weighted) based on the students left in the sample in 2009/2012 | | | | | | |
|---|---|---|---|---|---|---|
| | Non Indigenous | Indigenous | Total | Non Indigenous | Indigenous | Total |
| | No. | No. | No. | % | % | % |
| **2006** | | | | | | |
| **No** | 108,256 | 1,982 | 110,238 | 82.40 | 69.11 | 82.12 |
| **Yes** | 23,116 | 886 | 24,002 | 17.60 | 30.89 | 17.88 |
| **Total** | **131,371** | **2,869** | **134,240** | **100.00** | **100.00** | **100.00** |
| **2009** | | | | | | |
| **No** | 103,987 | 1,845 | 105,832 | 86.92 | 72.68 | 86.63 |
| **Yes** | 15,644 | 694 | 16,338 | 13.08 | 27.32 | 13.37 |
| **Total** | **119,631** | **2,539** | **122,170** | **100.00** | **100.00** | **100.00** |

### 4.2.2 Year 12 completion

Table 6 (sample statistics) and Table 7 (population weighted) show the proportions of students from each cohort who complete Year 12. This includes students who later move on to further education and students who do not. Those who are flagged as not having completed Year 12 do not correspond to those who were flagged as dropping out of high school since we adopted a more restrictive definition of school dropout.

**Table 6: Year 12 completion rates by Indigenous status, LSAY**

| Complete year 12 (sample statistics) based on the students left in the sample in 2009/2012 | | | | | | |
|---|---|---|---|---|---|---|
| | Non Indigenous | Indigenous | Total | Non Indigenous | Indigenous | Total |
| | No. | No. | No. | % | % | % |
| **2006** | | | | | | |
| **No** | 1,407 | 160 | 1,567 | 18.68 | 37.91 | 19.70 |
| **Yes** | 6,126 | 262 | 6,388 | 81.32 | 62.09 | 80.30 |
| **Total** | **7,533** | **422** | **7,955** | **100.00** | **100.00** | **100.00** |
| **2009** | | | | | | |
| **No** | 1,446 | 132 | 1,578 | 21.69 | 35.29 | 22.41 |
| **Yes** | 5,220 | 242 | 5,462 | 78.31 | 64.71 | 77.59 |
| **Total** | **6,666** | **374** | **7,040** | **100.00** | **100.00** | **100.00** |

**Table 7: Year 12 completion rates by Indigenous status, LSAY, Population weighted**

| Complete year 12 (population weighted) based on the students left in the sample in 2009/2012 | | | | | | |
|---|---|---|---|---|---|---|
| | Non Indigenous | Indigenous | Total | Non Indigenous | Indigenous | Total |
| | No. | No. | No. | % | % | % |
| **2006** | | | | | | |
| **No** | 23,402 | 886 | 24,288 | 17.81 | 30.87 | 18.09 |
| **Yes** | 107,969 | 1,983 | 109,952 | 82.19 | 69.13 | 81.91 |
| **Total** | **131,371** | **2,869** | **134,240** | **100.00** | **100.00** | **100.00** |
| **2009** | | | | | | |
| **No** | 24,259 | 884 | 25,143 | 20.28 | 34.81 | 20.58 |
| **Yes** | 95,372 | 1,655 | 97,027 | 79.72 | 65.19 | 79.42 |
| **Total** | **119,631** | **2,539** | **122,170** | **100.00** | **100.00** | **100.00** |

### 4.2.3 Request ATAR

Table 8 (sample statistics) and Table 9 (population weighted) show the proportions of students from each cohort who requested an ATAR score.

**Table 8: ATAR score request by Indigenous status, LSAY**

| Received an ATAR (sample statistics) based on the students left in the sample in 2009/2012 | | | | | | |
|---|---|---|---|---|---|---|
| | Non Indigenous | Indigenous | Total | Non Indigenous | Indigenous | Total |
| | No. | No. | No. | % | % | % |
| **2006** | | | | | | |
| **Did not request ATAR** | 3,205 | 288 | 3,493 | 42.55 | 68.25 | 43.91 |
| **Request ATAR** | 4,328 | 134 | 4,462 | 57.45 | 31.75 | 56.09 |
| **Total** | **7,533** | **422** | **7,955** | **100.00** | **100.00** | **100.00** |
| **2009** | | | | | | |
| **Did not request ATAR** | 2,621 | 241 | 2,862 | 39.32 | 64.44 | 40.65 |
| **Request ATAR** | 4,045 | 133 | 4,178 | 60.68 | 35.56 | 59.35 |
| **Total** | **6,666** | **374** | **7,040** | **100.00** | **100.00** | **100.00** |

**Table 9: ATAR score request by Indigenous status, LSAY, Population weighted**

| Received an ATAR (pop weighted) based on the students left in the sample in 2009/2012 | | | | | | |
|---|---|---|---|---|---|---|
| | Non Indigenous | Indigenous | Total | Non Indigenous | Indigenous | Total |
| | No. | No. | No. | % | % | % |
| **2006** | | | | | | |
| **Did not request ATAR** | 53,514 | 1,952 | 55,465 | 40.73 | 68.03 | 41.32 |
| **Request ATAR** | 77,858 | 917 | 78,775 | 59.27 | 31.97 | 58.68 |
| **Total** | **131,371** | **2,869** | **134,240** | **100.00** | **100.00** | **100.00** |
| **2009** | | | | | | |
| **Did not request ATAR** | 44,945 | 1,712 | 46,658 | 37.57 | 67.44 | 38.19 |
| **Request ATAR** | 74,686 | 827 | 75,513 | 62.43 | 32.56 | 61.81 |
| **Total** | **119,631** | **2,539** | **122,170** | **100.00** | **100.00** | **100.00** |

### 4.2.4 Intention to go to University and university participation

Table 10 (sample statistics) and Table 11 (population weighted) show the proportions of students who stated their intention to go to University after high school.

**Table 10: Intention to go to university by Indigenous status, LSAY, Population weighted**

| Intention to study at University (sample statistics) students left in the sample in 2009/2012 | | | | | | |
|---|---|---|---|---|---|---|
| | Non Indigenous | Indigenous | Total | Non Indigenous | Indigenous | Total |
| | No. | No. | No. | % | % | % |
| **2006** | | | | | | |
| **No** | 3,123 | 252 | 3,375 | 40.40 | 61.61 | 41.46 |
| **Yes** | 4,608 | 157 | 4,765 | 59.60 | 38.39 | 58.54 |
| **Total** | **7,731** | **409** | **8,140** | **100.00** | **100.00** | **100.00** |
| **2009** | | | | | | |
| **No** | 4,031 | 300 | 4,331 | 52.28 | 69.77 | 53.20 |
| **Yes** | 3,680 | 130 | 3,810 | 47.72 | 30.23 | 46.80 |
| **Total** | **7,711** | **430** | **8,141** | **100.00** | **100.00** | **100.00** |

**Table 11: Intention to go to university by Indigenous status, LSAY, Population weighted**

| Intention to study at University (population weighted) students left in the sample in 2009/2012 | Non Indigenous | Indigenous | Total | Non Indigenous | Indigenous | Total |
|---|---|---|---|---|---|---|
| | No. | No. | No. | % | % | % |
| **2006** | | | | | | |
| **No** | 52,662 | 1,738 | 54,400 | 39.12 | 63.81 | 39.61 |
| **Yes** | 81,960 | 986 | 82,946 | 60.88 | 36.19 | 60.39 |
| **Total** | **134,622** | **2,724** | **137,346** | **100.00** | **100.00** | **100.00** |
| **2009** | | | | | | |
| **No** | 68,590 | 2,149 | 70,740 | 49.65 | 72.92 | 50.14 |
| **Yes** | 69,551 | 798 | 70,349 | 50.35 | 27.08 | 49.86 |
| **Total** | **138,142** | **2,947** | **141,089** | **100.00** | **100.00** | **100.00** |

Table 12 (sample statistics) and Table 13 (population weighted) present the proportion of people who actually go to university in the few years observed by the LSAY after completing Year 12. These statistics must be treated with caution since we look at this outcome up to three years after the PISA first wave, knowing that a proportion of students may not have as yet completed high school and others may have taken a gap year.

**Table 12: University participation or completion by Indigenous status, LSAY**

| University participation or completion (sample statistics) students left in the sample in 2009/2012 | Non Indigenous | Indigenous | Total | Non Indigenous | Indigenous | Total |
|---|---|---|---|---|---|---|
| | No. | No. | No. | % | % | % |
| **2006** | | | | | | |
| **No** | 4,906 | 355 | 5,261 | 65.13 | 84.12 | 66.13 |
| **Yes** | 2,627 | 67 | 2,694 | 34.87 | 15.88 | 33.87 |
| **Total** | **7,533** | **422** | **7,955** | **100.00** | **100.00** | **100.00** |
| **2009** | | | | | | |
| **No** | 4,023 | 320 | 4,343 | 60.35 | 85.56 | 61.69 |
| **Yes** | 2,643 | 54 | 2,697 | 39.65 | 14.44 | 38.31 |
| **Total** | **6,666** | **374** | **7,040** | **100.00** | **100.00** | **100.00** |

**Table 13: University participation or completion by Indigenous status, LSAY, population weighted**

| University participation or completion (pop weighted) students left in the sample in 2009/2012 | | | | | | |
|---|---|---|---|---|---|---|
| | Non Indigenous | Indigenous | Total | Non Indigenous | Indigenous | Total |
| | No. | No. | No. | % | % | % |
| **2006** | | | | | | |
| **No** | 83,774 | 2,439 | 86,213 | 63.77 | 85.03 | 64.22 |
| **Yes** | 47,597 | 430 | 48,027 | 36.23 | 14.97 | 35.78 |
| **Total** | **131,371** | **2,869** | **134,240** | **100.00** | **100.00** | **100.00** |
| **2009** | | | | | | |
| **No** | 69,273 | 2,189 | 71,462 | 57.91 | 86.21 | 58.49 |
| **Yes** | 50,358 | 350 | 50,708 | 42.09 | 13.79 | 41.51 |
| **Total** | **119,631** | **2,539** | **122,170** | **100.00** | **100.00** | **100.00** |

### 4.2.5 Participate or complete TAFE qualification (at Certificate III or above)

Table 14 (sample statistics) and Table 15 (population weighted) show the proportion of students attending TAFE (Cert III and above). Similar to University participation, these statistics will under-represent the number of students choosing this path since not all have completed their high school within the three year sampling frame we use while others may undertake TAFE later in life.

**Table 14: TAFE (Cert. III or above) participation or completion by Indigenous status, LSAY**

| TAFE (Cert III or above) participation or completion (sample statistics), based on the students left in the sample in 2009/2012 | | | | | | |
|---|---|---|---|---|---|---|
| | Non Indigenous | Indigenous | Total | Non Indigenous | Indigenous | Total |
| | No. | No. | No. | % | % | % |
| **2006** | | | | | | |
| **No** | 6,067 | 340 | 6,407 | 80.54 | 80.57 | 80.54 |
| **Yes** | 1,466 | 82 | 1,548 | 19.46 | 19.43 | 19.46 |
| **Total** | **7,533** | **422** | **7,955** | **100.00** | **100.00** | **100.00** |
| **2009** | | | | | | |
| **No** | 5,464 | 298 | 5,762 | 81.97 | 79.68 | 81.85 |
| **Yes** | 1,202 | 76 | 1,278 | 18.03 | 20.32 | 18.15 |
| **Total** | **6,666** | **374** | **7,040** | **100.00** | **100.00** | **100.00** |

**Table 15: TAFE (Cert. III or above) participation or completion by Indigenous status, LSAY, population weighted**

| TAFE (Cert III or above) participation or completion (pop weighted), ), based on the students left in the sample in 2009/2012 | | | | | | |
|---|---|---|---|---|---|---|
| | Non Indigenous | Indigenous | Total | Non Indigenous | Indigenous | Total |
| | No. | No. | No. | % | % | % |
| **2006** | | | | | | |
| **No** | 105,139 | 2,112 | 107,251 | 80.03 | 73.62 | 79.89 |
| **Yes** | 26,232 | 757 | 26,989 | 19.97 | 26.38 | 20.11 |
| **Total** | **131,371** | **2,869** | **134,240** | **100.00** | **100.00** | **100.00** |
| **2009** | | | | | | |
| **No** | 97,410 | 1,973 | 99,383 | 81.43 | 77.68 | 81.35 |
| **Yes** | 22,221 | 567 | 22,787 | 18.57 | 22.32 | 18.65 |
| **Total** | **119,631** | **2,539** | **122,170** | **100.00** | **100.00** | **100.00** |

## 4.3 Multivariate modelling of students' education pathways accounting for past outcomes: how do Indigenous students actually fare?

### 4.3.1 Methodology of the estimations

We use the LSAY data to estimate a number of probabilistic models, each corresponding to one of several outcomes along the student education pathways described in the previous section. Full estimation results are available in the appendices (Appendix B to Appendix F). The model results we present correspond to estimations pooling both 2006 and 2009 cohorts of students.

We use a cohort indicator variable to look at whether education outcomes significantly differ between the two cohorts, that is, after the multivariate method of our analysis has controlled for all other observable information. Following Equation (1) we also use an Indigenous status variable to test whether Indigenous students significantly differ from non-Indigenous students (everything else held constant) with regards to the outcomes considered. We also include an interaction between Indigenous status and cohort in order to test whether the outcomes of interest have significantly changed for Indigenous students between the 2006 and the 2009 cohorts.

We pay particular attention to these variables as they are central to our analysis of differences between Indigenous and non-Indigenous students over time. Another set of variables of particular interest for us are those related to the students' PISA achievements obtained three years earlier. We include the estimated (fixed part) PISA score along with the estimated school quality in the estimations.

The aim of using this method is to twofold. First, we use it to enable us to look in a formal statistical way at the degree to which a student's standardised test scores performance extends to educational outcomes further down the track. Second, we expect that some of the other determinants of further educational outcomes along the education pathways we investigate will have commonalities of impact with the standardized test scores that are worth knowing. There is a danger of potential confounding and double counting, which may be of consequence in policy terms. In this sense, it becomes relevant to distinguish, among all determinants of further outcomes, between those that have a direct effect, those that

have an indirect effect through the PISA test scores and those that compound a direct effect over and above their influence on the PISA scores. One factor that is particularly of interest to us and is a good example to illustrate this issue is the socio economic status of the parents of a student. Parental socioeconomic status influence on test scores is well documented in the literature. Our methodology enables us to distinguish between the degree to which parental socioeconomic status will influence test scores and through test scores influence outcomes such as Year 12 completion and the degree to which parental socioeconomic status will influence Year 12 completion directly (that is over and above the indirect influence through test scores). Our method enables us to identify and quantify these different relationships.

The general form of our model assumes that a number of variables that are related to a given educational outcome also determine the student's standardised test scores occurring up to 3 years prior to the outcome of interest. Following the Education literature, we posit a direct relationship between performance of students in the PISA tests and their subsequent educational outcomes.

If a given educational outcome of interest is independent from the PISA test scores, then we can write the latent outcome (seen as the propensity of the outcome arising) as a function of individual students' characteristics and school characteristics.

$$D_i^* = f(X_i, Z_i)$$

$$\begin{cases} D_i = 1 \text{ if outcome occurs} \\ D_i = 0 \text{ otherwise} \end{cases}$$

The educational outcomes of interest for our analysis are, respectively, the probability that students:

(i) drop out of school,
(ii) complete year 12,
(iii) request an ATAR,
(iv) intend to go to university
(v) go to university
(vi) go to TAFE (cert III or higher)

Each of these outcomes is binary.

$D_i^*$ stands for the latent (unobserved) student *i's* propensity of a given outcome and $D_i$ , the observable counterpart assuming value 1 if the student is observed with the outcome equal to 1 (for instance, equal 1 if an individual is observed dropping out of school and 0 if not). $X_i$ stands for a vector of individual characteristics and $Z_i$ for a vector of school characteristics that are assumed to be related to the outcome of interest.

In the context of such a model, the total effect of a change in a variable belonging to *X* (or *Z*) on the probability to drop out would be defined as $\frac{df(X\ ,Z\ )}{dx} = \frac{\partial f(X\ ,Z\ )}{\partial x} dx$

Our model goes further and assumes a more general form, allowing for a relationship between PISA scores and further educational outcomes and incorporating the fact that PISA scores are endogenously determined. In other words PISA scores are also a function of some of the variables *x* and *z* included in the model on educational outcome. The model can therefore be written as follows.

$$D_i^* = f(X_i, Z_i, Score_i)$$

$$\text{with } Score_i = s\left(X_i^S, Z_i^S\right)$$

Where $Score_i$ represents the PISA score achievement of individual *i,* which itself is a function of a vector of individual characteristics, $X_i^S$, and school characteristics, $Z_i^S$. These two vectors include variables that are common with $X_i$ and $Z_i$ so that $X_i^S \cap X_i \neq \emptyset$ and $Z_i^S \cap Z_i \neq \emptyset$.
As a consequence, the effect of a change in the value of a variable *x* on the probability that a given educational outcome is 1 can be decomposed between a direct effect and an indirect effect through the PISA scores:

$$\frac{df(X\ ,Z\ )}{dx} = \frac{\partial f(X\ ,Z\ )}{\partial x}dx + \frac{\partial f(X\ ,Z\ )}{\partial S} \cdot \frac{\partial S}{\partial x}dx$$

Practically, the implementation of the general form of the model requires that one takes into account the endogeneity of the PISA scores explicitly. We do so by implementing a two equations model whereby the PISA scores are explicitly estimated and subsequently used as regressors in the model of interest. The model becomes:

$$D_i^* = \beta X_i + \gamma Z_i + \alpha \widehat{Score}_i + u_i$$

$$\begin{cases} D_i = 1 \text{ if } D_i^* > 0 \\ D_i = 0 \text{ otherwise} \end{cases}$$

Where $\widehat{Score}_i$ stands for the estimated standardised test score of individual *i* obtained through the specification defined above in the multilevel PISA score estimation (see paragraph 3.1.1):

$$Score_i = \beta^S X_i + \gamma^S Z_i + u_j + u_i^S$$

Using the multilevel structure for the estimation of PISA scores that are subsequently used in the estimation of further educational outcomes allows us to test the hypothesis that 'school quality' may affect these outcomes over and above the effect it has on students' PISA scores.
Altogether we estimate the following model:

$$D_i^* = \beta X_i + \gamma Z_i + \alpha \widehat{Score}_i + u_i$$

$$\begin{cases} D_i = 1 \text{ if } D_i^* > 0 \\ D_i = 0 \text{ otherwise} \end{cases}$$

$$\widehat{Score}_i = \hat{\beta}^S X_i + \hat{\gamma}^S Z_i + \hat{u}_j$$

We estimate two nested models for each outcome, one where we add State dummies controlling for State specificities and another specification which does not include States. The number of observations of Indigenous students in some states is fairly limited and can potentially create estimation problems, by providing the results on both specifications we can assure ourselves that any robustness problems will be identified.

In addition to the model results on each educational outcome we carry out decompositions in order to investigate in more detail the outcome gap (that is, the raw gap between the outcomes of Indigenous and non-Indigenous students). We use similar techniques to those introduced in section 3.2 with the difference that the techniques used are adapted to the non-linear nature of the models estimated to determine educational outcomes. More specifically, we decompose the raw (observed) gap in the outcome between Indigenous and non-Indigenous students, into a characteristics and a coefficients component. This 'Endowment' component is estimated from the individual characteristics differences and the 'Returns' component from the coefficients differences.

The full decomposition showing the contribution of each variable is contained in the respective appendices.

# 5. APPENDIX TABLES

## 5.1 Appendix A: PISA scores

**Table A1: Multilevel estimations of PISA scores**

| Variables | Reading | Math | Science |
|---|---|---|---|
| **Age (deviation from population mean)** | **22.6*** ** | **24.4*** ** | **27.5*** ** |
| | (2.25) | (2.09) | (2.42) |
| **Male** | **-36.6*** ** | **14.8*** ** | **0.52** |
| | (1.46) | (1.36) | (1.58) |
| **Mother did not complete year 12** | **-2.67*** | **-3.05** ** | **-5.89*** ** |
| | (1.45) | (1.35) | (1.56) |
| **Father did not complete year 12** | **-11.4*** ** | **-10.2*** ** | **-8.95*** ** |
| | (1.48) | (1.38) | (1.60) |
| **Father blue collar** | **-2.71*** | **-4.14*** ** | **-5.94*** ** |
| | (1.46) | (1.36) | (1.58) |
| **Mother blue collar** | **-8.14*** ** | **-6.17*** ** | **-7.95*** ** |
| | (2.10) | (1.96) | (2.27) |
| **Books 0-25 (reference: more than 100 books)** | **-40.2*** ** | **-39.0*** ** | **-50.5*** ** |
| | (1.94) | (1.81) | (2.10) |
| **Books 26-100 (reference: more than 100 books)** | **-19.2*** ** | **-18.5*** ** | **-24.8*** ** |
| | (1.52) | (1.41) | (1.64) |
| **No quiet place to study** | **-10.8*** ** | **-9.71*** ** | **-10.1*** ** |
| | (2.13) | (1.98) | (2.30) |
| **Minutes of class time reading per week** | **0.0067** | **-0.041*** ** | **-0.030*** ** |
| | (0.0078) | (0.0072) | (0.0084) |
| **Minutes of class time maths per week** | **0.044*** ** | **0.072*** ** | **0.056*** ** |
| | (0.0079) | (0.0073) | (0.0085) |
| **Minutes of class time science per week** | **0.082*** ** | **0.088*** ** | **0.12*** ** |
| | (0.0055) | (0.0051) | (0.0059) |
| **Minutes of class time reading per week (school level)** | **-0.092*** | **-0.020** | **-0.072** |
| | (0.053) | (0.053) | (0.055) |
| **Minutes of class time maths per week (school level)** | **0.073** | **0.024** | **0.029** |
| | (0.058) | (0.057) | (0.061) |
| **Minutes of class time science per week (school level)** | **-0.042** | **-0.0085** | **0.027** |
| | (0.031) | (0.031) | (0.032) |
| **Student ESCS** | **11.2*** ** | **8.86*** ** | **9.95*** ** |
| | (1.20) | (1.12) | (1.29) |
| **School ESCS** | **29.1*** ** | **25.2*** ** | **24.3*** ** |
| | (5.62) | (5.56) | (5.89) |
| **Male times School ESCS** | **12.8*** ** | **7.87** ** | **11.5*** ** |
| | (3.75) | (3.52) | (4.04) |
| **2009 cohort * Age (deviation from mean)** | **-3.92** | **-5.31*** | **-8.02** ** |
| | (3.35) | (3.12) | (3.61) |
| **2009 cohort * Male** | **-1.62** | **-3.03** | **0.10** |
| | (2.46) | (2.29) | (2.65) |
| **2009 cohort * Mother did not complete Y12** | **-3.25** | **-1.12** | **-0.072** |
| | (2.18) | (2.03) | (2.35) |
| **2009 cohort * Father did not complete Y12** | **4.42** ** | **2.97** | **3.11** |
| | (2.21) | (2.06) | (2.38) |

| | | | |
|---|---|---|---|
| **2009 cohort * Father blue collar** | **-2.53** | **0.72** | **1.54** |
| | (2.23) | (2.08) | (2.41) |
| **2009 cohort * Mother blue collar** | **5.51** | **7.81**** | **5.12** |
| | (3.35) | (3.13) | (3.62) |
| **2009 cohort * Books 0-25** | **-9.57***** | **-8.73***** | **-1.63** |
| | (2.92) | (2.72) | (3.15) |
| **2009 cohort * Books26_100** | **-3.56** | **-4.73**** | **0.16** |
| | (2.28) | (2.12) | (2.46) |
| **2009 cohort * No quiet place to study** | **-1.75** | **-2.77** | **-2.25** |
| | (3.22) | (3.00) | (3.47) |
| **2009 cohort * Minutes of class time reading per week** | **-0.11***** | **-0.070***** | **-0.075***** |
| | (0.017) | (0.016) | (0.019) |
| **2009 cohort * Minutes of class time maths per week** | **0.016** | **-0.0081** | **0.0039** |
| | (0.016) | (0.015) | (0.017) |
| **2009 cohort * Minutes of class time science per week** | **-0.019*** | **-0.011** | **-0.043***** |
| | (0.010) | (0.0094) | (0.011) |
| **2009 cohort * Minutes of class time reading per week (school)** | **0.080** | **0.031** | **0.15** |
| | (0.100) | (0.098) | (0.10) |
| **2009 cohort * Minutes of class time maths per week (school)** | **-0.13** | **-0.033** | **-0.11** |
| | (0.11) | (0.10) | (0.11) |
| **2009 cohort * Minutes of class time science per week (school)** | **0.10*** | **0.057** | **0.036** |
| | (0.055) | (0.054) | (0.057) |
| **2009 cohort * Student ESCS** | **3.24*** | **6.26***** | **6.09***** |
| | (1.82) | (1.70) | (1.97) |
| **2009 cohort * School ESCS** | **10.7** | **16.7**** | **21.4**** |
| | (8.12) | (8.02) | (8.51) |
| **2009 cohort * Male *School ESCS** | **0.42** | **-3.59** | **-2.66** |
| | (5.52) | (5.18) | (5.94) |
| **2009 cohort dummy** | **18.7** | **4.19** | **2.99** |
| | (14.4) | (14.3) | (15.0) |
| **Indigenous** | **-42.2***** | **-37.2***** | **-44.3***** |
| | (2.61) | (2.43) | (2.81) |
| **2009 cohort * Indigenous** | **14.9***** | **14.8***** | **16.9***** |
| | (4.00) | (3.73) | (4.32) |
| **Computers per students (school)** | **0.89** | **16.2** | **11.3** |
| | (10.3) | (10.2) | (10.7) |
| **Shortage of qualified teacher (school)** | **3.42** | **3.90** | **2.22** |
| | (3.16) | (3.15) | (3.28) |
| **Student/teacher ratio (school)** | **0.20** | **0.29** | **0.26** |
| | (0.55) | (0.55) | (0.58) |
| **Constant pressure from parents about academic performance** | **8.38***** | **5.83*** | **8.87***** |
| | (3.19) | (3.19) | (3.32) |
| **2009 cohort * computers per student** | **34.0**** | **28.0*** | **9.69** |
| | (16.8) | (16.8) | (17.5) |
| **2009 cohort * shortage qualified teacher** | **1.33** | **1.17** | **1.63** |
| | (4.34) | (4.33) | (4.51) |
| **2009 cohort * student/teacher ratio** | **0.61** | **0.40** | **0.029** |
| | (0.90) | (0.89) | (0.94) |
| **2009 cohort * Constant pressure from parents about academic performance** | **1.02** | **6.72** | **-0.94** |
| | (4.70) | (4.69) | (4.89) |

| | | | |
|---|---|---|---|
| **Percentage funding by government (school)** | **-0.16** | **-0.070** | **0.069** |
| | (0.17) | (0.17) | (0.18) |
| **2009 cohort * Percentage funding by government (school)** | **0.086** | **-0.31** | **-0.53*** |
| | (0.30) | (0.30) | (0.31) |
| **Percentage funding through fees** | **-0.033** | **0.13** | **0.16** |
| | (0.20) | (0.20) | (0.21) |
| **2009 cohort * percentage funding through fees** | **-0.17** | **-0.65*** | **-0.82**** |
| | (0.34) | (0.33) | (0.35) |
| **Constant** | **527***** | **498***** | **518***** |
| | (8.74) | (8.71) | (9.11) |
| **Ln $\sigma_u$** | **3.09***** | **3.11***** | **3.12***** |
| | (0.037) | (0.036) | (0.038) |
| **Ln $\sigma_e$** | **4.27***** | **4.20***** | **4.35***** |
| | (0.0047) | (0.0047) | (0.0047) |
| **Observations** | 23,661 | 23,661 | 23,661 |
| **Number of groups** | 689 | 689 | 689 |
| **ll** | -135126 | -133486 | -136918 |
| **ll_c** | -135659 | -134162 | -137395 |
| **chi2** | 6952 | 6143 | 6061 |
| **p** | 0 | 0 | 0 |

**Table A2: Full decomposition results, PISA reading scores.**

| Decomposition results for each variables of the model (Explained) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Variables** | **E(D=0)** | **C** | **CE** | **1** | **0.5** | **0.971** | **pooled** |
| **Age (deviation from population mean)** | 0.66 | 0.39 | -0.32 | 0.34 | 0.50 | 0.35 | 0.35 |
| **Male** | -0.41 | -3.39 | -0.09 | -0.50 | -0.46 | -0.50 | -0.49 |
| **Mother did not complete year 12** | 0.14 | -2.23 | 0.69 | 0.83 | 0.49 | 0.81 | 0.75 |
| **Father did not complete year 12** | 2.55 | -0.70 | 0.21 | 2.76 | 2.66 | 2.76 | 2.82 |
| **Father blue collar** | -1.67 | -9.72 | 2.17 | 0.50 | -0.58 | 0.44 | 0.34 |
| **Mother blue collar** | 0.29 | -0.57 | 0.18 | 0.46 | 0.37 | 0.46 | 0.44 |
| **Books 0-25 (reference: more than 100 books)** | 4.97 | -6.71 | 3.71 | 8.68 | 6.83 | 8.58 | 8.65 |
| **Books 26-100 (reference: more than 100 books)** | -0.02 | -4.89 | -0.07 | -0.09 | -0.05 | -0.09 | -0.09 |
| **No quiet place to study** | 0.99 | 0.15 | -0.08 | 0.91 | 0.95 | 0.91 | 0.93 |
| **Minutes of class time reading per week** | -0.88 | 11.19 | 1.34 | 0.46 | -0.21 | 0.42 | 0.40 |
| **Minutes of class time maths per week** | 6.68 | -36.06 | -5.61 | 1.07 | 3.87 | 1.22 | 1.34 |
| **Minutes of class time science per week** | 3.50 | -0.86 | -0.19 | 3.31 | 3.41 | 3.32 | 3.35 |
| **Minutes of class time reading per week (school level)** | -5.42 | 60.54 | 4.05 | -1.37 | -3.39 | -1.48 | -1.44 |
| **Minutes of class time maths per week (school level)** | 4.81 | -61.81 | -4.53 | 0.29 | 2.55 | 0.41 | 0.59 |
| **Minutes of class time science per week (school level)** | -3.40 | 33.24 | 3.27 | -0.14 | -1.77 | -0.23 | -0.31 |
| **Student ESCS** | 13.23 | 8.61 | -9.43 | 3.81 | 8.52 | 4.06 | 4.64 |
| **School ESCS** | 7.00 | 0.02 | -0.19 | 6.81 | 6.91 | 6.82 | 7.57 |
| **Male times School ESCS** | 1.26 | -0.35 | 2.95 | 4.21 | 2.73 | 4.12 | 3.89 |
| **2009 cohort * Age (deviation from mean)** | -0.27 | -0.27 | 0.22 | -0.04 | -0.16 | -0.05 | -0.04 |
| **2009 cohort * Male** | -0.28 | 2.09 | 0.28 | 0.00 | -0.14 | -0.01 | -0.01 |
| **2009 cohort * Mother did not complete Y12** | 0.59 | 1.31 | -0.39 | 0.20 | 0.39 | 0.21 | 0.25 |
| **2009 cohort * Father did not complete Y12** | -0.03 | 1.11 | -0.28 | -0.32 | -0.18 | -0.31 | -0.31 |
| **2009 cohort * Father blue collar** | 0.09 | 0.28 | -0.05 | 0.04 | 0.06 | 0.04 | 0.06 |
| **2009 cohort * Mother blue collar** | -0.17 | -0.10 | 0.03 | -0.14 | -0.16 | -0.14 | -0.14 |
| **2009 cohort * Books 0-25** | 3.81 | 5.73 | -3.23 | 0.58 | 2.20 | 0.67 | 0.75 |
| **2009 cohort * Books26_100** | -0.10 | 4.82 | 0.10 | 0.00 | -0.05 | -0.01 | -0.01 |
| **2009 cohort * No quiet place to study** | -0.07 | -0.42 | 0.19 | 0.12 | 0.03 | 0.11 | 0.12 |
| **2009 cohort * Minutes of class time reading per week** | 0.14 | -12.93 | -0.99 | -0.85 | -0.36 | -0.82 | -0.83 |
| **2009 cohort * Minutes of class time maths per week** | -2.00 | 18.21 | 2.17 | 0.17 | -0.92 | 0.11 | 0.09 |
| **2009 cohort * Minutes of class time science per week** | -0.61 | 3.13 | 0.51 | -0.10 | -0.35 | -0.11 | -0.11 |
| **2009 cohort * Minutes of class time reading per week (school)** | 1.03 | -10.27 | -0.78 | 0.25 | 0.64 | 0.27 | 0.28 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **2009 cohort * Minutes of class time maths per week (school)** | 0.87 | -19.84 | -1.72 | -0.85 | 0.01 | -0.81 | -0.88 |
| **2009 cohort * Minutes of class time science per week (school)** | -0.12 | 16.51 | 1.29 | 1.16 | 0.52 | 1.13 | 1.14 |
| **2009 cohort * Student ESCS** | -3.81 | -4.23 | 5.19 | 1.38 | -1.21 | 1.24 | 1.05 |
| **2009 cohort * School ESCS** | 2.72 | -0.15 | -0.71 | 2.01 | 2.37 | 2.03 | 1.89 |
| **2009 cohort * Male *School ESCS** | 0.62 | -0.20 | -1.26 | -0.64 | -0.01 | -0.61 | -0.52 |
| **2009 cohort dummy** | 0.99 | -10.41 | -0.80 | 0.19 | 0.59 | 0.22 | 0.33 |
| **Computers per students (school)** | 0.80 | 1.26 | -0.83 | -0.04 | 0.38 | -0.02 | -0.02 |
| **Shortage of qualified teacher (school)** | 2.84 | -4.28 | -2.56 | 0.28 | 1.56 | 0.35 | 0.35 |
| **Student/teacher ratio (school)** | 0.52 | 0.15 | -0.43 | 0.09 | 0.31 | 0.10 | 0.16 |
| **Constant pressure from parents about academic performance** | 0.15 | 1.67 | 1.06 | 1.21 | 0.68 | 1.18 | 1.19 |
| **2009 cohort * computers per student** | -1.10 | 1.01 | 0.77 | -0.33 | -0.71 | -0.35 | -0.34 |
| **2009 cohort * shortage qualified teacher** | -0.78 | 1.45 | 0.92 | 0.14 | -0.32 | 0.11 | 0.12 |
| **2009 cohort * student/teacher ratio** | 0.16 | 0.01 | -0.03 | 0.13 | 0.15 | 0.13 | 0.15 |
| **2009 cohort * Constant pressure from parents about academic performance** | 0.22 | -0.43 | -0.31 | -0.09 | 0.06 | -0.08 | -0.10 |
| **Percentage funding by government (school)** | 2.73 | -0.23 | 0.25 | 2.97 | 2.85 | 2.97 | 2.79 |
| **2009 cohort * Percentage funding by government (school)** | -3.72 | -2.00 | 2.29 | -1.43 | -2.58 | -1.50 | -1.48 |
| **Percentage funding through fees** | 1.07 | 2.90 | -3.13 | -2.06 | -0.50 | -1.98 | -1.83 |
| **2009 cohort * percentage funding through fees** | 5.36 | 4.52 | -5.10 | 0.26 | 2.81 | 0.40 | 0.38 |
| **Constant** | 0.00 | 49.55 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Total** | **45.91** | **36.78** | **-9.29** | **36.62** | **41.27** | **36.87** | **38.18** |

## 5.2 Appendix B: the probability to drop out of school

**Table B1: full model of the probability of dropping out from school, 2006 and 2009 pooled**

| . | (1) | | (2) | |
|---|---|---|---|---|
| | **Coef.** | **M.E.** | **Coef.** | **M.E.** |
| Wave 2009 | **-0.197*** ** | **-0.039*** ** | **-0.181*** ** | **-0.035*** ** |
| | (0.047) | (0.009) | (0.045) | (0.009) |
| Indigenous | **-0.212** | **-0.038** | **-0.181** | **-0.032** |
| | (0.153) | (0.024) | (0.148) | (0.024) |
| Wave 2009*Indigenous | **0.048** | **0.010** | **0.015** | **0.003** |
| | (0.148) | (0.031) | (0.150) | (0.030) |
| Age | **0.104** | **0.021** | **0.070** | **0.014** |
| | (0.082) | (0.017) | (0.081) | (0.016) |
| Male | **-0.076** | **-0.015** | **-0.013** | **-0.003** |
| | (0.105) | (0.021) | (0.102) | (0.020) |
| Mother university education | **-0.154*** ** | **-0.030*** ** | **-0.152*** ** | **-0.029*** ** |
| | (0.053) | (0.010) | (0.054) | (0.010) |
| Father university education | **-0.224*** ** | **-0.043*** ** | **-0.237*** ** | **-0.044*** ** |
| | (0.055) | (0.010) | (0.056) | (0.010) |
| Mother TAFE education | **0.031** | **0.006** | **0.028** | **0.006** |
| | (0.038) | (0.008) | (0.039) | (0.008) |
| Father TAFE education | **0.016** | **0.003** | **0.021** | **0.004** |
| | (0.039) | (0.008) | (0.040) | (0.008) |
| Mother did not complete year 12 | **0.114*** ** | **0.023*** ** | **0.127*** ** | **0.025*** ** |
| | (0.043) | (0.009) | (0.043) | (0.009) |
| Father did not complete year 12 | **0.120** ** | **0.024*** ** | **0.125** ** | **0.025*** ** |
| | (0.050) | (0.010) | (0.049) | (0.010) |
| Mother blue collar | **-0.120** ** | **-0.023*** ** | **-0.104* ** | **-0.020* ** |
| | (0.056) | (0.009) | (0.058) | (0.010) |
| Father blue collar | **0.081** ** | **0.017** ** | **0.091** ** | **0.018** ** |
| | (0.041) | (0.008) | (0.042) | (0.008) |
| Books 0-25 (reference: more than 100 books) | **-0.139** | **-0.026** | **-0.042** | **-0.008** |
| | (0.134) | (0.024) | (0.131) | (0.025) |
| Books 26-100 (reference: more than 100 books) | **-0.072** | **-0.014** | **-0.023** | **-0.005** |
| | (0.070) | (0.013) | (0.070) | (0.014) |
| Students does not have a desk | **0.272*** ** | **0.062*** ** | **0.260*** ** | **0.058*** ** |
| | (0.063) | (0.016) | (0.063) | (0.016) |
| No quiet place to study | **-0.052** | **-0.010** | **-0.036** | **-0.007** |
| | (0.064) | (0.012) | (0.063) | (0.012) |
| No internet at home | **0.296*** ** | **0.069*** ** | **0.269*** ** | **0.061*** ** |
| | (0.066) | (0.018) | (0.067) | (0.017) |
| Student ESCS | **0.138** ** | **0.028** ** | **0.124** ** | **0.024** |
| | (0.055) | (0.011) | (0.054) | (0.011) |
| School average ESCS | **0.178** | **0.036** | **0.033** | **0.006** |
| | (0.141) | (0.028) | (0.142) | (0.028) |
| School quality (estimated) | **-0.007*** ** | **-0.001*** ** | **-0.005*** ** | **-0.001*** ** |
| | (0.001) | (0.000) | (0.001) | (0.000) |
| fixedpart_readuse | **-0.011*** ** | **-0.002*** ** | **-0.010*** ** | **-0.002*** ** |
| | (0.003) | (0.000) | (0.003) | (0.001) |
| Minutes of class time reading per week | **0.000** | **0.000** | **-0.000** | **0.000** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| Minutes of class time maths per week | **0.000** | **-0.000** | **0.000** | **-0.000** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| Minutes of class time science per week | **0.000** | **0.000** | **0.000** | **0.000** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| Computers per student | **-0.166** | **-0.033** | **0.011** | **0.002** |
| | (0.193) | (0.039) | (0.184) | (0.036) |

| | | | | |
|---|---|---|---|---|
| Shortage of qualifies teachers | **-0.028** | **-0.006** | **-0.033** | **-0.007** |
| | (0.051) | (0.010) | (0.049) | (0.009) |
| Students/teacher ratio | **0.021**** | **0.004**** | **0.022***** | **0.004***** |
| | (0.009) | (0.002) | (0.008) | (0.002) |
| Constant pressure from parents about academic performance | **-0.010** | **-0.002** | **0.023** | **0.005** |
| | (0.055) | (0.011) | (0.052) | (0.010) |
| School provides info to parents on their child's performance relative to other year 9 students in the school | **0.011** | **0.002** | **-0.043** | **-0.008** |
| | (0.045) | (0.009) | (0.042) | (0.008) |
| School provides info to parents on their child's performance relative to regional or national benchmarks | **0.138***** | **0.028***** | **0.068** | **0.013** |
| | (0.050) | (0.010) | (0.052) | (0.010) |
| School provides info to parents on their child's performance relative to other year 9 students in other schools | **0.033** | **0.007** | **-0.061** | **-0.012** |
| | (0.058) | (0.012) | (0.058) | (0.011) |
| Government school (reference: Catholic school) | **0.188***** | **0.037***** | **0.189***** | **0.037***** |
| | (0.060) | (0.012) | (0.056) | (0.011) |
| Independent school (reference: Catholic school) | **-0.102** | **-0.020** | **-0.022** | **-0.004** |
| | (0.079) | (0.015) | (0.076) | (0.015) |
| NSW (reference: ACT) | | | **-0.162*** | **-0.030*** |
| | | | (0.093) | (0.016) |
| VIC (reference: ACT) | | | **-0.450***** | **-0.073***** |
| | | | (0.101) | (0.013) |
| QLD (reference: ACT) | | | **-0.660***** | **-0.100***** |
| | | | (0.099) | (0.011) |
| SA (reference: ACT) | | | **-0.371***** | **-0.061***** |
| | | | (0.091) | (0.012) |
| WA (reference: ACT) | | | **-0.262**** | **-0.046**** |
| | | | (0.108) | (0.016) |
| TAS (reference: ACT) | | | **0.110** | **0.023** |
| | | | (0.101) | (0.022) |
| NT (reference: ACT) | | | **-0.183** | **-0.033*** |
| | | | (0.121) | (0.019) |
| Constant | **4.665***** | | **4.173***** | |
| | (1.518) | | (1.470) | |
| Observations | 9666 | | | 9,666 |
| Log pseudolikelihood | -3616.033 | | | -3539.788 |
| Pseudo R2 | 0.159 | | | 0.177 |

Note: ***p<.01; **p<.5; *p<.1. Standard errors are reported in parenthesis.

**Table B2: Decomposition of the difference in probability of dropping out from school between non-Indigenous and Indigenous students**

| | Model (1) | | Model (2) | |
|---|---|---|---|---|
| **Raw gap** | **Characteristics** | **Coefficients** | **Characteristics** | **Coefficients** |
| **-0.153*** ** | -0.221*** | 0.056 | -0.209*** | 0.054 |
| **(0.018)** | (0.029) | (0.037) | (0.029) | (0.037) |
| **Detailed decomposition:** | | | | |
| **cohort 2009** | **-0.001*** ** | **-0.036** | **-0.001*** ** | **-0.029** |
| | (0.000) | (0.028) | (0.000) | (0.027) |
| **Age** | **0.0003** | **0.001** | **0.000** | **0.002** |
| | (0.000) | (0.002) | (0.000) | (0.001) |
| **Male** | **-0.0003*** ** | **0.108** ** | **0.000** | **0.090** ** |
| | (0.001) | (0.049) | (0.001) | (0.045) |
| **Mother university education** | **-0.004*** ** | **0.003** | **-0.004*** ** | **-0.003** |
| | (0.001) | (0.012) | (0.001) | (0.011) |
| **Father university education** | **-0.010*** ** | **-0.005** | **-0.011*** ** | **-0.004** |
| | (0.003) | (0.010) | (0.002) | (0.009) |
| **Mother TAFE education** | **-0.0004** | **0.007** | **-0.000** | **0.009** |
| | (0.000) | (0.015) | (0.000) | (0.013) |
| **Father TAFE education** | **-0.0001** | **0.004** | **-0.000** | **-0.001** |
| | (0.000) | (0.015) | (0.000) | (0.014) |
| **Mother did not complete year 12** | **-0.005*** ** | **-0.010** | **-0.005*** ** | **-0.003** |
| | (0.002) | (0.027) | (0.002) | (0.025) |
| **Father did not complete year 12** | **-0.006*** ** | **0.003** | **-0.006*** ** | **0.005** |
| | (0.002) | (0.038) | (0.002) | (0.035) |
| **Mother blue collar** | **0.001** ** | **0.001** | **0.001* ** | **0.004** |
| | (0.001) | (0.009) | (0.001) | (0.008) |
| **Father blue collar** | **-0.002** ** | **0.016** | **-0.003** ** | **0.008** |
| | (0.001) | (0.023) | (0.001) | (0.021) |
| **Books 0-25 (reference: more than 100 books)** | **0.004** ** | **0.073* ** | **0.000** | **0.049** |
| | (0.005) | (0.043) | (0.005) | (0.041) |
| **Books 26-100 (reference: more than 100 books)** | **0.0002** | **0.031** | **0.000** | **0.025** |
| | (0.000) | (0.023) | (0.000) | (0.021) |
| **Students does not have a desk** | **-0.008*** ** | **-0.002** | **-0.007** ** | **-0.007** |
| | (0.002) | (0.010) | (0.002) | (0.009) |
| **No quiet place to study** | **0.001** | **0.007** | **0.001** | **0.001** |
| | (0.001) | (0.011) | (0.001) | (0.010) |
| **No internet at home** | **-0.016*** ** | **0.022* ** | **-0.014*** ** | **0.020** |
| | (0.003) | (0.013) | (0.003) | (0.013) |
| **Student ESCS** | **0.015*** ** | **0.013** | **0.013** ** | **0.005** |
| | (0.006) | (0.023) | (0.006) | (0.021) |
| **School average ESCS** | **0.015*** ** | **-0.010* ** | **0.000** | **-0.007** |
| | (0.006) | (0.005) | (0.001) | (0.005) |
| **Estimated school quality** | **0.009** | **-0.001** | **-0.002*** ** | **-0.000** |
| | (0.008) | (0.001) | (0.000) | (0.001) |
| **Estimated PISA score (fixed part)** | **-0.184*** ** | **-0.007** | **-0.156*** ** | **1.924** |
| | (0.048) | (0.008) | (0.047) | (1.176) |
| **Minutes of class time reading per week** | **0.002** | **0.008** | **0.002** | **-0.007** |

| | | | | |
|---|---|---|---|---|
| | (0.002) | (0.010) | (0.002) | (0.007) |
| **Minutes of class time maths per week** | **-0.002** | **0.008** | **-0.002** | **0.007** |
| | (0.003) | (0.010) | (0.002) | (0.009) |
| **Minutes of class time science per week** | **0.002*** ** | **0.019** ** | **-0.001** | **0.014*** |
| | (0.002) | (0.008) | (0.002) | (0.008) |
| **Computers per student** | **-0.0003** | **0.002** ** | **-0.000** | **0.002** ** |
| | (0.000) | (0.001) | (0.000) | (0.001) |
| **Shortage of qualifies teachers** | **-0.001** | **0.001** | **-0.001** | **0.008** |
| | (0.002) | (0.011) | (0.002) | (0.010) |
| **Students/teacher ratio** | **-0.0002** ** | **-0.008*** | **-0.0002** ** | **-0.037*** ** |
| | (0.000) | (0.005) | (0.000) | (0.013) |
| **Constant pressure from parents about academic performance** | **-0.001** | **-0.034*** ** | **-0.0001** | **-0.037*** ** |
| | (0.001) | (0.013) | (0.001) | (0.013) |
| **School provides info to parents on their child's performance relative to other year 9 students in the school** | **0.0002** | **0.010** | **-0.001** | **0.014** |
| | (0.001) | (0.025) | (0.001) | (0.025) |
| **School provides info to parents on their child's performance relative to regional or national benchmarks** | **0.003*** ** | **-0.018** | **0.002*** | **0.011** |
| | (0.001) | (0.017) | (0.001) | (0.018) |
| **School provides info to parents on their child's performance relative to other year 9 students in other schools** | **0.0001** | **-0.010** | **-0.0004** | **-0.004** |
| | (0.000) | (0.010) | (0.000) | (0.009) |
| **Government school (reference: Catholic school)** | **-0.012*** ** | **-0.017** | **-0.011*** ** | **-0.044** |
| | (0.003) | (0.052) | (0.003) | (0.049) |
| **Independent school (reference: Catholic school)** | **-0.004** | **-0.0004** | **-0.001** | **-0.004** |
| | (0.002) | (0.006) | (0.002) | (0.005) |
| **NSW (reference: ACT)** | | | **-0.001*** | **0.019** |
| | | | (0.000) | (0.024) |
| **VIC (reference: ACT)** | | | **-0.016*** ** | **0.002** |
| | | | (0.003) | (0.004) |
| **QLD (reference: ACT)** | | | **0.021*** ** | **0.062*** |
| | | | (0.003) | (0.032) |
| **SA (reference: ACT)** | | | **-0.007*** ** | **0.004** |
| | | | (0.002) | (0.006) |
| **WA (reference: ACT)** | | | **-0.001*** ** | **0.013** |
| | | | (0.000) | (0.011) |
| **TAS (reference: ACT)** | | | **-0.001** | **0.007** |
| | | | (0.001) | (0.015) |
| **NT (reference: ACT)** | | | **0.003** | **0.034** ** |
| | | | (0.003) | (0.016) |
| **Constant** | | **-2.523*** | | **-2.127** |
| | | (1.395) | | (1.310) |

Note: ***p<.01; **p<.5; *p<.1. Standard errors are reported in parenthesis. The raw gap may not be exactly equal to the sum of characteristics effect and coefficient effect due to the nonlinear nature of the decomposition.

## 5.3 Appendix C: The probability of year 12 completion

**Table C1: Full model of the probability of completing year 12, (pooled 2006 and 2009)**

| | (1) | | (2) | |
|---|---|---|---|---|
| | **Coef.** | **M.E.** | **Coef.** | **M.E.** |
| **Wave 2009** | **-0.116**** | **-0.029**** | **-0.129***** | **-0.031***** |
| | (0.049) | (0.012) | (0.046) | (0.011) |
| **Indigenous** | **-0.112** | **-0.029** | **-0.168** | **-0.044** |
| | (0.143) | (0.039) | (0.146) | (0.040) |
| **Wave 2009*Indigenous** | **0.142** | **0.033** | **0.168** | **0.037** |
| | (0.138) | (0.029) | (0.138) | (0.028) |
| **Age** | **0.551***** | **0.136***** | **0.601***** | **0.145***** |
| | (0.085) | (0.021) | (0.087) | (0.021) |
| **Male** | **-0.164*** | **-0.041** | **-0.230**** | **-0.056**** |
| | (0.099) | (0.025) | (0.101) | (0.025) |
| **Mother university education** | **0.096**** | **0.023**** | **0.094**** | **0.022**** |
| | (0.045) | (0.011) | (0.046) | (0.011) |
| **Father university education** | **0.121**** | **0.029**** | **0.146***** | **0.034***** |
| | (0.051) | (0.012) | (0.051) | (0.012) |
| **Mother TAFE education** | **-0.028** | **-0.008** | **-0.032** | **-0.008** |
| | (0.035) | (0.009) | (0.036) | (0.009) |
| **Father TAFE education** | **-0.011** | **-0.003** | **-0.016** | **-0.004** |
| | (0.039) | (0.010) | (0.039) | (0.009) |
| **Mother did not complete year 12** | **-0.109***** | **-0.027***** | **-0.118***** | **-0.029***** |
| | (0.039) | (0.010) | (0.039) | (0.010) |
| **Father did not complete year 12** | **-0.166***** | **-0.041***** | **-0.170***** | **-0.041***** |
| | (0.047) | (0.012) | (0.048) | (0.012) |
| **Mother blue collar** | **0.071** | **0.017** | **0.066** | **0.015** |
| | (0.054) | (0.012) | (0.055) | (0.013) |
| **Father blue collar** | **-0.068*** | **-0.017*** | **-0.074*** | **-0.018*** |
| | (0.039) | (0.012) | (0.040) | (0.010) |
| **Books 0-25 (reference: more than 100 books)** | **-0.075** | **-0.019** | **-0.196** | **-0.051** |
| | (0.125) | (0.032) | (0.128) | (0.035) |
| **Books 26-100 (reference: more than 100 books)** | **-0.002** | **-0.001** | **-0.064** | **-0.016** |
| | (0.064) | (0.016) | (0.066) | (0.016) |
| **Students does not have a desk** | **-0.225***** | **-0.061***** | **-0.211***** | **-0.056***** |
| | (0.064) | (0.019) | (0.064) | (0.018) |
| **No quiet place to study** | **0.006** | **0.001** | **-0.014** | **-0.003** |
| | (0.059) | (0.015) | (0.060) | (0.015) |
| **No internet at home** | **-0.343***** | **-0.097***** | **-0.309***** | **-0.085***** |
| | (0.066) | (0.021) | (0.067) | (0.021) |
| **Student ESCS** | **-0.040** | **-0.010** | **-0.022** | **-0.005** |
| | (0.051) | (0.012) | (0.050) | (0.012) |
| **School average ESCS** | **-0.009** | **-0.002** | **0.107** | **0.026** |
| | (0.129) | (0.032) | (0.136) | (0.033) |
| **School quality estimated** | **0.008***** | **0.002***** | **0.006***** | **0.001***** |
| | (0.001) | (0.000) | (0.001) | (0.000) |
| **fixedpart_readuse** | **0.005*** | **0.001*** | **0.003** | **0.001** |
| | (0.003) | (0.001) | (0.003) | (0.001) |
| **Minutes of class time reading per week** | **0.000** | **-0.0001** | **-0.000** | **-0.000** |

| | | | | |
|---|---|---|---|---|
| | (0.000) | (0.000) | (0.000) | (0.000) |
| **Minutes of class time maths per week** | **0.000** | **0.0001** | **0.000*** | **0.000*** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| **Minutes of class time science per week** | **0.000*** | **0.0001*** | **0.001***** | **0.000** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| **Computers per student** | **0.552***** | **0.136***** | **0.321*** | **0.077*** |
| | (0.196) | (0.048) | (0.185) | (0.044) |
| **Shortage of qualifies teachers** | **0.007** | **0.002** | **0.038** | **0.009** |
| | (0.049) | (0.012) | (0.046) | (0.011) |
| **Students/teacher ratio** | **-0.003** | **-0.001** | **-0.003** | **-0.000** |
| | (0.009) | (0.002) | (0.009) | (0.000) |
| **Constant pressure from parents about academic performance** | **0.076** | **0.019** | **0.039** | **0.009** |
| | (0.054) | (0.013) | (0.052) | (0.012) |
| **School provides info to parents on their child's performance relative to other year 9 students in the school** | **0.060** | **0.015** | **0.052** | **0.013** |
| | (0.047) | (0.012) | (0.045) | (0.011) |
| **School provides info to parents on their child's performance relative to regional or national benchmarks** | **-0.194***** | **-0.048***** | **-0.045** | **-0.011** |
| | (0.050) | (0.013) | (0.051) | (0.012) |
| **School provides info to parents on their child's performance relative to other year 9 students in other schools** | **-0.097** | **-0.025** | **-0.013** | **-0.003** |
| | (0.060) | (0.016) | (0.063) | (0.015) |
| **Government school (reference: Catholic school)** | **-0.149***** | **-0.036***** | **-0.172***** | **-0.041***** |
| | (0.057) | (0.014) | (0.054) | (0.013) |
| **Independent school (reference: Catholic school)** | **0.021** | **0.005** | **-0.046** | **-0.011** |
| | (0.083) | (0.020) | (0.082) | (0.020) |
| **NSW (reference: ACT)** | | | **-0.009** | **-0.002** |
| | | | (0.083) | (0.020) |
| **VIC (reference: ACT)** | | | **0.041** | **0.010** |
| | | | (0.100) | (0.024) |
| **QLD (reference: ACT)** | | | **0.575***** | **0.114***** |
| | | | (0.086) | (0.013) |
| **SA (reference: ACT)** | | | **0.218***** | **0.048***** |
| | | | (0.085) | (0.017) |
| **WA (reference: ACT)** | | | **0.207**** | **0.046**** |
| | | | (0.100) | (0.020) |
| **TAS (reference: ACT)** | | | **-0.450***** | **-0.129***** |
| | | | (0.089) | (0.029) |
| **NT (reference: ACT)** | | | **0.131** | **0.030** |
| | | | (0.121) | (0.026) |
| **Constant** | **-1.152** | | **-0.343** | |
| | (1.416) | | (1.464) | |
| **Observations** | 9666 | | | 9,666 |
| **Log pseudolikelihood** | -4160.656 | | | -4045.661 |
| **Pseudo R2** | 0.132 | | | 0.156 |

Note: ***p<.01; **p<.5; *p<.1. Standard errors are reported in parenthesis.

**Table C2: Decomposition of the difference in probability of completing year 12 between non-Indigenous and Indigenous students**

| | Model (1) | | Model (2) | |
|---|---|---|---|---|
| **Raw gap** | **Characteristics effect** | **Coefficient effect** | **Characteristics effect** | **Coefficient effect** |
| **0.154*** ** | 0.145*** | 0.012 | 0.120*** | 0.023 |
| **(0.019)** | (0.027) | (0.036) | (0.026) | (0.034) |
| **Detailed decomposition:** | | | | |
| **Cohort 2009** | -0.0003*** | 0.049 | -0.0003*** | 0.057 |
| | (0.0001) | (0.630) | (0.0001) | (0.355) |
| **Age** | 0.002*** | -0.006 | 0.002*** | -0.009 |
| | (0.000) | (0.074) | (0.000) | (0.052) |
| **Male** | -0.002** | -0.550 | -0.003*** | -0.462 |
| | (0.001) | (6.848) | (0.001) | (2.615) |
| **Mother university education** | 0.002* | -0.070 | 0.002* | -0.036 |
| | (0.001) | (0.890) | (0.001) | (0.219) |
| **Father university education** | 0.006*** | 0.043 | 0.007*** | 0.036 |
| | (0.002) | (0.536) | (0.002) | (0.211) |
| **Mother TAFE education** | 0.0004 | -0.013 | 0.000 | -0.041 |
| | (0.000) | (0.182) | (0.000) | (0.247) |
| **Father TAFE education** | 0.0001 | -0.064 | 0.000 | -0.022 |
| | (0.000) | (0.808) | (0.000) | (0.151) |
| **Mother did not complete year 12** | 0.005*** | 0.043 | 0.005*** | -0.017 |
| | (0.002) | (0.568) | (0.002) | (0.175) |
| **Father did not complete year 12** | 0.008*** | 0.153 | 0.008*** | 0.107 |
| | (0.002) | (1.955) | (0.002) | (0.665) |
| **Mother blue collar** | -0.001 | 0.042 | -0.001 | 0.027 |
| | (0.001) | (0.534) | (0.001) | (0.163) |
| **Father blue collar** | 0.002** | -0.049 | 0.002** | -0.011 |
| | (0.001) | (0.615) | (0.002) | (0.130) |
| **Books 0-25 (reference: more than 100 books)** | 0.005 | -0.396 | 0.010** | -0.258 |
| | (0.005) | (4.928) | (0.005) | (1.461) |
| **Books 26-100 (reference: more than 100 books)** | 0.0001 | -0.083 | 0.000 | -0.055 |
| | (0.000) | (1.034) | (0.000) | (0.320) |
| **Students does not have a desk** | 0.007*** | 0.006 | 0.006*** | 0.035 |
| | (0.002) | (0.093) | (0.002) | (0.210) |
| **No quiet place to study** | -0.0002 | -0.021 | 0.000 | 0.012 |
| | (0.002) | (0.262) | (0.002) | (0.095) |
| **No internet at home** | 0.018*** | -0.123 | 0.016*** | -0.091 |
| | (0.004) | (1.555) | (0.003) | (0.531) |
| **Student ESCS** | -0.003 | -0.142 | -0.001 | -0.091 |
| | (0.006) | (1.784) | (0.005) | (0.531) |
| **School average ESCS** | 0.002 | 0.044 | 0.009 | 0.029 |
| | (0.008) | (0.544) | (0.008) | (0.165) |
| **Estimated school quality** | 0.003*** | 0.003 | 0.002*** | 0.003 |
| | (0.000) | (0.040) | (0.000) | (0.016) |
| **Estimated PISA score (fixed part)** | 0.073* | -12.367 | 0.042 | -9.976 |
| | (0.042) | (153.67) | (0.042) | (56.259) |

| | | | | |
|---|---|---|---|---|
| **Minutes of class time reading per week** | -0.003 | 0.097 | -0.003 | 0.087 |
| | (0.002) | (1.206) | (0.002) | (0.495) |
| **Minutes of class time maths per week** | 0.004 | -0.073 | 0.005* | -0.065 |
| | (0.003) | (0.907) | (0.002) | (0.368) |
| **Minutes of class time science per week** | 0.006*** | -0.121 | 0.007*** | -0.085 |
| | (0.002) | (1.515) | (0.002) | (0.479) |
| **Computers per student** | 0.001*** | -0.009 | 0.001 | -0.010 |
| | (0.000) | (0.114) | (0.000) | (0.059) |
| **Shortage of qualifies teachers** | 0.001 | 0.036 | 0.002 | -0.010 |
| | (0.002) | (0.457) | (0.002) | (0.079) |
| **Students/teacher ratio** | -0.000 | 0.072 | -0.000 | 0.070 |
| | (0.000) | (0.902) | (0.000) | (0.402) |
| **Constant pressure from parents about academic performance** | 0.002** | 0.158 | 0.001 | 0.195 |
| | (0.001) | (1.973) | (0.001) | (1.115) |
| **School provides info to parents on their child's performance relative to other year 9 students in the school** | 0.002 | -0.118 | 0.001 | -0.224 |
| | (0.001) | (1.490) | (0.001) | (1.290) |
| **School provides info to parents on their child's performance relative to regional or national benchmarks** | -0.004*** | 0.076 | -0.001 | -0.107 |
| | (0.001) | (0.959) | (0.001) | (0.615) |
| **School provides info to parents on their child's performance relative to other year 9 students in other schools** | -0.001** | 0.009 | -0.000 | -0.038 |
| | (0.000) | (0.132) | (0.000) | (0.223) |
| **Government school (reference: Catholic school)** | 0.010*** | 0.112 | 0.011*** | 0.285 |
| | (0.003) | (1.444) | (0.003) | (1.668) |
| **Independent school (reference: Catholic school)** | 0.001 | -0.002 | -0.002 | 0.030 |
| | (0.002) | (0.040) | (0.002) | (0.176) |
| **NSW (reference: ACT)** | | | -0.000 | -0.116 |
| | | | (0.000) | (0.674) |
| **VIC (reference: ACT)** | | | 0.001 | -0.028 |
| | | | (0.003) | (0.164) |
| **QLD (reference: ACT)** | | | -0.019*** | -0.455 |
| | | | (0.003) | (2.622) |
| **SA (reference: ACT)** | | | 0.004** | -0.034 |
| | | | (0.002) | (0.199) |
| **WA (reference: ACT)** | | | 0.001** | -0.094 |
| | | | (0.000) | (0.544) |
| **TAS (reference: ACT)** | | | 0.006*** | -0.062 |
| | | | (0.001) | (0.366) |
| **NT (reference: ACT)** | | | -0.002 | -0.239 |
| | | | (0.003) | (1.372) |
| **Constant** | | 13.277 | | 11.685 |
| | | (164.77) | | (65.768) |

## 5.4 Appendix D: probability of ATAR request

**Table D1 : Full model of the probability of requesting an ATAR, pooled 2006 and 2009**

| | (1) | | (2) | |
|---|---|---|---|---|
| | **Coef.** | **M.E.** | **Coef.** | **M.E.** |
| **Wave 2009** | **0.083**** | **0.031**** | **0.081**** | **0.031**** |
| | (0.041) | (0.015) | (0.038) | (0.014) |
| **Indigenous** | **0.130** | **0.048** | **0.093** | **0.035** |
| | (0.143) | (0.052) | (0.145) | (0.053) |
| **Wave 2009*Indigenous** | **-0.038** | **-0.015** | **0.014** | **0.005** |
| | (0.141) | (0.054) | (0.142) | (0.054) |
| **Age** | **0.509***** | **0.194***** | **0.552***** | **0.210***** |
| | (0.079) | (0.030) | (0.081) | (0.031) |
| **Male** | **-0.017** | **-0.006** | **-0.074** | **-0.028** |
| | (0.085) | (0.032) | (0.083) | (0.032) |
| **Mother university education** | **0.162***** | **0.061***** | **0.157***** | **0.059***** |
| | (0.038) | (0.014) | (0.039) | (0.014) |
| **Father university education** | **0.205***** | **0.077***** | **0.211***** | **0.079***** |
| | (0.045) | (0.017) | (0.046) | (0.017) |
| **Mother TAFE education** | **-0.059*** | **-0.023*** | **-0.062*** | **-0.024*** |
| | (0.031) | (0.012) | (0.032) | (0.012) |
| **Father TAFE education** | **0.055** | **0.021** | **0.048** | **0.018** |
| | (0.035) | (0.013) | (0.036) | (0.013) |
| **Mother did not complete year 12** | **-0.007** | **-0.002** | **-0.019** | **-0.007** |
| | (0.034) | (0.013) | (0.034) | (0.013) |
| **Father did not complete year 12** | **-0.050** | **-0.019** | **-0.055** | **-0.021** |
| | (0.041) | (0.016) | (0.042) | (0.016) |
| **Mother blue collar** | **0.094*** | **0.035*** | **0.078** | **0.029** |
| | (0.049) | (0.018) | (0.049) | (0.018) |
| **Father blue collar** | **-0.047** | **-0.018*** | **-0.045** | **-0.017** |
| | (0.034) | (0.010) | (0.035) | (0.013) |
| **Books 0-25 (reference: more than 100 books)** | **0.150** | **0.056** | **0.065** | **0.025** |
| | (0.109) | (0.040) | (0.110) | (0.041) |
| **Books 26-100 (reference: more than 100 books)** | **0.069** | **0.026** | **0.027** | **0.010** |
| | (0.059) | (0.022) | (0.060) | (0.023) |
| **Students does not have a desk** | **-0.235***** | **-0.092***** | **-0.222***** | **-0.086***** |
| | (0.063) | (0.025) | (0.063) | (0.025) |
| **No quiet place to study** | **-0.024** | **-0.009** | **-0.037** | **-0.014** |
| | (0.057) | (0.022) | (0.057) | (0.022) |
| **No internet at home** | **-0.320***** | **-0.125***** | **-0.284***** | **-0.111***** |
| | (0.072) | (0.029) | (0.073) | (0.029) |
| **Student ESCS** | **-0.056** | **-0.021** | **-0.034** | **-0.013** |
| | (0.045) | (0.017) | (0.045) | (0.017) |
| **School average ESCS** | **-0.212*** | **-0.081*** | **-0.087** | **-0.033** |
| | (0.115) | (0.044) | (0.114) | (0.043) |
| **School quality estimated** | **0.007***** | **0.003***** | **0.007***** | **0.003***** |
| | (0.001) | (0.000) | (0.001) | (0.000) |
| **fixedpart_readuse** | **0.010***** | **0.004***** | **0.009***** | **0.003***** |
| | (0.002) | (0.001) | (0.002) | (0.001) |
| **Minutes of class time reading per week** | **-0.001***** | **-0.000***** | **-0.001***** | **-0.000***** |

| | | | | |
|---|---|---|---|---|
| | (0.000) | (0.000) | (0.000) | (0.000) |
| **Minutes of class time maths per week** | **0.000** | **0.000** | **0.000*** | **0.000*** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| **Minutes of class time science per week** | **0.000**** | **0.000**** | **0.001***** | **0.000***** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| **Computers per student** | **-0.233** | **-0.089** | **-0.134** | **0.051** |
| | (0.150) | (0.057) | (0.157) | (0.060) |
| **Shortage of qualifies teachers** | **0.031** | **0.012** | **0.022** | **0.008** |
| | (0.043) | (0.016) | (0.040) | (0.015) |
| **Students/teacher ratio** | **0.003** | **0.001** | **0.008** | **0.003** |
| | (0.009) | (0.004) | (0.008) | (0.003) |
| **Constant pressure from parents about academic performance** | **0.046** | **0.012** | **0.020** | **0.008** |
| | (0.046) | (0.016) | (0.044) | (0.017) |
| **School provides info to parents on their child's performance relative to other year 9 students in the school** | **-0.025** | **-0.009** | **0.001** | **0.001** |
| | (0.040) | (0.015) | (0.038) | (0.015) |
| **School provides info to parents on their child's performance relative to regional or national benchmarks** | **-0.049** | **-0.019** | **-0.052** | **-0.020** |
| | (0.042) | (0.016) | (0.043) | (0.016) |
| **School provides info to parents on their child's performance relative to other year 9 students in other schools** | **-0.124**** | **-0.048**** | **-0.013** | **-0.005** |
| | (0.053) | (0.021) | (0.053) | (0.020) |
| **Government school (reference: Catholic school)** | **-0.258***** | **-0.098***** | **-0.261***** | **-0.098***** |
| | (0.051) | (0.019) | (0.047) | (0.018) |
| **Independent school (reference: Catholic school)** | **-0.051** | **-0.019** | **-0.106*** | **-0.041*** |
| | (0.065) | (0.025) | (0.063) | (0.024) |
| **NSW (reference: ACT)** | | | **0.339***** | **0.124***** |
| | | | (0.071) | (0.025) |
| **VIC (reference: ACT)** | | | **0.529***** | **0.186***** |
| | | | (0.083) | (0.026) |
| **QLD (reference: ACT)** | | | **0.534***** | **0.188***** |
| | | | (0.072) | (0.023) |
| **SA (reference: ACT)** | | | **0.402***** | **0.143***** |
| | | | (0.073) | (0.024) |
| **WA (reference: ACT)** | | | **0.104** | **0.039** |
| | | | (0.079) | (0.029) |
| **TAS (reference: ACT)** | | | **-0.195**** | **-0.076**** |
| | | | (0.078) | (0.031) |
| **NT (reference: ACT)** | | | **0.410***** | **0.144***** |
| | | | (0.098) | (0.031) |
| **Constant** | **-4.857***** | | **-4.498***** | |
| | (1.277) | | (1.302) | |
| **Observations** | 9666 | | | 9,666 |
| **Log pseudolikelihood** | -5519.792 | | | -5401.009 |
| **Pseudo R2** | 0.149 | | | 0.168 |

Note: ***p<.01; **p<.5; *p<.1. Standard errors are reported in parenthesis.

**Table D2: Decomposition of the difference in probability of requesting an ATAR between non-Indigenous and Indigenous students**

| | Model (1) | | Model (2) | |
|---|---|---|---|---|
| **Raw gap** | **Characteristics** | **Coefficients** | **Characteristics** | **Coefficients** |
| **0.212*** ** | 0.255*** | -0.037 | 0.246*** | -0.033 |
| **(0.023)** | (0.022) | (0.030) | (0.022) | (0.030) |
| **Detailed decomposition:** | | | | |
| **Wave 2009** | 0.0003*** | 0.060 | 0.0003*** | 0.120 |
| | (0.0001) | (0.051) | (0.000) | (0.209) |
| **Age** | 0.002*** | 0.0004 | 0.003*** | -0.001 |
| | (0.000) | (0.002) | (0.000) | (0.005) |
| **Male** | -0.0003 | -0.064 | -0.001 | -0.107 |
| | (0.001) | (0.084) | (0.001) | (0.229) |
| **Mother university education** | 0.005*** | -0.034 | 0.005*** | -0.057 |
| | (0.001) | (0.022) | (0.001) | (0.092) |
| **Father university education** | 0.011*** | 0.013 | 0.012*** | 0.021 |
| | (0.002) | (0.015) | (0.002) | (0.041) |
| **Mother TAFE education** | 0.001** | -0.019 | 0.001** | -0.049 |
| | (0.000) | (0.023) | (0.000) | (0.087) |
| **Father TAFE education** | -0.0001 | -0.013 | -0.0001 | -0.018 |
| | (0.000) | (0.022) | (0.000) | (0.047) |
| **Mother did not complete year 12** | 0.0003 | -0.013 | 0.001 | -0.048 |
| | (0.002) | (0.041) | (0.002) | (0.107) |
| **Father did not complete year 12** | 0.003 | 0.055 | 0.003 | 0.072 |
| | (0.002) | (0.059) | (0.002) | (0.145) |
| **Mother blue collar** | -0.001* | -0.020 | -0.001 | -0.044 |
| | (0.001) | (0.018) | (0.001) | (0.077) |
| **Father blue collar** | 0.002 | -0.019 | 0.002 | -0.029 |
| | (0.002) | (0.037) | (0.001) | (0.083) |
| **Books 0-25 (reference: more than 100)** | -0.007 | -0.077 | -0.003 | -0.128 |
| | (0.005) | (0.081) | (0.005) | (0.252) |
| **Books 26-100 (reference: more than 100)** | -0.0003 | -0.034 | -0.0001 | -0.062 |
| | (0.000) | (0.041) | (0.000) | (0.125) |
| **Students does not have a desk** | 0.009*** | -0.011 | 0.008*** | -0.011 |
| | (0.002) | (0.017) | (0.002) | (0.033) |
| **No quiet place to study** | 0.001 | -0.0003 | 0.001 | 0.007 |
| | (0.001) | (0.018) | (0.001) | (0.034) |
| **No internet at home** | 0.020*** | -0.042 | 0.018*** | -0.070 |
| | (0.004) | (0.027) | (0.004) | (0.112) |
| **Student ESCS** | -0.007 | -0.014 | -0.004 | -0.011 |
| | (0.006) | (0.034) | (0.006) | (0.064) |
| **School average ESCS** | -0.019** | -0.010 | -0.009 | -0.024 |
| | (0.008) | (0.009) | (0.008) | (0.040) |
| **Estimated school quality** | 0.003*** | -0.0004 | 0.003*** | -0.001 |
| | (0.000) | (0.001) | (0.000) | (0.002) |
| **Estimated PISA score (fixed part)** | 0.210*** | -1.916 | 0.181*** | -3.418 |
| | (0.042) | (2.333) | (0.042) | (7.069) |
| **Minutes of class time reading per week** | -0.006*** | 0.012 | -0.006*** | 0.025 |
| | (0.002) | (0.014) | (0.002) | (0.046) |

| | | | | |
|---|---|---|---|---|
| **Minutes of class time maths per week** | 0.004 | 0.004 | 0.005* | 0.006 |
| | (0.003) | (0.016) | (0.003) | (0.030) |
| **Minutes of class time science per week** | 0.006*** | -0.022 | 0.008*** | -0.037 |
| | (0.002) | (0.017) | (0.002) | (0.065) |
| **Computers per student** | -0.0003* | -0.002 | -0.0001 | -0.005 |
| | (0.000) | (0.002) | (0.001) | (0.008) |
| **Shortage of qualifies teachers** | 0.002 | 0.004 | 0.001 | -0.019 |
| | (0.002) | (0.016) | (0.002) | (0.043) |
| **Students/teacher ratio** | -0.000 | 0.016 | -0.0001 | 0.036 |
| | (0.000) | (0.0.011) | (0.000) | (0.059) |
| **Constant pressure from parents about academic performance** | 0.002* | 0.047 | 0.001 | 0.100 |
| | (0.001) | (0.032) | (0.001) | (0.166) |
| **School provides info to parents on their child's performance relative to other year 9 students in the school** | -0.001 | -0.034 | -0.0001 | -0.107 |
| | (0.001) | (0.041) | (0.001) | (0.185) |
| **School provides info to parents on their child's performance relative to regional or national benchmarks** | -0.001 | -0.006 | -0.002* | -0.098 |
| | (0.001) | (0.026) | (0.001) | (0.165) |
| **School provides info to parents on their child's performance relative to other year 9 students in other schools** | -0.001*** | -0.009 | -0.0001 | -0.025 |
| | (0.000) | (0.016) | (0.000) | (0.048) |
| **Government school (reference: Catholic school)** | 0.020*** | -0.067 | 0.020*** | -0.078 |
| | (0.003) | (0.078) | (0.003) | (0.183) |
| **Independent school (reference: Catholic school)** | -0.002 | -0.007 | -0.004** | 0.001 |
| | (0.002) | (0.008) | (0.002) | (0.014) |
| **NSW (reference: ACT)** | | | 0.002*** | -0.019 |
| | | | (0.000) | (0.079) |
| **VIC (reference: ACT)** | | | 0.024*** | -0.013 |
| | | | (0.003) | (0.026) |
| **QLD (reference: ACT)** | | | -0.021*** | -0.175 |
| | | | (0.003) | (0.297) |
| **SA (reference: ACT)** | | | 0.009*** | -0.008 |
| | | | (0.002) | (0.022) |
| **WA (reference: ACT)** | | | 0.0004 | -0.039 |
| | | | (0.000) | (0.070) |
| **TAS (reference: ACT)** | | | 0.003 | -0.027 |
| | | | (0.001) | (0.062) |
| **NT (reference: ACT)** | | | -0.012*** | -0.093 |
| | | | (0.003) | (0.156) |
| **Constant** | | 2.184 | | 4.401 |
| | | (2.629) | | (8.754) |

Note: ***p<.01; **p<.5; *p<.1. Standard errors are reported in parenthesis. The raw gap may not be exactly equal to the sum of characteristics effect and coefficient effect due to the nonlinear nature of the decomposition.

## 5.5 Appendix E: the intention to go to university

**Table E1: full model of the probability of intending to go to university, pooled 2006 and 2009**

| | (1) | | (2) | |
|---|---|---|---|---|
| | **Coef.** | **M.E.** | **Coef.** | **M.E.** |
| **Wave 2009** | **-0.334*** ** | **-0.132*** ** | **-0.340*** ** | **-0.134*** ** |
| | (0.041) | (0.016) | (0.039) | (0.015) |
| **Indigenous** | **-0.059** | **-0.024** | **-0.008** | **-0.003** |
| | (0.129) | (0.051) | (0.123) | (0.049) |
| **Wave 2009*Indigenous** | **-0.062** | **-0.025** | **-0.041** | **-0.016** |
| | (0.130) | (0.052) | (0.129) | (0.051) |
| **Age** | **-0.065** | **-0.026** | **-0.081** | **-0.032** |
| | (0.066) | (0.026) | (0.063) | (0.025) |
| **Male** | **-0.143*** | **-0.057*** | **-0.143*** | **-0.057*** |
| | (0.080) | (0.032) | (0.074) | (0.029) |
| **Mother university education** | **0.125*** ** | **0.049*** ** | **0.127*** ** | **0.050*** ** |
| | (0.036) | (0.014) | (0.036) | (0.014) |
| **Father university education** | **0.143*** ** | **0.056*** ** | **0.139*** ** | **0.055*** ** |
| | (0.042) | (0.016) | (0.043) | (0.017) |
| **Mother TAFE education** | **0.048** | **0.019** | **0.050** | **0.020** |
| | (0.032) | (0.013) | (0.033) | (0.013) |
| **Father TAFE education** | **-0.036** | **-0.014** | **-0.040** | **-0.013** |
| | (0.030) | (0.012) | (0.030) | (0.012) |
| **Mother did not complete year 12** | **-0.029** | **-0.012** | **-0.034** | **-0.013** |
| | (0.032) | (0.013) | (0.032) | (0.012) |
| **Father did not complete year 12** | **-0.024** | **-0.010** | **-0.023** | **-0.009** |
| | (0.040) | (0.016) | (0.040) | (0.016) |
| **Mother blue collar** | **0.030** | **0.012** | **0.023** | **0.009** |
| | (0.044) | (0.017) | (0.044) | (0.017) |
| **Father blue collar** | **-0.055*** | **-0.022*** | **-0.051** | **-0.020** |
| | (0.033) | (0.013) | (0.033) | (0.013) |
| **Books 0-25 (reference: more than 100 books)** | **0.096** | **0.038** | **0.116** | **0.046** |
| | (0.110) | (0.043) | (0.105) | (0.041) |
| **Books 26-100 (reference: more than 100 books)** | **0.055** | **0.022** | **0.062** | **0.025** |
| | (0.057) | (0.023) | (0.055) | (0.022) |
| **Students does not have a desk** | **-0.178*** ** | **-0.071*** ** | **-0.176*** ** | **-0.070*** ** |
| | (0.058) | (0.023) | (0.059) | (0.023) |
| **No quiet place to study** | **-0.036** | **-0.014** | **-0.029** | **-0.012** |
| | (0.053) | (0.021) | (0.053) | (0.021) |
| **No internet at home** | **-0.220*** ** | **-0.087*** ** | **-0.207*** ** | **-0.082*** ** |
| | (0.069) | (0.027) | (0.069) | (0.027) |
| **Student ESCS** | **0.040** | **0.016** | **0.035** | **0.014** |
| | (0.040) | (0.016) | (0.039) | (0.015) |
| **School average ESCS** | **0.010** | **0.004** | **0.100** | **0.040** |
| | (0.111) | (0.044) | (0.112) | (0.044) |
| **School quality estimated** | **0.005*** ** | **0.002*** ** | **0.005*** ** | **0.002*** ** |
| | (0.001) | (0.000) | (0.001) | (0.000) |
| **fixedpart_readuse** | **0.004** | **0.001** | **0.004*** | **0.002*** |
| | (0.002) | (0.001) | (0.002) | (0.001) |
| **Minutes of class time reading per week** | **-0.001*** ** | **-0.000*** ** | **-0.001*** ** | **-0.000*** ** |

| | | | | |
|---|---|---|---|---|
| | (0.000) | (0.000) | (0.000) | (0.000) |
| **Minutes of class time maths per week** | **0.001**** | **0.000**** | **0.000*** | **0.000*** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| **Minutes of class time science per week** | **0.001***** | **0.000***** | **0.001***** | **0.000***** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| **Computers per student** | **0.329**** | **0.130**** | **0.464***** | **0.183***** |
| | (0.139) | (0.055) | (0.145) | (0.057) |
| **Shortage of qualifies teachers** | **0.126***** | **0.050***** | **0.090**** | **0.036**** |
| | (0.039) | (0.015) | (0.038) | (0.015) |
| **Students/teacher ratio** | **0.017** | **0.007** | **0.019*** | **0.008*** |
| | (0.012) | (0.005) | (0.011) | (0.004) |
| **Constant pressure from parents about academic performance** | **0.067** | **0.026** | **0.037** | **0.015** |
| | (0.048) | (0.019) | (0.044) | (0.017) |
| **School provides info to parents on their child's performance relative to other year 9 students in the school** | **0.003** | **0.001** | **0.064** | **0.025** |
| | (0.041) | (0.016) | (0.039) | (0.016) |
| **School provides info to parents on their child's performance relative to regional or national benchmarks** | **0.128***** | **0.050***** | **0.020** | **0.008** |
| | (0.040) | (0.016) | (0.041) | (0.016) |
| **School provides info to parents on their child's performance relative to other year 9 students in other schools** | **-0.042** | **-0.017** | **0.029** | **0.011** |
| | (0.051) | (0.020) | (0.047) | (0.019) |
| **Government school (reference: Catholic school)** | **-0.114**** | **-0.045**** | **-0.092**** | **-0.036**** |
| | (0.046) | (0.018) | (0.045) | (0.018) |
| **Independent school (reference: Catholic school)** | **-0.013** | **-0.005** | **-0.067** | **-0.027** |
| | (0.061) | (0.024) | (0.054) | (0.022) |
| **NSW (reference: ACT)** | | | **0.462***** | **0.177***** |
| | | | (0.071) | (0.026) |
| **VIC (reference: ACT)** | | | **0.733***** | **0.268***** |
| | | | (0.082) | (0.026) |
| **QLD (reference: ACT)** | | | **0.379***** | **0.145***** |
| | | | (0.076) | (0.028) |
| **SA (reference: ACT)** | | | **0.467***** | **0.176***** |
| | | | (0.080) | (0.028) |
| **WA (reference: ACT)** | | | **0.205**** | **0.080**** |
| | | | (0.087) | (0.033) |
| **TAS (reference: ACT)** | | | **0.340***** | **0.130***** |
| | | | (0.087) | (0.032) |
| **NT (reference: ACT)** | | | **0.437***** | **0.164***** |
| | | | (0.103) | (0.036) |
| **Constant** | **-1.694** | | **-2.397**** | |
| | (1.236) | | (1.169) | |
| **Observations** | 10513 | | | 10,513 |
| **Log pseudolikelihood** | -6628.152 | | | -6533.334 |
| **Pseudo R2** | 0.085 | | | 0.098 |

Note: ***p<.01; **p<.5; *p<.1. Standard errors are reported in parenthesis.

**Table E2: Decomposition of the difference in probability of intending to go to university between non-Indigenous and Indigenous students**

| | Model (1) | | Model (2) | |
|---|---|---|---|---|
| **Raw gap** | **Characteristics effect** | **Coefficient effect** | **Characteristics effect** | **Coefficient effect** |
| **0.174*** ** | 0.163*** | 0.021 | 0.183*** | -0.0001 |
| **(0.023)** | (0.023) | (0.033) | (0.023) | (0.032) |
| **Detailed decomposition:** | | | | |
| **Wave 2009** | -0.001*** | -0.012 | -0.001*** | 0.0001 |
| | (0.000) | (0.026) | (0.000) | (0.041) |
| **Age** | -0.0004 | 0.002 | -0.001* | -0.00005 |
| | (0.000) | (0.001) | (0.000) | (0.017) |
| **Male** | -0.002** | 0.019 | -0.002** | -0.0003 |
| | (0.001) | (0.045) | (0.001) | (0.127) |
| **Mother university education** | 0.004*** | 0.002 | 0.004*** | -0.00002 |
| | (0.001) | (0.010) | (0.001) | (0.006) |
| **Father university education** | 0.009*** | -0.0004 | 0.008*** | 0.00004 |
| | (0.002) | (0.007) | (0.002) | (0.014) |
| **Mother TAFE education** | -0.001 | -0.007 | -0.001 | 0.0002 |
| | (0.000) | (0.013) | (0.000) | (0.056) |
| **Father TAFE education** | 0.001 | -0.024* | 0.000 | 0.0004 |
| | (0.000) | (0.014) | (0.000) | (0.157) |
| **Mother did not complete year 12** | 0.002 | 0.0004 | 0.002 | 0.0001 |
| | (0.002) | (0.024) | (0.002) | (0.022) |
| **Father did not complete year 12** | 0.001 | 0.018 | 0.001 | -0.0004 |
| | (0.002) | (0.032) | (0.002) | (0.145) |
| **Mother blue collar** | -0.001 | 0.011 | -0.0005 | -0.0002 |
| | (0.001) | (0.009) | (0.001) | (0.077) |
| **Father blue collar** | 0.002 | 0.010 | 0.002 | -0.0002 |
| | (0.002) | (0..020) | (0.001) | (0.081) |
| **Books 0-25 (reference: more than 100 books)** | -0.008 | 0.072* | -0.009* | -0.001 |
| | (0.005) | (0.041) | (0.005) | (0.525) |
| **Books 26-100 (reference: more than 100 books)** | -0.0003 | 0.018 | -0.0003 | -0.0003 |
| | (0.000) | (0.021) | (0.000) | (0.121) |
| **Students does not have a desk** | 0.007*** | -0.013 | 0.008*** | 0.0003 |
| | (0.002) | (0.011) | (0.002) | (0.098) |
| **No quiet place to study** | 0.001 | 0.001 | 0.001 | 0.000 |
| | (0.001) | (0.011) | (0.001) | (0.003) |
| **No internet at home** | 0.015*** | -0.015 | 0.014** | 0.0003 |
| | (0.004) | (0.013) | (0.004) | (0.102) |
| **Student ESCS** | 0.005 | 0.016 | 0.004 | -0.0003 |
| | (0.006) | (0.021) | (0.006) | (0.124) |
| **School average ESCS** | 0.0003 | -0.001 | 0.008 | 0.00002 |
| | (0.008) | (0.005) | (0.008) | (0.009) |
| **Estimated school quality** | 0.002*** | -0.0005 | 0.003*** | 0.00001 |
| | (0.000) | (0.000) | (0.000) | (0.005) |
| **Estimated PISA score** | 0.094** | 0.980 | 0.105** | -0.019 |
| | (0.043) | (1.181) | (0.043) | (7.161) |

| | | | | |
|---|---|---|---|---|
| **Minutes of class time reading per week** | -0.007*** | 0.001 | -0.008*** | -0.00004 |
| | (0.002) | (0.007) | (0.002) | (0.013) |
| **Minutes of class time maths per week** | 0.007*** | -0.001 | 0.006** | 0.00002 |
| | (0.003) | (0.009) | (0.003) | (0.008) |
| **Minutes of class time science per week** | 0.010*** | 0.007 | 0.012*** | -0.0001 |
| | (0.002) | (0.008) | (0.002) | (0.045) |
| **Computers per student** | 0.001*** | -0.0002 | 0.001** | 0.00001 |
| | (0.000) | (0.001) | (0.000) | (0.005) |
| **Shortage of qualifies teachers** | 0.007*** | -0.0002 | 0.005*** | 0.00004 |
| | (0.002) | (0.009) | (0.002) | (0.013) |
| **Students/teacher ratio** | -0.000*** | 0.001 | -0.0002*** | -0.0001 |
| | (0.000) | (0.004) | (0.000) | (0.024) |
| **Constant pressure from parents about academic performance** | 0.002** | 0.011 | -0.002 | -0.0002 |
| | (0.001) | (0.013) | (0.002) | (0.077) |
| **School provides info to parents on their child's performance relative to other year 9 students in the school** | 0.0002 | 0.004 | 0.002** | 0.000 |
| | (0.001) | (0.022) | (0.001) | (0.001) |
| **School provides info to parents on their child's performance relative to regional or national benchmarks** | 0.004*** | 0.033* | 0.001 | -0.001 |
| | (0.001) | (0.018) | (0.001) | (0.239) |
| **School provides info to parents on their child's performance relative to other year 9 students in other schools** | -0.0004 | -0.007 | 0.0002 | 0.0001 |
| | (0.000) | (0.010) | (0.000) | (0.020) |
| **Government school (reference: Catholic school)** | 0.009*** | 0.032 | 0.007** | -0.001 |
| | (0.003) | (0.041) | (0.003) | (0.223) |
| **Independent school (reference: Catholic school)** | -0.001 | -0.002 | -0.003 | 0.00003 |
| | (0.002) | (0.004) | (0.002) | (0.011) |
| **NSW (reference: ACT)** | | | 0.003*** | -0.0001 |
| | | | (0.000) | (0.020) |
| **VIC (reference: ACT)** | | | 0.036*** | 0.00002 |
| | | | (0.003) | (0.009) |
| **QLD (reference: ACT)** | | | -0.017*** | 0.0002 |
| | | | (0.003) | (0.077) |
| **SA (reference: ACT)** | | | 0.011*** | 0.000 |
| | | | (0.002) | (0.002) |
| **WA (reference: ACT)** | | | 0.001*** | 0.0002 |
| | | | (0.000) | (0.076) |
| **TAS (reference: ACT)** | | | -0.006*** | 0.0003 |
| | | | (0.002) | (0.107) |
| **NT (reference: ACT)** | | | -0.015*** | -0.0000 |
| | | | (0.003) | (0.0006) |
| **Constant** | | -1.137 | | 0.022 |
| | | (1.313) | | (8.159) |

Note: ***p<.01; **p<.5; *p<.1. Standard errors are reported in parenthesis. The raw gap may not be exactly equal to the sum of characteristics effect and coefficient effect due to the nonlinear nature of the decomposition.

## 5.6 Appendix F: university participation

**Table F1: full model of the probability of going to university, pooled 2006 and 2009**

| | (1) | | (2) | |
|---|---|---|---|---|
| | **Coef.** | **M.E.** | **Coef.** | **M.E.** |
| Wave 2009 | **0.068** | **0.026** | **0.050** | **0.019** |
| | (0.045) | (0.017) | (0.044) | (0.016) |
| Indigenous | **0.108** | **0.041** | **0.058** | **0.022** |
| | (0.149) | (0.058) | (0.150) | (0.057) |
| Wave 2009*Indigenous | **-0.242** | **-0.086** | **-0.196** | **-0.070** |
| | (0.162) | (0.054) | (0.163) | (0.055) |
| Age | **0.277*** ** | **0.103*** ** | **0.321*** ** | **0.120*** ** |
| | (0.077) | (0.029) | (0.078) | (0.031) |
| Male | **-0.046** | **-0.017** | **-0.108** | **-0.040** |
| | (0.089) | (0.033) | (0.090) | (0.033) |
| Mother university education | **0.147*** ** | **0.056** ** | **0.153*** ** | **0.058*** ** |
| | (0.040) | (0.015) | (0.040) | (0.015) |
| Father university education | **0.111*** ** | **0.042*** ** | **0.117*** ** | **0.044*** ** |
| | (0.041) | (0.016) | (0.041) | (0.016) |
| Mother TAFE education | **-0.005** | **-0.002** | **-0.004** | **-0.002** |
| | (0.034) | (0.013) | (0.034) | (0.013) |
| Father TAFE education | **-0.033** | **-0.012** | **-0.040** | **-0.015** |
| | (0.032) | (0.012) | (0.033) | (0.012) |
| Mother did not complete year 12 | **-0.014** | **-0.005** | **-0.027** | **-0.010** |
| | (0.034) | (0.013) | (0.034) | (0.013) |
| Father did not complete year 12 | **-0.117*** ** | **-0.044*** ** | **-0.126*** ** | **-0.047*** ** |
| | (0.040) | (0.015) | (0.041) | (0.015) |
| Mother blue collar | **-0.033** | **-0.012** | **-0.057** | **-0.021** |
| | (0.054) | (0.020) | (0.056) | (0.020) |
| Father blue collar | **-0.020** | **-0.008** | **-0.029** | **-0.011** |
| | (0.034) | (0.013) | (0.034) | (0.013) |
| Books 0-25 (reference: more than 100 books) | **0.196*** | **0.075*** | **0.101** | **0.038** |
| | (0.114) | (0.044) | (0.117) | (0.045) |
| Books 26-100 (reference: more than 100 books) | **0.073** | **0.027** | **0.019** | **0.007** |
| | (0.060) | (0.023) | (0.061) | (0.023) |
| Students does not have a desk | **-0.332*** ** | **-0.116*** ** | **-0.320*** ** | **-0.112*** ** |
| | (0.068) | (0.022) | (0.068) | (0.022) |
| No quiet place to study | **-0.040** | **-0.015** | **-0.050** | **-0.019** |
| | (0.060) | (0.022) | (0.061) | (0.023) |
| No internet at home | **-0.460*** ** | **-0.155*** ** | **-0.414*** ** | **-0.141*** ** |
| | (0.081) | (0.024) | (0.082) | (0.025) |
| Student ESCS | **-0.066** | **-0.025** | **-0.047** | **-0.017** |
| | (0.045) | (0.017) | (0.045) | (0.017) |
| School average ESCS | **0.031** | **0.012** | **0.211** | **0.079** |
| | (0.120) | (0.045) | (0.129) | (0.048) |
| School quality estimated | **0.008*** ** | **0.003*** ** | **0.007*** ** | **0.003*** ** |
| | (0.001) | (0.000) | (0.001) | (0.001) |
| fixedpart_readuse | **0.008*** ** | **0.003*** ** | **0.006** ** | **0.002** ** |
| | (0.002) | (0.001) | (0.003) | (0.001) |
| Minutes of class time reading per week | **-0.001*** ** | **-0.000*** ** | **-0.001*** ** | **-0.000*** ** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| Minutes of class time maths per week | **0.000*** | **0.000*** | **0.001** ** | **0.000** ** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| Minutes of class time science per week | **0.001** ** | **0.000** ** | **0.001*** ** | **0.000*** ** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| Computers per student | **0.112** | **0.042** | **-0.027** | **-0.010** |

| | | | | |
|---|---|---|---|---|
| | (0.151) | (0.056) | (0.143) | (0.053) |
| Shortage of qualifies teachers | **0.132*** ** | **0.050*** ** | **0.125*** ** | **0.050*** ** |
| | (0.045) | (0.017) | (0.045) | (0.017) |
| Students/teacher ratio | **0.011** | **0.004** | **0.012** | **0.005** |
| | (0.013) | (0.005) | (0.012) | (0.005) |
| Constant pressure from parents about academic performance | **0.032** | **0.012** | **0.008** | **0.003** |
| | (0.049) | (0.018) | (0.048) | (0.018) |
| School provides info to parents on their child's performance relative to other year 9 students in the school | **0.025** | **0.009** | **0.051** | **0.019** |
| | (0.045) | (0.017) | (0.043) | (0.016) |
| School provides info to parents on their child's performance relative to regional or national benchmarks | **0.014** | **0.005** | **0.008** | **0.003** |
| | (0.048) | (0.018) | (0.054) | (0.020) |
| School provides info to parents on their child's performance relative to other year 9 students in other schools | **-0.034** | **-0.013** | **0.016** | **0.005** |
| | (0.060) | (0.022) | (0.063) | (0.023) |
| Government school (reference: Catholic school) | **-0.192*** ** | **-0.072*** ** | **-0.188*** ** | **-0.070*** ** |
| | (0.056) | (0.021) | (0.054) | (0.020) |
| Independent school (reference: Catholic school) | **-0.060** | **-0.022** | **-0.139*** | **-0.051*** |
| | (0.075) | (0.028) | (0.073) | (0.026) |
| NSW (reference: ACT) | | | **0.341*** ** | **0.130*** ** |
| | | | (0.073) | (0.028) |
| VIC (reference: ACT) | | | **0.483*** ** | **0.187*** ** |
| | | | (0.081) | (0.032) |
| QLD (reference: ACT) | | | **0.589*** ** | **0.228*** ** |
| | | | (0.074) | (0.029) |
| SA (reference: ACT) | | | **0.414*** ** | **0.161*** ** |
| | | | (0.076) | (0.030) |
| WA (reference: ACT) | | | **0.475*** ** | **0.185*** ** |
| | | | (0.083) | (0.033) |
| TAS (reference: ACT) | | | **-0.045** | **-0.017** |
| | | | (0.090) | (0.033) |
| NT (reference: ACT) | | | **0.213*** | **0.082*** |
| | | | (0.120) | (0.047) |
| Constant | **-4.301*** ** | | **-3.790*** ** | |
| | (1.348) | | (1.382) | |
| **Observations** | 9666 | | | 9,666 |
| **Log pseudolikelihood** | -5585.944 | | | -5503.979 |
| **Pseudo R2** | 0.130 | | | 0.143 |

Note: ***p<.01; **p<.5; *p<.1. Standard errors are reported in parenthesis.

**Table F2: Decomposition of the difference in probability of going to university between non-Indigenous and Indigenous students**

| | Model (1) | | Model (2) | |
|---|---|---|---|---|
| **Raw gap** | **Characteristics effect** | **Coefficient effect** | **Characteristics effect** | **Coefficient effect** |
| **0.197*** ** | 0.201*** | -0.006 | 0.193*** | 0.002 |
| **(0.023)** | (0.015) | (0.022) | (0.016) | (0.022) |
| **Detailed decomposition:** | | | | |
| **Cohort: 1 if 2009** | 0.0002** | 0.001 | 0.0001 | -0.0003 |
| | (0.000) | (0.006) | (0.000) | (0.003) |
| **Age** | 0.001*** | -0.001 | 0.001*** | 0.0002 |
| | (0.000) | (0.004) | (0.000) | (0.002) |
| **Male** | -0.0002 | -0.018 | -0.001 | 0.005 |
| | (0.001) | (0.087) | (0.002) | (0.044) |
| **Mother university education** | 0.004*** | 0.003 | 0.004*** | -0.001 |
| | (0.001) | (0.013) | (0.001) | (0.006) |
| **Father university education** | 0.005*** | -0.0002 | 0.005*** | -0.0001 |
| | (0.002) | (0.002) | (0.002) | (0.001) |
| **Mother TAFE education** | 0.0002 | 0.004 | 0.0002 | -0.001 |
| | (0.000) | (0.020) | (0.0004) | (0.011) |
| **Father TAFE education** | 0.0001 | 0.003 | 0.0001 | -0.0002 |
| | (0.000) | (0.013) | (0.0001) | (0.002) |
| **Mother did not complete year 12** | 0.001 | 0.0002 | 0.001 | -0.0002 |
| | (0.002) | (0.027) | (0.002) | (0.002) |
| **Father did not complete year 12** | 0.005*** | -0.004 | 0.006*** | 0.001 |
| | (0.002) | (0.021) | (0.002) | (0.014) |
| **Mother blue collar** | 0.0002 | -0.004 | 0.0004 | 0.001 |
| | (0.001) | (0.022) | (0.001) | (0.010) |
| **Father blue collar** | 0.001 | -0.002 | 0.001 | 0.001 |
| | (0.001) | (0.011) | (0.001) | (0.008) |
| **Books 0-25 (reference: more than 100 books)** | -0.011** | -0.025 | -0.007 | 0.007 |
| | (0.004) | (0.123) | (0.004) | (0.063) |
| **Books 26-100 (reference: more than 100 books)** | -0.0004* | -0.014 | -0.0002 | 0.003 |
| | (0.000) | (0.066) | (0.0002) | (0.032) |
| **Students does not have a desk** | 0.009*** | -0.004 | 0.009*** | 0.001 |
| | (0.002) | (0.017) | (0.002) | (0.009) |
| **No quiet place to study** | 0.001 | -0.001 | 0.001 | 0.0004 |
| | (0.001) | (0.008) | (0.001) | (0.004) |
| **No internet at home** | 0.023*** | 0.003 | 0.021*** | -0.001 |
| | (0.004) | (0.017) | (0.004) | (0.007) |
| **Student ESCS** | -0.008* | -0.00004 | -0.006 | 0.0004 |
| | (0.005) | (0.004) | (0.005) | (0.004) |
| **School average ESCS** | -0.001 | 0.003 | 0.010 | -0.001 |
| | (0.006) | (0.014) | (0.007) | (0.007) |
| **Estimated school quality** | 0.003*** | 0.0001 | 0.003*** | -0.00004 |
| | (0.000) | (0.001) | (0.000) | (0.000) |
| **Estimated PISA score (fixed part)** | 0.147*** | -0.514 | 0.119*** | 0.137 |
| | (0.033) | (2.537) | (0.034) | (1.291) |

| | | | | |
|---|---|---|---|---|
| **Minutes of class time reading per week** | -0.005*** | -0.001 | -0.006*** | 0.0001 |
| | (0.002) | (0.004) | (0.002) | (0.001) |
| **Minutes of class time maths per week** | 0.004* | -0.0003 | 0.005** | 0.0002 |
| | (0.002) | (0.002) | (0.002) | (0.002) |
| **Minutes of class time science per week** | 0.005*** | -0.004 | 0.007*** | 0.001 |
| | (0.002) | (0.017) | (0.002) | (0.001) |
| **Computers per student** | 0.0002 | 0.00004 | -0.000 | -0.00004 |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| **Shortage of qualifies teachers** | 0.005*** | -0.001 | 0.005*** | 0.00001 |
| | (0.001) | (0.006) | (0.002) | (0.000) |
| **Students/teacher ratio** | -0.0001 | -0.0004 | -0.0001 | 0.0001 |
| | (0.000) | (0.002) | (0.000) | (0.001) |
| **Constant pressure from parents about academic performance** | 0.001 | -0.004 | 0.0004 | 0.001 |
| | (0.001) | (0.019) | (0.001) | (0.010) |
| **School provides info to parents on their child's performance relative to other year 9 students in the school** | 0.001 | -0.004 | 0.001 | 0.0002 |
| | (0.001) | (0.019) | (0.001) | (0.002) |
| **School provides info to parents on their child's performance relative to regional or national benchmarks** | 0.0005 | -0.006 | 0.0003 | 0.001 |
| | (0.001) | (0.028) | (0.001) | (0.010) |
| **School provides info to parents on their child's performance relative to other year 9 students in other schools** | -0.0002 | 0.003 | 0.00002 | -0.001 |
| | (0.000) | (0.015) | (0.000) | (0.008) |
| **Government school (reference: Catholic school)** | 0.012*** | 0.00003 | 0.012*** | 0.001 |
| | (0.002) | (0.008) | (0.002) | (0.010) |
| **Independent school (reference: Catholic school)** | -0.002 | 0.001 | -0.005*** | -0.0002 |
| | (0.002) | (0.007) | (0.002) | (0.002) |
| **NSW (reference: ACT)** | | | 0.002*** | -0.001 |
| | | | (0.000) | (0.011) |
| **VIC (reference: ACT)** | | | 0.018*** | -0.0003 |
| | | | (0.003) | (0.003) |
| **QLD (reference: ACT)** | | | -0.020*** | -0.002 |
| | | | (0.002) | (0.022) |
| **SA (reference: ACT)** | | | 0.008*** | 0.00001 |
| | | | (0.001) | (0.000) |
| **WA (reference: ACT)** | | | 0.002*** | -0.001 |
| | | | (0.000) | (0.010) |
| **TAS (reference: ACT)** | | | 0.001 | -0.001 |
| | | | (0.001) | (0.010) |
| **NT (reference: ACT)** | | | -0.005* | -0.148 |
| | | | (0.003) | (1.393) |
| **Constant** | | 0.581 | | -0.148 |
| | | (2.872) | | (1.393) |

## 5.7 Appendix G: Participation in VET (certificate III or higher)

**Table G1: Estimation of the probability of VET participation (certificate III oe higher),pooled 2006 and 2009**

| | (1) | | (2) | |
|---|---|---|---|---|
| | **Coef.** | **M.E.** | **Coef.** | **M.E.** |
| Wave 2009 | **-0.055** | **-0.014** | **-0.044** | **-0.011** |
| | (0.039) | (0.010) | (0.039) | (0.010) |
| Indigenous | **-0.158** | **-0.038** | **-0.195** | **-0.045*** |
| | (0.123) | (0.027) | (0.122) | (0.026) |
| Wave 2009*Indigenous | **-0.0001** | **-0.000** | **0.018** | **0.005** |
| | (0.141) | (0.036) | (0.139) | (0.036) |
| Age | **0.358***** | **0.091***** | **0.375***** | **0.095***** |
| | (0.070) | (0.018) | (0.071) | (0.018) |
| Male | **0.046** | **0.012** | **0.020** | **0.005** |
| | (0.081) | (0.021) | (0.081) | (0.020) |
| Mother university education | **-0.178***** | **-0.044***** | **-0.180***** | **-0.044***** |
| | (0.046) | (0.011) | (0.046) | (0.011) |
| Father university education | **-0.158***** | **-0.039***** | **-0.159***** | **-0.039***** |
| | (0.048) | (0.012) | (0.048) | (0.012) |
| Mother TAFE education | **0.051** | **0.013** | **0.043** | **0.011** |
| | (0.037) | (0.009) | (0.037) | (0.010) |
| Father TAFE education | **0.056** | **0.014** | **0.046** | **0.012** |
| | (0.034) | (0.009) | (0.034) | (0.009) |
| Mother did not complete year 12 | **0.021** | **0.005** | **0.012** | **0.003** |
| | (0.037) | (0.009) | (0.037) | (0.009) |
| Father did not complete year 12 | **0.050** | **0.013** | **0.045** | **0.012** |
| | (0.039) | (0.010) | (0.040) | (0.010) |
| Mother blue collar | **-0.010** | **-0.002** | **-0.016** | **-0.004** |
| | (0.059) | (0.015) | (0.058) | (0.015) |
| Father blue collar | **0.042** | **0.011** | **0.034** | **0.009** |
| | (0.037) | (0.009) | (0.036) | (0.009) |
| Books 0-25 (reference: more than 100 books) | **0.084** | **0.022** | **0.027** | **0.007** |
| | (0.108) | (0.029) | (0.109) | (0.028) |
| Books 26-100 (reference: more than 100 books) | **0.109*** | **0.028*** | **0.081** | **0.021** |
| | (0.059) | (0.016) | (0.059) | (0.015) |
| Students does not have a desk | **0.028** | **0.007** | **0.040** | **0.010** |
| | (0.065) | (0.017) | (0.065) | (0.017) |
| No quiet place to study | **-0.006** | **-0.002** | **-0.017** | **-0.004** |
| | (0.057) | (0.014) | (0.057) | (0.014) |
| No internet at home | **-0.071** | **-0.018** | **-0.048** | **-0.012** |
| | (0.065) | (0.015) | (0.065) | (0.016) |
| Student ESCS | **0.040** | **0.010** | **0.050** | **0.013** |
| | (0.042) | (0.011) | (0.042) | (0.011) |
| School average ESCS | **-0.277***** | **-0.070***** | **-0.264**** | **-0.067**** |
| | (0.106) | (0.027) | (0.107) | (0.027) |
| School quality estimated | **-0.003***** | **-0.001***** | **-0.005***** | **-0.001***** |
| | (0.001) | (0.000) | (0.001) | (0.000) |
| fixedpart_readuse | **-0.001** | **-0.0002** | **-0.002** | **-0.0005** |
| | (0.002) | (0.001) | (0.002) | (0.001) |

| | | | | |
|---|---|---|---|---|
| Minutes of class time reading per week | **0.0005**** | **0.0001**** | **0.0004**** | **0.000**** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| Minutes of class time maths per week | **-0.0004*** | **-0.000*** | **-0.0003** | **-0.000** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| Minutes of class time science per week | **-0.0003** | **-0.000** | **-0.0002** | **-0.000** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| Computers per student | **-0.129** | **-0.033** | **-0.152** | **-0.039** |
| | (0.143) | (0.036) | (0.145) | (0.037) |
| Shortage of qualifies teachers | **-0.039** | **-0.010** | **-0.045** | **-0.011** |
| | (0.039) | (0.010) | (0.038) | (0.010) |
| Students/teacher ratio | **0.003** | **0.0008** | **0.006** | **0.002** |
| | (0.007) | (0.002) | (0.007) | (0.002) |
| Constant pressure from parents about academic performance | **-0.059** | **-0.015** | **-0.051** | **-0.013** |
| | (0.045) | (0.011) | (0.045) | (0.011) |
| School provides info to parents on their child's performance relative to other year 9 students in the school | **0.095***** | **0.024***** | **0.058** | **0.015** |
| | (0.037) | (0.009) | (0.037) | (0.009) |
| School provides info to parents on their child's performance relative to regional or national benchmarks | **0.002** | **0.001** | **0.011** | **0.0029** |
| | (0.036) | (0.009) | (0.038) | (0.010) |
| School provides info to parents on their child's performance relative to other year 9 students in other schools | **-0.025** | **-0.006** | **-0.033** | **-0.008** |
| | (0.046) | (0.012) | (0.045) | (0.011) |
| Government school (reference: Catholic school) | **0.008** | **0.002** | **-0.023** | **-0.006** |
| | (0.049) | (0.012) | (0.049) | (0.013) |
| Independent school (reference: Catholic school) | **-0.033** | **-0.008** | **-0.036** | **-0.009** |
| | (0.060) | (0.015) | (0.058) | (0.014) |
| NSW (reference: ACT) | | | **0.097** | **0.025** |
| | | | (0.075) | (0.020) |
| VIC (reference: ACT) | | | **-0.036** | **-0.009** |
| | | | (0.083) | (0.021) |
| QLD (reference: ACT) | | | **0.122** | **0.032** |
| | | | (0.077) | (0.021) |
| SA (reference: ACT) | | | **-0.055** | **-0.014** |
| | | | (0.082) | (0.020) |
| WA (reference: ACT) | | | **0.182**** | **0.049**** |
| | | | (0.085) | (0.024) |
| TAS (reference: ACT) | | | **-0.143** | **-0.034** |
| | | | (0.099) | (0.022) |
| NT (reference: ACT) | | | **-0.202**** | **-0.047**** |
| | | | (0.097) | (0.020) |
| Constant | **-0.436** | | **0.085** | |
| | (1.181) | | (1.177) | |
| **Observations** | 9,666 | | | 9,666 |
| **Log pseudolikelihood** | -4400.846 | | | -4379.025 |
| **Pseudo R2** | 0.045 | | | 0.049 |

Note: ***p<.01; **p<.5; *p<.1. Standard errors clustered at school level are reported in parenthesis.

**Table G2: Decomposing the gap in rate of VET participation between non-Indigenous and Indigenous students, 2006 and 2009**

| | (1) | | (2) | |
|---|---|---|---|---|
| **Raw gap** | **Characteristics effect** | **Coefficient effect** | **Characteristics effect** | **Coefficient effect** |
| **0.007** | -0.054** | 0.049 | -0.063** | 0.053 |
| **(0.019)** | (0.025) | (0.032) | (0.026) | (0.033) |
| **Detailed decomposition:** | | | | |
| **Wave 2009** | -0.001 | 0.010 | -0.0001 | 0.005 |
| | (0.000) | (0.022) | (0.000) | (0.022) |
| **Age** | 0.001*** | 0.001 | 0.001 | 0.001 |
| | (0.000) | (0.001) | (0.000) | (0.001) |
| **Male** | 0.0003 | -0.019 | 0.0003 | -0.005 |
| | (0.001) | (0.041) | (0.001) | (0.038) |
| **Mother university education** | -0.005*** | -0.011 | -0.005*** | -0.008 |
| | (0.001) | (0.009) | (0.001) | (0.009) |
| **Father university education** | -0.007*** | 0.0002 | -0.007*** | 0.0005 |
| | (0.002) | (0.007) | (0.002) | (0.007) |
| **Mother TAFE education** | -0.001 | -0.008 | -0.0005 | -0.009 |
| | (0.000) | (0.012) | (0.000) | (0.011) |
| **Father TAFE education** | -0.0001* | 0.012 | -0.0001 | 0.012 |
| | (0.000) | (0.013) | (0.000) | (0.012) |
| **Mother did not complete year 12** | -0.001 | -0.011 | -0.0003 | -0.011 |
| | (0.002) | (0.021) | (0.002) | (0.021) |
| **Father did not complete year 12** | -0.003 | 0.043 | -0.002 | 0.043 |
| | (0.002) | (0.028) | (0.002) | (0.028) |
| **Mother blue collar** | -0.001 | -0.014 | 0.0001 | 0.009 |
| | (0.002) | (0.022) | (0.001) | (0.007) |
| **Father blue collar** | -0.003 | 0.037 | -0.001 | 0.021 |
| | (0.002) | (0.029) | (0.001) | (0.017) |
| **Books 0-25 (reference: more than 100 books)** | -0.003 | 0.008 | -0.001 | 0.007 |
| | (0.004) | (0.008) | (0.001) | (0.034) |
| **Books 26-100 (reference: more than 100 books)** | -0.0003* | 0.019 | -0.0002 | -0.006 |
| | (0.000) | (0.018) | (0.000) | (0.018) |
| **Students does not have a desk** | -0.001 | 0.011 | -0.002 | 0.012 |
| | (0.002) | (0.009) | (0.002) | (0.009) |
| **No quiet place to study** | 0.0002 | -0.001 | 0.0004 | 0.003 |
| | (0.001) | (0.010) | (0.001) | (0.009) |
| **No internet at home** | 0.002 | 0.005 | 0.001 | 0.005 |
| | (0.003) | (0.011) | (0.003) | (0.011) |
| **Student ESCS** | 0.005 | -0.019 | 0.006 | -0.012 |
| | (0.005) | (0.019) | (0.005) | (0.018) |
| **School average ESCS** | -0.017*** | -0.001 | -0.017*** | -0.004 |
| | (0.006) | (0.004) | (0.006) | (0.004) |
| **School quality estimated** | -0.001*** | -0.0004 | -0.002*** | -0.0005 |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| **fixedpart_readuse** | -0.019 | 0.195 | -0.033 | 0.332 |
| | (0.039) | (1.047) | (0.041) | (0.988) |
| **Minutes of class time reading per week** | 0.003* | 0.006 | 0.003* | 0.005 |
| | (0.002) | (0.006) | (0.002) | (0.006) |
| **Minutes of class time maths per week** | -0.003 | -0.004 | -0.003 | -0.002 |

| | | | | |
|---|---|---|---|---|
| | (0.002) | (0.008) | (0.002) | (0.008) |
| **Minutes of class time science per week** | -0.003 | -0.004 | -0.002 | -0.0001 |
| | (0.002) | (0.007) | (0.002) | (0.007) |
| **Computers per student** | -0.0002 | 0.001 | -0.0002 | 0.001 |
| | (0.000) | (0.001) | (0.000) | (0.001) |
| **Shortage of qualifies teachers** | -0.002 | -0.014* | -0.002 | -0.015* |
| | (0.0021) | (0.008) | (0.002) | (0.009) |
| **Students/teacher ratio** | -0.00002 | -0.002 | -0.0001 | -0.003 |
| | (0.000) | (0.004) | (0.000) | (0.004) |
| **Constant pressure from parents about academic performance** | -0.002* | -0.019* | -0.001 | -0.016 |
| | (0.001) | (0.010) | (0.001) | (0.010) |
| **School provides info to parents on their child's performance relative to other year 9 students in the school** | 0.003*** | 0.038* | 0.002* | 0.035* |
| | (0.001) | (0.020) | (0.001) | (0.021) |
| **School provides info to parents on their child's performance relative to regional or national benchmarks** | 0.00002 | -0.020 | -0.000 | -0.033** |
| | (0.001) | (0.015) | (0.001) | (0.016) |
| **School provides info to parents on their child's performance relative to other year 9 students in other schools** | -0.00003 | 0.023** | -0.0001 | 0.020** |
| | (0.000) | (0.009) | (0.000) | (0.009) |
| **Government school (reference: Catholic school)** | -0.001 | 0.053 | 0.001 | 0.054 |
| | (0.002) | (0.039) | (0.003) | (0.038) |
| **Independent school (reference: Catholic school)** | -0.001 | 0.001 | -0.001 | 0.002 |
| | (0.002) | (0.004) | (0.002) | (0.004) |
| **NSW (reference: ACT)** | | | 0.0005 | -0.010 |
| | | | (0.000) | (0.024) |
| **VIC (reference: ACT)** | | | -0.001 | 0.005 |
| | | | (0.003) | (0.005) |
| **QLD (reference: ACT)** | | | -0.004 | -0.032 |
| | | | (0.003) | (0.029) |
| **SA (reference: ACT)** | | | -0.001 | -0.006 |
| | | | (0.002) | (0.005) |
| **WA (reference: ACT)** | | | 0.001 | -0.003 |
| | | | (0.000) | (0.010) |
| **TAS (reference: ACT)** | | | 0.002** | -0.007 |
| | | | (0.001) | (0.014) |
| **NT (reference: ACT)** | | | 0.006** | -0.011 |
| | | | (0.003) | (0.014) |
| **Constant** | | 0.179 | | -0.323 |
| | | (1.169) | | (1.106) |

Note: ***p<.01; **p<.5; *p<.1. Standard errors are reported in parenthesis. The raw gap may not be exactly equal to the sum of characteristics effect and coefficient effect due to the nonlinear nature of the decomposition