The impact of school choice on students’ university entrance rank scores in Australia

Chris Ryan, *Australian National University*
Louise Watson, *University of Canberra*

**Abstract**

In Australia, students complete 12 years of formal schooling and normally seek entry to university after completing Year 12 (at around 18 years of age). Students’ results on completing Year 12 are standardised to give each student a university entrance rank score which is used to apply for admission to university courses nationwide. A student’s entrance rank score is a ‘high stakes’ assessment of student achievement on graduation from school as it is the principal means by which young people leaving school in Australia are offered university places. Not all students obtain an entrance rank, even among those who complete Year 12, so there are a number of selection issues to be taken into account in analysing the impact of the school choice, in addition to sorting effects associated with school sector choices. Nevertheless there does still seem to be a private school effect on entrance rank scores (Marks 2004). This effect is of the order of 5 points for independent schools and 3 points for catholic schools. By way of comparison, a one standard deviation in school achievement measured in Year 9 was associated with a 10 point increase in entrance rank scores (Marks 2004: Table 2).

This paper examines the impact on students’ entrance rank scores of choosing a new type of school for the final two years of schooling (Years 11 and 12). In some regions of Australia, high schools end at Year 10 and students are required to choose a new school to attend for Years 11 and 12. Students in public schools in the Australian Capital Territory, Tasmania and some rural areas in other jurisdictions face this decision, as do students in some private schools across Australia. Students in these particular schools are *required* to choose a new school after Year 10. While these students are not randomly assigned to new schools, they are forced to make an involuntary choice, which distinguishes them from students who make an active choice to change schools. Studying the outcomes of this group of involuntary “choosers” may reduce the level of self-selection bias in estimating the impact of school choice on student achievement. This study compares the university entrance rank scores of students from the same source schools who make different choices of schools to attend in Years 11 and 12. We also compare the scores of those who are required to choose a new school in Year 11 with the scores of those students in their new schools.

In Australia, the federal government provides a weighted subsidy (voucher) for all students to attend the school of their choice in the private sector. Federal grants to private schools are supplemented by state government grants to the value of approximately half the federal grant. Public schools are fully government funded and enrol 59 per cent of students in Years 11 and 12. Schools in the catholic system receive a combined (ie federal and state) grant per student that is worth approximately 80 per cent of school costs. Catholic system schools charge their students a relatively low fee and enrol 22 per cent of all students in Years 11 and 12. Students attending independent schools attract a federal voucher weighted according to the socio-economic status (SES) of their parents’ home address ranging from 70 per cent to 14 per cent of school costs plus
a grant from the state government that is about half as much as the federal grant. The weighted subsidies are paid in a lump sum to the school and all students attending a particular school are charged the same fee. There are both high-fee and low-fee schools in the independent sector and all together, these schools enrol 19 per cent of students in Years 11 and 12.

Since the introduction of government subsidies in 1974, private schools have used the additional funding to increase the quality of their services (i.e. to reduce student: teacher ratios) rather than to reduce their fees. The private school enrolment share has grown in Australia since the 1970s, more among high-SES groups than among low-SES groups (Watson and Ryan 2004). This study takes account of the different socio-economic profiles of the student population in each school sector.

The study uses data from the Longitudinal Surveys of Australian Youth (LSAY) to assess the impact, if any, of school choice on university entrance rank scores after completing Year 12. The Longitudinal Surveys of Australian Youth (LSAY) is a national government-funded data collection that follows cohorts of students from the middle of high school through to their mid-twenties. It contains extensive information on students’ academic performance, social background, future study plans, occupational ambitions and their attitudes to schooling. This enables us to compare individuals who are alike in all aspects other than their new school choices. Data from Year 9 students in 1995 and 1998 will be used for this analysis. In the 1995 and 1998 cohorts, 787 and 829 respondents respectively reported they changed school because their school did not offer Years 11 and 12. This is a sufficiently large number of observations to support the analysis.

Methodology

The paper will use a number of methodologies to estimate the impact of attendance at a private school on university entrance scores. These include (reweighting) regression and non-parametric propensity score matching methodologies and fixed effect estimation using students observed choosing different school sectors who attended the same original school. With a rich set of covariates, as the LSAY data contain, the regression reweighting and matching methodologies allow estimation of treatment parameters that can be given causal interpretations. Both of these methodological approaches involve the estimation of a first stage equation looking at the determinants of choice of school sector. In this case, it will contain three outcomes: public, catholic and independent school sectors. The probabilities of choice of each of the three sectors are estimated for all individuals in the data.

Hirano, Imbens, and Ridder (2003) show that efficient estimates of average treatment effects of binary treatments on outcomes can be obtained by weighing the data with the inverse of a nonparametric estimate of the propensity score. Regression reweighting methodologies are explored empirically in Altonji, Bharadwaj and Lange (2008) and Nicholls (2008). Essentially the procedure involve reweighting ‘treatment’ and ‘control’ or ‘non-treatment’ groups so that the characteristics of some individuals receive greater weight in estimation than others. For example, those members of the control group most like treatment group members, in terms of their estimated propensity score, can be given greater weight in estimation than those less like the treatment group. This allows estimation of a ‘treatment on the treated’ parameter. Reweighting
treatment group members to the characteristics of the control group allows estimation of a 'treatment on the non-treated' parameter. Suitable reweighting of both groups, as specified by Hirano et al. (2003), allows estimation of an 'average treatment effect'.

Non-parametric propensity score matching methodologies methods are summarised in Angrist and Krueger (1999), Blundell and Costas-Dias (2000, 2009), and Heckman et al. (1997, 1999). More explicitly than reweighting, propensity score matching involves the comparison of the outcomes of the each member of the treatment group with those most like hem, in terms of their propensity scores, in the control or non-treatment group. Most often, an average of the outcomes from multiple members of the control group are used in the calculation of this comparison. Lechner (2002) shows how the normal binary treatment situation can be extended to more than two groups, as is the case here with public, catholic and independent schools.

Estimates to date suggest that the contribution to university entrance scores of changing school sector among those forced to make a new choice about the school they attend are quite similar to those estimated using students Year 9 choices. The effects are of the order of 5 points for independent schools and 3 points for catholic schools.

References