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The myth of markets in school education

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Overview

For 20 years some Australian school systems have been world leaders in giving schools more autonomy, and in trying to increase competition among them. Many countries are following suit, in the hope that policies to increase school competition will improve student performance. They will not. This is the myth of markets in school education. The reality is that competition does not drive enough parents to schools with higher levels of performance.

Governments have increased autonomy with little effect because it was not implemented as part of a larger plan to improve teaching and learning. Autonomy grants school leaders the authority to decide how their schools operate. It differs from competition, where schools compete for students. Yet autonomy and competition are often linked. Autonomy can allow schools to differentiate themselves, and thereby attract students from competitor schools.

For the first time, this report analyses the extent of school competition. On conservative estimates, at least 40 to 60 per cent of schools face no or very limited competition of the sort that will increase performance.

There are many reasons why. Not enough schools have competitors that are as high-performing, have room for new students, are affordable for enough families, or are physically close enough to provide the kind of competition that increases performance across systems.

What is more, governments can do little about it. Interventions to increase the capacity of schools or to cut fees through subsidies or

vouchers are expensive, and will only have a limited impact on school competition.

Increasing information also does little to increase competition. The *My School* website is world-class for giving families data on how schools perform. But even with this information, families generally don't move to high-performing schools nor leave low-performing ones. In general, good schools don't grow and bad schools don't shrink.

On autonomy, Australia and other countries have the wrong strategy. The world's best systems have varying levels of autonomy. But it is not central to their reforms. Instead, they articulate the best ways to teach and learn, then implement reform through high-quality systems of teacher development, appraisal and feedback, among other policies. Autonomous schools in Australia and other countries are no better at implementing these programs than are centralised schools.

School leaders should be empowered to run their schools well. But empowerment means much more than autonomy. Victoria, which led the world in increasing autonomy, does not perform above New South Wales, which until very recently had a centralised school system. School leaders are too often granted autonomy but lack the direction, support and development to lead the key reforms their schools need.

As this report illustrates, the reality of school education means that relying on markets is not the best way to improve student learning.

Box 1: Definitions of terms used in this report

Autonomy: An autonomous school has the authority to make its own decisions about how it operates, such as decisions over staffing, budget allocation or curriculum content. Increasing school autonomy means increasing the extent that school leaders are allowed to run their schools how they want.

Competition: School competition exists when schools compete for students (and then normally receive funding and/or school fees for each additional student). In theory, school competition encourages schools to offer education that is different from or better than what neighbouring schools provide.¹ Schools compete for students in many ways, as families look for many things in choosing a school (e.g. school environment and discipline, buildings and grounds, school reputation).

However, competition will only improve school systems when schools compete to attract students by raising performance and families choose schools based, at least in large part, on school performance. This is the focus of this report given the interest in improving the performance of school systems. Therefore, school competition is discussed in this report as *school competition based on school performance*.

Parents should be able to choose the school they want. But the right of parents to choose schools should not be confused with the idea that choice improves school performance.

Performance: In this report, ‘performance’ refers to the learning outcomes of students. The analysis of school competition presented in this report uses school scores on national student assessments (NAPLAN) as the school performance measure. This is not the only measure of school performance but it is the clearest measure available.

NAPLAN: The Australian National Assessment Program – Literacy and Numeracy (NAPLAN) has been in operation since 2008. It assesses Australian students in Years 3, 5, 7, and 9 in reading, writing, language conventions (spelling, grammar and punctuation), and numeracy. Results for each school are published on the *My School* website.

Equity: An equitable education system enables all students to access good quality education. Many studies of school autonomy and competition focus on equity issues.² School competition could lead to greater concentrations of advantage and disadvantage as parents can tend to choose schools with more wealthy students. While equity is an important issue, it is not analysed in this report. Instead, the focus is on the impact of competition and autonomy on performance.

¹ Bartlett (1993), p. 125; Schneider, *et al.* (2000), p. 9; Henig (1994), p. 57; Hilmer, *et al.* (1993), p. 2.

² See for example Musset, 2012; Fiske and Ladd (2000); Loveless and Field (2009), p. 108-109; Burgess, *et al.* (2009); Le Grand and Bartlett (1993), p. 133.

1. Increasing school competition

School competition is generally defined as schools competing against one another and striving to attract students.³ School choice and competition are often used interchangeably, but while they are interrelated concepts, they are not the same.⁴

Ensuring parents are free to choose schools is the first step in increasing school competition.⁵ The degree to which parents have meaningful choices in school education depends on differences in the education the schools offer.⁶ One school might focus on sport or a particular pedagogy or culture. That a variety of approaches to competition has benefits for families should not be discounted, but the key interest is in improving the performance of school systems. To improve performance across a system, schools must compete on performance.

School autonomy is important in increasing school competition because it gives schools the opportunity to vary the education they offer. School competition can improve performance across a system if families are free to choose schools with better learning and teaching. This doesn't mean schools won't try to improve or innovate if such choices don't exist, merely that improvements might be smaller because they won't stem from a market-based incentive to gain or retain students.

³ Bartlett (1993), p. 125; Schneider, *et al.* (2000), p.9; Henig (1994), p. 57; Hilmer, *et al.* (1993), p. 2.

⁴ For example, see Hess (2002), p 5.; Hastings, *et al.* (2005); Henig (1994).

⁵ Australian Competition and Consumer Commission (2008), p. 26.

⁶ *Ibid.*, p. 26.

Box 2: International data used in this report

This report uses data from two international surveys conducted by the OECD: the Programme for International School Assessment (2009) and the Teaching and Learning International Survey (2008).

The Programme for International School Assessment (PISA) tests the knowledge and skills of 15 year-olds in literacy, mathematics and science. In the latest assessments (2009), students were tested in more than 70 countries.

PISA tests are designed to capture how well students are equipped to apply academic skills in real-world situations. "The emphasis is on mastering processes, understanding concepts and functioning in various contexts."⁷ Students are asked to compose long-form answers, as well as answer multiple-choice questions. Both parts assess problem-solving skills.

The Teaching and Learning International Survey (TALIS) is a survey of lower-secondary teachers and their school principal. It focuses on school leadership, teacher professional development, appraisal and feedback, and teaching beliefs and practices. In 2008, 24 countries participated in the survey.⁸

⁷ OECD (2010d), p. 20.

⁸ The response rate in the Netherlands did not meet the minimum requirement and so the country's results are not reported.

1.1 Effects of school competition

Evidence of the impact of school competition on performance is highly inconsistent. Most studies find that increasing school competition has a positive, but very small or statistically insignificant effect on school performance. A minority of studies find much larger effects, both positive and negative. Much of this research suffers from methodological difficulties.

Within-country evidence

A number of studies highlight the variation in findings and the generally positive but often small impact of competition on performance. In the United States, a review of 41 competition studies found a positive link between competition and school quality.⁹ However, only about one-third of estimates were statistically significant and these generally showed small effect sizes. Another meta-analysis by Forster (2011) examined the performance impact of voucher schemes in the United States. The studies analysed were classified by the strength of their methodology. Of the ten studies using the 'gold standard' of methodology, random assignment, nine indicated improvement in student outcomes and one indicated no visible effects.¹⁰ The effects of competition were usually small.¹¹

⁹ Belfield and Levin (2002).

¹⁰ Of those nine positive studies, six showed that all students benefit, while in three only some students benefited. An analysis of the wider, less rigorous, literature, still found that the majority of studies found a positive effect of voucher schemes on student performance (Forster (2011), p. 12 and 24).

¹¹ Ibid., p. 1. Results are presented without effect sizes.

In addition to voucher schemes, charter schools in the United States have received considerable attention from competition researchers.¹² A summary of the literature finds that competition from charter schools also has a mixed impact on student performance. Results vary from small positive effects¹³ to mixed effects¹⁴ to negative effects.¹⁵ Teasley (2009) cautions about the potential to extrapolate from the findings on charter schools, given the self-selecting nature of charter school attendance.¹⁶

Hoxby's work provides some of the most consistent positive findings on the impact of school competition.¹⁷ For example, Hoxby (2003) assesses the impact of school choice and competition reforms on both school productivity and achievement

¹² Charter schools are government-funded, privately operated public schools operating in the majority of US states. See summary of research in Teasley (2009).

¹³ Such as a 0.09 s.d. performance boost of increased attendance at a charter school from kindergarten to Year 5. Hoxby and Murarka (2007), cited in *ibid.*, p. 213.

¹⁴ Hanushek, *et al.* (2002) find that different types of charter schools have different outcomes on students: district authorised charter schools have positive effects; state authorised charters have negative effects. Cited in *ibid.*, p. 216. See also Sass (2006) and Booker (2004), cited in *ibid.*, p. 216-217.

¹⁵ Bifulco and Ladd (2005) find charter school attendees in North Carolina perform worse than their public school counterparts. Cited in *ibid.*, p. 217.

¹⁶ When charter schools are oversubscribed they allocate places to students based on a lottery. A random assignment study compares students who entered the lottery and gained a place at the school to those who entered the lottery and did not. Thus, random assignment studies can only be done on oversubscribed schools. This may indicate a selection effect independent of the charter school effect. *Ibid.*, p. 214.

¹⁷ Hoxby (1994); Hoxby (1999); Hoxby (2000); Hoxby (2003); Hoxby and Murarka (2009).

growth.¹⁸ Hoxby compares achievement growth rates (or test results) for elementary schools in Wisconsin that face different competitive pressure with the introduction of a voucher scheme and the introduction of charter schools in Michigan and Arizona.¹⁹ Schools with the most exposure to competitive reforms improved by about seven percentile points in maths compared to about four percentile points in schools facing little or no exposure to the reforms.²⁰ In reading, schools with the most exposure to competitive reforms improved by 0.6 percentile points compared to a decline of 1.4 percentile points for schools facing little or no exposure to reform.²¹ However, a number of studies have questioned the methodology of Hoxby's work.²²

¹⁸ Performance measured by national percentile points per thousand dollars of per-pupil spending (Hoxby (2003) p. 322). Achievement growth measured by the difference in student test results. Students in Wisconsin undertake five tests in mathematics, science, social studies, language and reading. (ibid., p. 319).

¹⁹ Growth rates are the difference between 1996-97 and 1999-2000 test results. Vouchers were available to students from more disadvantaged backgrounds. Schools with a greater proportion of poorer children faced greater potential competition – the schools have more children eligible to receive vouchers allowing them to change schools. These schools therefore faced a greater potential loss of students. Ibid., p. 316.

²⁰ 'Most exposure is classified by Hoxby as 'most treated'. These are schools where at least two thirds of students are eligible for free or reduced price lunches (and thus are eligible for vouchers). (ibid., p. 318). 'Little or no exposure' is classified as 'untreated comparison schools'. These schools are all of the Wisconsin elementary schools that are urban, have at least 25 per cent of students eligible for free lunch and at least 15 per cent of their students being black (ibid., p. 318.) Seven percentile points is statistically significantly different to 'untreated comparison schools' at the 95 per cent level of confidence.

²¹ This is statistically significantly different to 'untreated comparison schools' and schools that faced some, but not as much competition ('somewhat treated schools') at the 85 – 95 per cent level of confidence. Ibid., p. 323. Similarly,

The mixed evidence base has led to what could be termed the next generation of school competition researchers to dismiss the notion that school competition will drive performance in school systems. Instead, they focus on reforms to increase the effectiveness of governance and public accountability arrangements for systems with increased choice and competition.²³

Negligible and small impacts of competition on performance are also evident in a number of countries. Böhlmark and Lindahl (2012) find the positive impact of Sweden's 1992 reforms to increase private provision of education to be small (but may increase over time).²⁴ Ladd and Fiske (2000) find that reforms to increase school competition in New Zealand may have helped some schools, but this came at the expense of other schools, particularly in poorer communities. The result was a negligible effect on system performance.

Hoxby assesses the impact of competition introduced by charter schools in Michigan and Arizona on productivity and achievement growth. Results suggest that Michigan's regular public schools raise their achievement in 4th grade reading and maths by a statistically significant amount for the same level of per-pupil spending following the introduction of charter schools.²¹ Gains were also made for year 7 reading and maths but not at a statistically significant level.²¹ Similar achievement growth results were found for Arizona.

²² Ladd (2003); Rouse and Barrow (2008).

²³ Smarick (2008); Hess (2002).

²⁴ It is also possible that the effects of competition are not linear. That is, a certain density of schools has a positive impact on local schools' performance, but the creation of additional schools beyond that has a different impact on performance. It is not clear if such an effect exists, or at what point it has an impact. Bukowska and Siwińska-Gorzelak (2011).

There is limited and mixed evidence of the impact of school competition in Australia. The research has generally been limited to the use of school sector as a measure of competition. Rowe (1999), controlling for performance in the General Achievement Test, finds that between 1994 and 1999, independent and Catholic schools students scored approximately 0.22 and 0.10 standard deviations higher than students attending Government schools.²⁵

Similarly, Marks (2009) and Vella (1999) find that private schools have a performance advantage over government schools, even when ability and socio-economic status are accounted for. Independent and Catholic school students are more likely to attend university than government school students, even when ability and socio-economic status are taken into account.²⁶

In contrast, Thomson *et al.* (2010) analyse the results of PISA 2009 for the Australian school system. They find that there is no statistically significant difference between students' reading and maths performance in government, Catholic and independent schools, once the socio-economic background of an individual

²⁵ Rowe (1999) cited in Marks (2004).

²⁶ Marks (2009), p. 35, finds that independent students' ENTER scores are nine per cent higher than government schools and Catholic school students' are five per cent higher. Marks (2010) also finds that independent and Catholic school students are almost twice as likely to attend university as students from government schools (p. 33). These results control for socio-economic background and prior achievement. Vella (1999) uses data from the 1985 Australian Longitudinal Survey for Youth to compare school completion for those who did and did not attend Catholic schools. He finds that attendance at a Catholic school increases the probability of completing high school by 17 per cent and increases the likelihood that these students obtain post-secondary qualifications.

student and their peers is taken into account.²⁷ This report highlights that these studies do not analyse competition – school sector is a poor indicator of competition.

Across-country evidence

International evidence focuses on the effects of competition on performance in PISA tests. Some studies find significant positive effects.²⁸ In a prominent example Woessmann *et al.* (2009) used PISA 2003 data and found that competition (as measured by the percentage of private schools, and the level of public funding for private-school students) was associated with significantly higher performance. By contrast, Zimmer *et al.* (2011) used PISA 2006 data and a different measure of school competition (based on principals' perceptions) but found no significant impact on performance. The OECD (2010) reached a similar conclusion.²⁹

1.2 Difficulties in measuring school competition

The variability in the evidence on the impact of school competition on performance partly stems from data difficulties and poor competition indicators. The various indicators that are used in competition research can be grouped into three categories:

²⁷ Thomson *et al.* (2010). Statistically significant differences exist prior to socio-economic status being taken into account: students in the independent school sector achieved significantly higher than those in the Catholic sector who, in turn, achieved significantly higher than those in the government sector. See p. 48, 62, 161 and 201.

²⁸ Woessmann, L., Luedemann, E., Schuetz, G. and West, M. (2009).

²⁹ OECD (2010e), p. 45-49.

1. **System-level frameworks** that identify the extent to which parents are able to choose schools and then move freely between them. Competition is often assessed indirectly by measuring school choice.³⁰ But many indicators of school choice fail to reflect how much school choice actually exists for families. Most OECD countries allow parental choice at all levels of schooling and allow private schools to operate.³¹ However, this general picture lacks detail of what happens in local areas. For example, parents may be allowed to choose schools outside their local area but a range of regulatory restrictions and practical constraints may prevent them from actually getting into the school of their choice.
2. **Presence and accessibility of private schools.**³² On average across OECD countries, 14 per cent of schools are private. In Australia 36 per cent are.³³ More than half of schools are private in Belgium and Chile, but in most OECD countries fewer than ten per cent of schools are.³⁴ There are several problems with comparing these figures. Differences in funding, governance and management mean that a private

school in one country can look very different to private schools in other countries.³⁵

3. **Survey data on the perceptions of choice and competition** that focus on how families choose a school or the amount of competitive pressure school leaders feel. Perception does not always equal reality. Care must be taken in drawing definitive conclusions regarding the actual amount of choice and competition from surveys of students and educators in schools.

In short, school competition is difficult to measure directly. Many indicators have been used, but all have substantial failings. There is a gap in the evidence on how much school competition actually exists.

³⁰ It should be noted that governments can create incentives for school leaders and teachers by rewarding high performance. Such recognition may create a different form of competition in school education.

³¹ OECD (2011).

³² For example, McEwan and Carnoy (2000); Hsieh and Urquiola (2006); Böhlmark and Lindahl (2012).

³³ OECD (2013), Table C1.4 (lower secondary schools are used as these most closely match the analysis in Chapter 2).

³⁴ *ibid.*

³⁵ Woessmann, *et al.* (2009); OECD (2010c).

Box 3: indicators of school competition: Australia's high rankings

Various indicators of school competition have been used to measure the impact on performance. According to these indicators, Australia has a high level of school competition. Figure 1 shows that 36 per cent of Australia's schools are private, compared to an OECD average of 14 per cent. These schools are also made more accessible by government funding. In 2012, Australian governments funded private students at 78 per cent of the rate of public school students (considerably higher than the OECD average, where private students get public funding at a rate equal to 57 per cent of government school students).

Another indicator of school competition is the percentage of students who report that they chose a school for reasons other than it simply being the local school (Figure 2). Here, again, Australia (34 per cent) is well above the OECD average of 25 per cent.

Last, Figure 3 shows that more Australian school principals believe they face competitive pressures from other schools than school principals in any other OECD country.

However, as discussed above, these indicators have numerous measurement problems. A different approach to measuring school competition is presented in Section 2.

Sources: OECD (2012b); (2013), Table C1.4 (Lower secondary was calculated as it most closely matches the analysis in Chapter 2); OECD (2003); OECD (2010b).

Figure 1: Countries with the highest proportion of private schools (top 6 of 65, 2013)

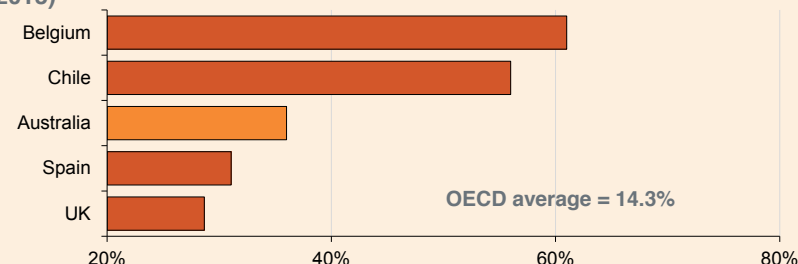


Figure 2: Countries with the highest proportion of students selecting a school for reasons other than it being the 'local' school (top 8 of 40, 2003)

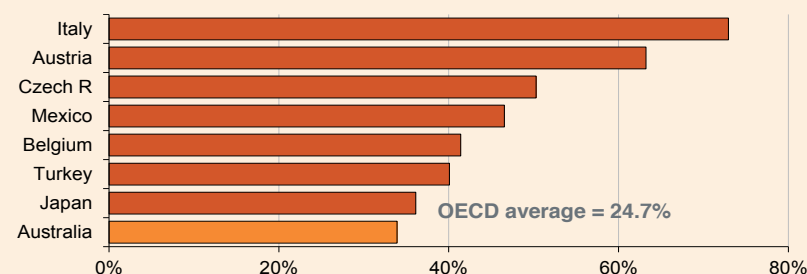
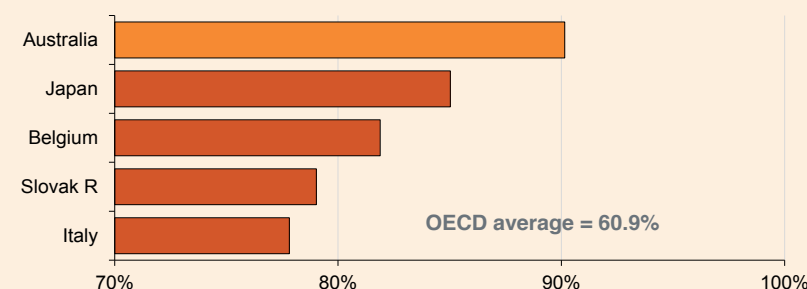


Figure 3: Countries with the highest proportion of school principals reporting that they face competition from two or more schools (top 5 of 65, 2009)



2. Is school education an effective market?

School education research includes many analyses of the impact of various indicators of school competition, but the policy implications are unclear.

Advocates of increasing school competition emphasise the need for private schools to be able to enter the market, for parents to be free to choose between schools, and for schools to feel competitive pressures. Basic indicators show that Australia has all of these in abundance so the amount of school competition should be high. To date no analysis has comprehensively measured the amount of school competition that actually exists. This report aims to address that problem.³⁶

2.1 The school education market

This report is interested in the kind of school competition that will lift performance across a system. Schools may compete in many areas, including buildings, class sizes, extracurricular activities and so on. To increase academic performance across a system, there must be substantial competition on student academic outcomes. This creates the incentive for school leaders to improve academic performance in their schools.

This report focuses on competition where families can move to higher performing schools or ones that are at least as high-

³⁶ We focused on schools in South East Queensland as this was the only region where there was sufficient publicly available data to complete the analysis.

performing. To measure school competition the number of schools that face competition from other schools was measured. This was done by measuring for each school:

1. How many schools are in its local market?
2. How many of them are performing at a level as high as or higher than the school being measured?
3. How many of them are already at their enrolment capacity?
4. How many of them charge school fees, and what percentage of families in each school market can afford those fees?

By answering these questions it is possible to measure which schools face competition from other schools.

Box 4: Departing from previous research on school competition

Previous research has tried to measure the impact of competition on school performance. But competition is difficult, if not impossible to measure in a simple indicator. Quantitative studies and regression analyses that use these simple indicators are therefore limited. This analysis departs from the typical use of poor indicators of school competition, by conducting an analysis of local school markets, school performance, affordability, capacity, and enrolment patterns. These real-world factors are often ignored. It is only through this approach that it is possible to observe the current amount of school competition and its potential to drive performance in school systems.

According to the data, a conservative estimate of the amount of competition in school education markets is that between 43 and 60 per cent of schools face no or very little competitive pressure from other schools. Under plausible but less conservative assumptions, the percentage of schools facing limited or no competition may be as high as 81 per cent.

The analysis does not include other factors that affect school choice, such as the religious orientation of a school. Lack of data prevents this analysis. However, it is clear that if these elements were incorporated into the analysis then the percentage of schools facing no or very limited competition would substantially increase.³⁷ This explains why school competition is not a policy lever to significantly improve learning and teaching.³⁸

2.2 How was this conclusion reached?

Several analyses to measure competition in school education markets were undertaken. These are discussed in detail in Appendix A and are briefly detailed below.

³⁷ Another important factor for many families that we cannot include in our analysis is if siblings attended a particular school. This normally eases the entrance requirements to a school. This can have two opposing effects: for younger siblings it can broaden their school choice if they can enter a school because of their older sibling that they would normally not be able to attend. But this may reduce accessibility for other students who would like to attend the school.

³⁸ These results relate to SEQ, but indicators suggest this area is representative of other metropolitan areas in Australia (see Appendix A).

1. How are local school education markets defined?

Competition exists only when families can and will choose other schools. If a better school is too far away then not enough families will move to create competition.³⁹

Data limitations meant the focus was on secondary schools in South East Queensland (SEQ).⁴⁰ It is a significant metropolitan area, containing the three large urban areas of Brisbane (population: 2.1 million), Gold Coast (591,000) and Sunshine Coast (285,000).⁴¹ SEQ is representative of school competition in growing metropolitan areas across Australia and many other countries (see Appendix A for a more detailed discussion of the SEQ secondary school market). Schools in this area are broadly

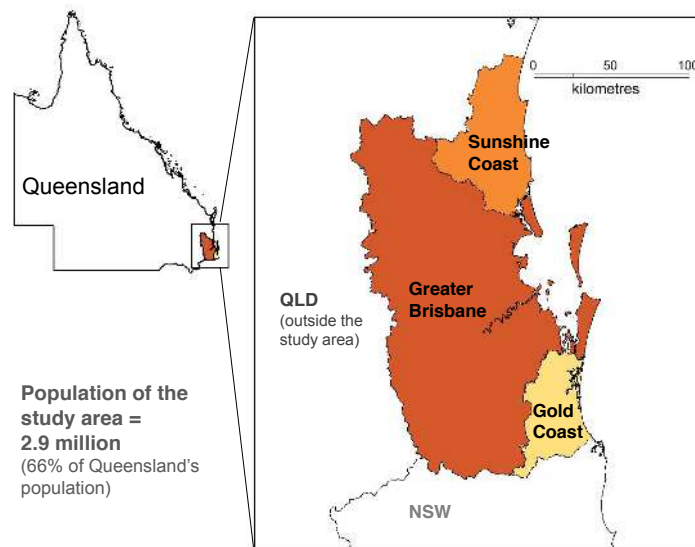
³⁹ The Australian Competition and Consumer Commission's guidelines for analysing the competitiveness of markets asserts that "in cases where only a small proportion of sales is likely to switch (following a change in price, service or quality), the alternative product or geographic region is not part of the relevant market." (Australian Competition and Consumer Commission (2008), p. 17) That is, if not many families will switch to another school, then the market is not functioning as a single competitive market. Further geographic implications for market competitiveness include the costs and related constraints of moving, establishing, or expanding schools to different geographic locations; the costs to students and families of moving to a school in another geographic location; limitations on families in accessing schools in other geographic locations (i.e. school boundaries operate as a severe limitation on the competitiveness of the school education market); regulatory and practical constraints in operating schools in different locations; and relative price levels in different locations.

⁴⁰ We assume that differences in travel patterns, size of schools, and willingness to pay school fees would be different for primary school education. We therefore caution against extrapolation of our findings for secondary schools to other levels of education.

⁴¹ Australian Bureau of Statistics (2013), Population Estimates by Significant Urban Area, Table 1.

representative of the average Australian metropolitan school, although they do tend to be slightly bigger than the Australian average.⁴²

Figure 4: Geographic area of the analysis



Source: Queensland Department of Transport and Main Roads (2009); ABS Census2011

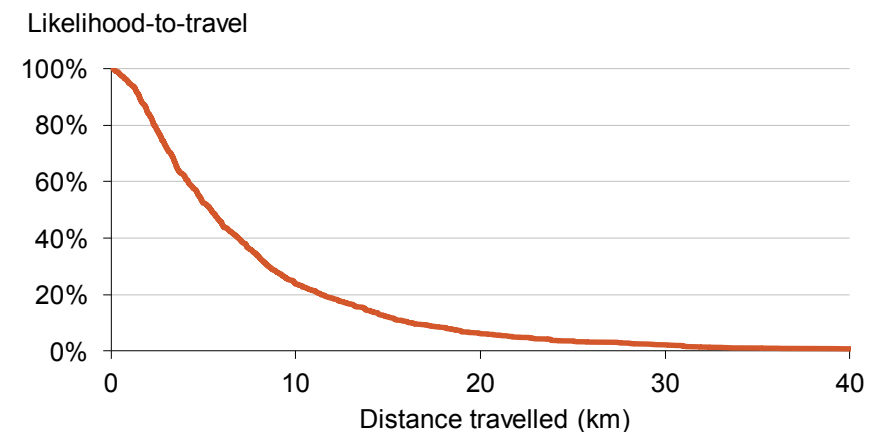
Markets for school education are more local than those for other industries and sectors.⁴³ Figure 5 depicts school commuting patterns in SEQ and shows that nearly 80 per cent of people

⁴² See Table 4 in Appendix A for a comparison of SEQ and the rest of Australia.

⁴³ See Woods, et al.(1998) and Bell (2009).

travel less than ten kilometres to their school.⁴⁴ The conservative assumption was made that a school's local market is defined by the distance that 95 per cent of families travel for education – that is, by a boundary that extends 21.7 kilometres around each school in the case of SEQ. We believe the boundary would be smaller in bigger cities with greater population density, but conservative assumptions are preferred for the analysis of this region. We then identified which schools were in each school education market.

Figure 5: Likelihood that current school commuters travel at least a particular distance



Note: This function is essentially (1 minus the CDF of Figure 13)Source: Queensland Department of Transport and Main Roads (2009)

⁴⁴ Most studies find that students attend their local school (See Chumacero, et al. (2011) and Noailly, et al. (2012)). An English study of school choice found that the median distance primary school children travelled to school was 743m. (Gibbons, et al. (2008) .

2. How do we define how schools are performing?

Given the focus on secondary schools, school performance is defined as the average score on NAPLAN national assessments for Year 9 students (across all domains, for 2008-2011).⁴⁵ A school is defined as 'at least as high-performing' as another school if its average Year 9 score was greater than or equal to the other school over that period.

It is hard to know how parents evaluate schools using performance data. Some people may be interested in raw scores, while others may value performance that is high compared to similar schools. Based largely on evidence from the UK, we assume that parents and students focus more on absolute achievement, as opposed to similar school scores.⁴⁶

Clearly, people will choose schools based on factors other than performance (see Section 3). We do not disregard these factors. But if school competition is to increase learning and teaching across a system, then competition must be based on school performance.

⁴⁵ That is, for schools that had reported Year 9 NAPLAN scores in each round of testing, the measure of performance was taken to be the average of the 20 scores (4 years, 5 domains). This data was sourced from the *My School* website (Australian Curriculum Assessment and Reporting Authority (2013a)).

⁴⁶ See Coldron, *et al.* (2008). Using raw achievement as opposed to a measure of value-added appears to be the rational choice for parents interested in maximising their child's test scores, as illustrated in Allen and Burgess (2011). See also MacLeod and Urquiola (2009).

3. How do we know if schools are already at capacity?

The capacity of each school to accept more students was made available by the Queensland Department of Education.⁴⁷ For private schools, we emailed surveys and conducted phone interviews.⁴⁸

Many parents will be familiar with schools being full or having strict zoning requirements (that mean children can only attend a school if they live in a specified local area). In many cases, the zoning requirements are a response to being full (or nearly full).

4. How did we measure households' willingness to pay school fees?

Data on school fees was obtained from individual school websites and the *My School* website. We then developed a measure of willingness to pay school fees for each household. For every observed level of private school fees, we calculated the proportion of people who currently pay at least that figure in fees (for a range of income brackets).⁴⁹

We assumed that if ten per cent of its students can potentially enrol in a competitor school then a school is considered to face

⁴⁷ To download the data, see Department of Education Training and Employment (Qld) (2012).

⁴⁸ 54 (out of 128) private schools did not respond to the survey. We imputed 'at capacity' status for respondents, based on a simple probit model that is discussed in Appendix A.

⁴⁹ Wave 10 of the Household, Income and Labour Dynamics in Australia (HILDA) was used to estimate the relationship between household income and the level of spending on education.

competition from other schools. We are unsure how many of the potential ten per cent would actually choose another school. It may be zero or only two to three per cent, in which case the school may face little competition. We have chosen to be very conservative in the assumptions, since we cannot accurately measure these market failures.

2.3 An example of a school education market

To illustrate the analytical method used to reach these findings, we present an example of the analysis using a randomly chosen school (School X) in SEQ. We found that School X has local competitors that are at least as good, and not at capacity, and that its nearest competitor is sufficiently close and affordable for a 'significant' proportion of its catchment to consider this option.

There are 25 schools in this school education market and, through the following analytical steps, it was found that School X faces competitive pressures:

1. The local market for this school was defined by the 95th percentile of commuting distances (21.7 kilometres).⁵⁰ See Table 10 for a listing of School X's competitors' information.
2. We calculated the likelihood that people would be willing to travel from this school to each of the 25 schools in the local market. We assume that, for example, a school located 19

kilometres away is less likely to present a competitive threat than a school three kilometres away.⁵¹

3. Fourteen of the 25 schools were at least as high-performing according to national assessments.
4. Of the 14 schools that were at least as high-performing, only four had capacity to accept new students.
5. We built household income profiles to analyse the likelihood that a family that can at least afford to attend School X can afford each competitor school. For example, we estimate that a typical household in this school education market would have a 19 per cent likelihood of being willing to pay the \$18,232 p.a. to attend the most expensive school in the market.⁵²
6. Final analysis for this school

Table 1 shows the number of competitors that the school faces. Four schools in School X's local area are at least as high-performing and have spare capacity.

⁵⁰ See Appendix A for the whole distribution.

⁵¹ School commuting data shows that only seven per cent of families are willing to commute 19km to attend the school of their choice (Queensland Department of Transport and Main Roads (2009).

⁵² More detailed discussion of the statistical analysis of these assumptions and their impact on the analysis is presented in Appendix A.

Table 1: Number of competitors facing School X

<i>Schools</i>	<i>Number</i>
All competitors	25
Competitors that are at least as high-performing	14
Competitors that also have spare capacity	4

- The probability that households would commute the distance from School X to the closest of the four schools was 26 per cent.
- The probability that households in the market would be able to pay the fees of the closest of the four schools was 49 per cent.

The product of these two numbers is 12 per cent, which means that the most likely competitor school is only a viable option for 12 per cent of families in School X's core local market. This exceeds the nominal threshold (ten per cent) of whether or not a school stands to lose a significant proportion of its enrolment. Consequently, School X was deemed to be facing competition.

These analytical steps were then undertaken for every secondary school in SEQ (see Appendix A).

2.4 Different policy settings

To make the analysis more relevant to policy makers we analysed what would happen under various policy reforms to increase school competition and different assumptions about school education markets. We tested what happens to school competition if:

1. Schools are only competitors if they are higher performing schools.

This report uses the conservative assumption that a school is a competitor when it is at least as high-performing as another school. If systems want to improve, families need to have the choice to move to higher performing schools.

If the focus is on competitor schools that perform at a level 'above' the school under analysis, then the percentage of schools facing no competition increases to 63 per cent.⁵³ This increases to 81 per cent if the focus is on schools that perform 'substantially above'.⁵⁴

2. Families will not travel 21.7 kilometres to another school.

This report makes the conservative assumption that each school's local market extends to 21.7 kilometres from the school (the 95th percentile of observed school commuting distances).

This may overestimate the size of each school's local market. More than half of people travel only 5.6 kilometres to get to school. If it is assumed that local school education markets extend only that distance then 74 per cent of schools are

⁵³ Our definition of 'above' is aligned with the *My School* website's definition. A school receives an 'above' (pale green) rating if it is greater than 0.2 standard deviations above a comparator school or benchmark (ACARA). This is used in combination with the distribution of results in NAPLAN's 2011 Year 9 testing (NAPLAN (2011), by way of example, see p. 194 for reading) .

⁵⁴ Once again our definition is aligned to the *My School* website. See above footnote for sources.

assessed as not having a viable competitor. In other words, if people will only travel about five or six km to school, then almost three quarters of schools have no competitor.⁵⁵

3. Fewer families actually move to better schools.

In this analysis, the conservative assumption is that schools face competitive pressure if ten per cent of households in a school's local market could choose the nearest competitor school. But Chapter 3 shows that families do not often move based on (NAPLAN) performance.

The ten per cent figure does not represent the proportion of current or potential students who actually would choose a competitor school. The percentage of people in the market who actually choose a different school is likely to be much lower. We therefore believe that the ten per cent figure is a very conservative threshold.

The effect of changing this ten per cent threshold is illustrated in Table 14 in Appendix A.

⁵⁵ Conversely, if we made the assumption that a school's local market extended 35km in every direction from the school, then only 42 per cent of schools face little or no competitive pressure. The dual impact of the 'local area' and 'clearly better' assumptions are discussed in Appendix A.

3. Can governments improve the effectiveness of the market?

A lack of competitive pressure in markets often leads to government interventions to address market failures and improve the functioning of the market.⁵⁶ But in school education governments have few viable options to increase competition to improve performance.

3.1 Addressing demand-side constraints in the school education market

In Australia, government regulations do not overly restrict school choice. In some countries – including high performers Finland, Japan and Korea – regulatory barriers limit choice.⁵⁷ Australian parents have the right to choose a school in the government, Catholic or independent school sectors. But once families have the right to choose a school, many factors influence that choice.

Schools are an experience good; the quality of a school can only be fully ascertained after the initial decision to attend. This increases uncertainty in school choice.⁵⁸ Data, including from the OECD, shows that parents most value the school environment (which includes school discipline) and reputation above academic achievements.⁵⁹ Subject offerings are also important, as are geography, cost, religious philosophy and family connections. In

one Australian survey, 82.4 per cent of parents said that they were influenced by school facilities and grounds.⁶⁰

Families' choices should be respected. However, this does not imply that school performance will increase as a result. With so many factors driving school choice, schools have the incentive to invest in the numerous areas that attract families. It is therefore hard to determine the extent that school choice and competition can drive performance.

A further complication is that changing schools can be costly. It can also affect the educational performance of students.⁶¹ Classes work at different paces and often cover different topics, so children moving from one school to another might struggle to catch-up with their new peers, or find they are repeating material they have already learnt.⁶² Known as transaction costs, these downsides to switching schools reduce the effectiveness of the school education market by reducing the ease with which parents can choose to change their child's school.

⁵⁶ Australian Competition and Consumer Commission (2008).

⁵⁷ OECD (2011), Table D5.5.

⁵⁸ Horner (2002), p. 644.

⁵⁹ West (1992); Weston (1998); OECD (2010a), p. 57; Independent Schools Queensland (2011), p. 10; Ball, *et al.* (2006); Campbell, *et al.* (2009); Bosetti (2004).

⁶⁰ Independent Schools Queensland (2011), p.7.

⁶¹ Changing schools is associated with a decline in achievement, with low income and minority students tending to struggle more. See Sorin and Iloste (2006), p. 229, p. 235; Ingersoll, *et al.* (1989); South, *et al.* (2007); Strand and Demie (2007), p. 323; Grigg (2012), p. 389.

⁶² Lash and Kirkpatrick (1990), p. 178, p. 186; Sorin and Iloste (2006), p. 235.

3.2 Increasing information to increase school competition

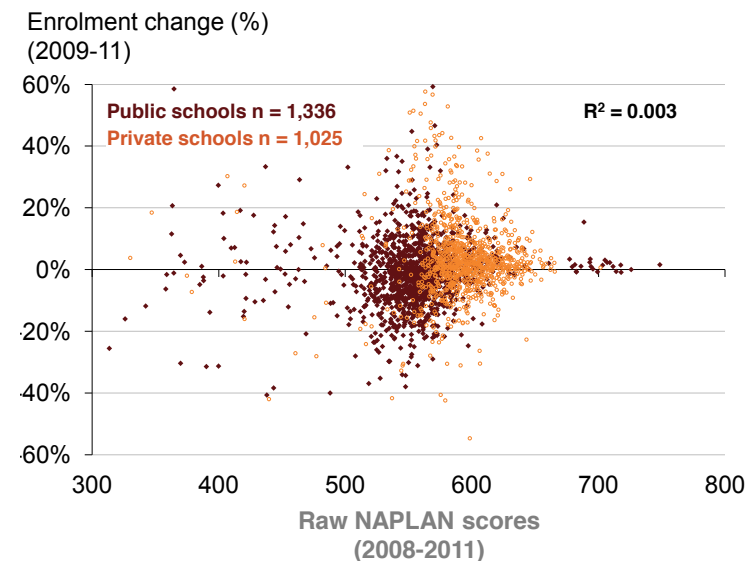
To address these constraints, many governments around the world have made school performance information public, to improve information and reduce costs in finding better schools.

The *My School* website allows families to compare the performance of all Australian schools and to make direct comparisons between similar schools (as measured by socio-economic status) and local schools.

Yet for this intervention to improve school competition, and for competition to improve performance across the system, more students would need to choose higher performing schools and leave (or choose not to attend) lower performing schools. While *My School* has substantially increased transparency and the focus on key learning areas, the results show that by and large this shift in enrolment has not occurred.⁶³

Figure 6 shows that there is at most a very weak relationship between NAPLAN scores and enrolment. An increase in NAPLAN scores of 36.6 points (which is 'substantial' difference according to the *My School* website) translates to a higher enrolment growth rate of only 0.7 per cent each year.⁶⁴

Figure 6: Enrolment change and performance on national assessments (Australian schools 2009-2011)



Note: average across all domains, y-axis constrained at absolute change of 60 per cent, meaning there are 25 data points not shown on this chart.

⁶³ This analysis was completed before the release of full NAPLAN results for 2012. Therefore, they could not be included in the analysis.

⁶⁴ This represents the smallest gap required for the *My School* website to indicate that one school is performing 'substantially above' a benchmark. A school receives a 'substantially above' (dark green) rating if it is greater than 0.5 standard deviations above a comparator school or benchmark (ACARA). This is

used in combination with the distribution of results in NAPLAN's 2011 Year 9 testing (NAPLAN (2011) e.g. see p. 194 for reading scores).

Box 6: What is *My School*?

The *My School* website was a significant increase in transparency in Australian school education. It provides a school profile, finance information, course offerings, a list of schools in the local area, and performance on standardised assessments compared to all schools and statistically similar schools. The OECD considers it a high-quality innovation in transparency and in making information available to families.⁶⁵

The same finding holds if similar schools are compared. Many systems around the world have struggled with how to fairly compare schools with different student populations. Some focus on value-added models that control for students' socio-economic background and some use a variety of statistical techniques to account for differences.⁶⁶ Others, including Australia, try to compare similar types of schools.⁶⁷ Parents can compare their school's performance to schools with similar student bodies (based on socio-economic status). But this new information does not increase competition in a way that improves performance.

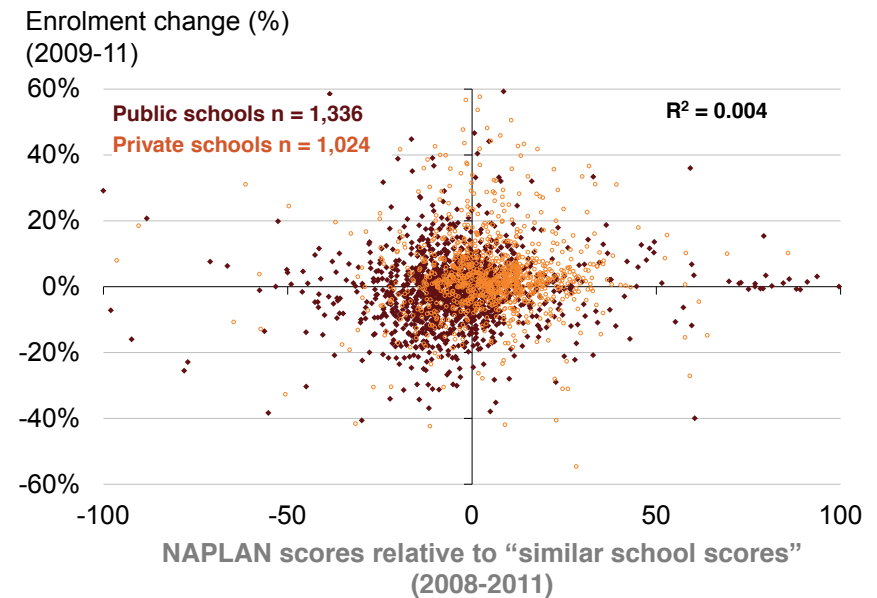
Figure 7 shows again that there is only a very weak positive relationship between enrolment change and performance (even when controlling for a school's socio-economic status). There are high-performing schools that are shrinking and there are low-performing schools that are growing rapidly.

⁶⁵ OECD (2012a).

⁶⁶ OECD (2008).

⁶⁷ Ibid., p. 14-15.

Figure 7: Enrolment change and performance on national assessments compared to similar schools (Australian schools)



Note: average across all domains; x-axis constrained at absolute value of 100, and y-axis constrained at enrolment changes of 60 per cent which means 34 data points are not shown on this chart.

Local schools

School education markets are local. Competition should be at its greatest in local markets where families can most easily move to higher performing schools. Figure 8 explores this by plotting enrolment change against a measure of relative local performance (i.e. a school's score compared to the average of its

local competitor schools). The relationship is slightly stronger than that presented in Figure 6 and Figure 7 but it remains weak.⁶⁸ Schools performing significantly above the local average (i.e. with a score at least 14.6 points higher than the local average) grow less than one per cent faster than other local schools.

The absence of movement between local competitors adds further weight to the competition estimates presented in Chapter 2. It shows why policies designed to increase school competition will have little impact on school performance.

3.3 Addressing constraints in the supply of education

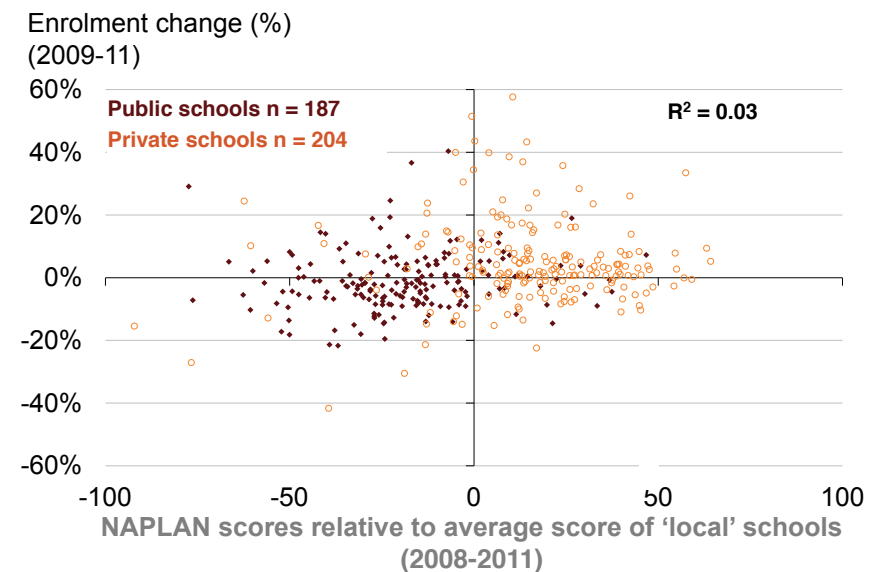
Governments may make supply interventions to increase school competition. Interventions to reduce capacity constraints and private school fees are analysed below. These interventions, too, will yield little increase in school competition.

3.3.1 Substantially reducing capacity constraints

Physical barriers prevent schools expanding; classrooms and buildings will only hold so many people. Regulations and class size constraints could be loosened to allow high-performing schools to accept more students.

⁶⁸ Data constraints in other states mean only schools in Queensland were analysed. 'Local' is defined as a 21.7km radius around each school (the 95th percentile of distances travelled to school – further explanation in Appendix A).

Figure 8: Enrolment change and performance on national assessments compared to local schools (Queensland schools only)



Note: average across all domains. 'Local' is defined by a 21km radius around each school. Schools with no 'local' comparator are not shown on this chart.

To return to the school education market in SEQ, removing capacity constraints in every government school would be a large, costly reform. Even then, the reform would not substantially change the competition landscape, reducing the percentage of schools that face no or limited competition from 43 to 30 per

cent.⁶⁹ While the prevalence of capacity constraints in government schools is a problem, addressing the problem will be expensive and is unlikely to produce competition across the system.

There are a variety of reasons why this major change doesn't have more of an impact. First and foremost, school markets are local. Although people's preferences for school commuting may change if very high quality but distant public schools opened their doors, it would still likely be the case that many people would not be able or inclined to access them. Second, a majority of the high-performing schools that might offer competition are private (and so remain unaffected by the change). Last, high performing government schools are often in areas where there is already more competition (which means that increasing capacity will, at the margin, result in a less impressive increase in the number of schools facing competition). This illustrates the fact that, while capacity constraints in government schools are problematic, addressing this issue will not fuel system-wide competition.

3.3.2 Substantially reducing private school fees

Reducing private school fees to allow more students to attend these schools might also increase competition. Yet once again, even a dramatic shift would do surprisingly little to increase the number of schools facing competition. Halving private school fees in the form of a direct subsidy or voucher would be extremely costly. Yet this reform would only reduce the percentage of

⁶⁹ This assumes that each school's local market is 21.7km around each school, and with schools assumed to be competitors if they perform at least as highly performing as other schools. See Appendix A for more detail on the change in competition under different assumptions.

schools that face no or limited competition from 43 to 33 per cent.⁷⁰ It is not the cost of private schools that is responsible for low levels of school competition.

3.4 Why can't government do more to increase competition?

A number of additional market failures in school education illustrate why competition is so scarce. Four of the most important are: the absence of market prices; the failure to close low-performing schools; externalities; and, principal-agent problems.

3.4.1 Market price and learning and teaching in schools

For any market to operate effectively, price needs to balance supply and demand. When price becomes distorted it no longer reflects quality and market efficiency is often dramatically reduced.⁷¹

Price is often completely absent from the school education market meaning a competitive market equilibrium is not reached. Government schools cannot use price to clear demand because they cannot raise fees to market-clearing prices because school education is widely considered a social good.⁷² Free education has long been common in most countries. Parents expect it.

⁷⁰ This assumes that each school's local market extends 21.7km around each school, and with schools assumed to be competitors if they perform at least as highly performing as other schools. See Appendix A for more detail on the change in competition under different assumptions.

⁷¹ Hilmer, *et al.* (1993), p. 4.

⁷² Hess (2002).

What about private schools? Most are not-for-profit organisations and have the explicit aim of keeping fees low. This aim is at odds with a competitive market. Private schools usually maintain long waiting lists rather than increasing fees to clear waiting lists and set a ‘market price’.

When price is not an indicator of quality, price does not inform consumers or provide sufficient incentive to schools to improve the quality of learning and teaching to attract more families.

3.4.2 Poorly performing schools don’t close

Not only do poorly performing schools not close and exit the market, they often sustain and even grow their enrolments. This makes it hard for potential new schools to enter the market, and probably reduces the number of new entrants given large start-up costs.

Closing a school can also be politically costly. People often view their local school, no matter how poorly it is performing, as the heart of their community. In 2011, the Tasmanian Government announced it had a list of 20 schools it believed were no longer viable and would need to demonstrate their capacity in order to continue operation. The Government, facing a budget shortfall, estimated the closure of these schools could save \$24 million a year.⁷³ But the political backlash was severe. Eventually, the

⁷³ ABC News (2011).

Government announced that no Tasmanian schools would close before the next election.⁷⁴

It is also not easy to close a private school. Governments quickly become accountable if one gets into difficulty. A media backlash followed the sudden closure of three private schools in Victoria last year. For example, Mowbray College, in the Melbourne suburb of Melton, closed in June 2012 after accumulating up to \$18 million in debt. The announcement of the imminent collapse prompted emotive media stories; a video circulated online of two young boys begging the government to keep their school open.⁷⁵ Governments shoulder costs even when private schools close.

3.4.3 Externalities

There are strong peer effects in education; the performance of students influences their peers.⁷⁶ This means that when a family chooses a school they are influenced by the type of students in the school rather than strictly by school performance (that may or may not reflect the peer group). This means that decisions in the school education market can become further removed from issues of school performance.

⁷⁴ The Tasmanian Government also established a ‘School Transition Fund’ to “encourage innovation within school communities by supporting those schools that wish to voluntarily close, co-locate, federate or amalgamate.” The government has committed \$3.5m over 2 years. More than a dozen Tasmanian schools are now in talks to close or merge, most not on the original list of scheduled closures. (Department of Education (Tas) (2012)).

⁷⁵ Humpage and Mawby (2012).

⁷⁶ Borjas (1998).

In other markets, prices can be regulated to better address such externalities.⁷⁷ Yet market prices rarely exist in school education. School funding models can recognise the impact of peer effects by increasing equity funding for schools serving poorer communities. This may increase competition in some instances, but it is more likely to make schools more equitable than to increase competition.

3.4.4 Principal-agent problems

Some schools, particularly those struggling for enrolments, clearly have incentives (sometimes financial) to attract more students. But learning occurs in the classroom, and teachers have very limited financial incentives to attract more students to their school.

Rewards for teachers, such as promotion, extra pay, bonuses and recognition, are not related to school competition. A teacher will improve, or not, regardless of whether they work in a competitive environment.

Some suggest that competitive incentives are strong for teachers, because their fates can be tied to that of the school.⁷⁸ However, as this report shows, school enrolments are not closely tied to school performance, substantially reducing incentives for most schools to invest in raising teacher performance.

⁷⁷Lazear (2001).

⁷⁸Hoxby (1994), p. 6.

4. Increasing school autonomy

School autonomy is not a new concept in Australia. The argument in favour of it goes back at least as far as the 1973 Karmel Report:⁷⁹

Responsibility will be most effectively discharged where the people entrusted with making decisions are also the people responsible for carrying them out, with an obligation to justify them, and in a position to profit from their experience.

4.1 Why school autonomy can be beneficial

A number of arguments have been made in favour of autonomy:

1. **Schools have local knowledge:** School leaders know more about their school than a centralised authority does. They can therefore make more informed decisions.⁸⁰ For example, a school principal is better placed to know which teaching applicant will be a good fit for the school.
2. **Each school must respond to its specific circumstances:** Central policies designed for all schools may not be the best fit for individual schools.⁸¹ Avoiding bureaucratic processes may allow schools to be more responsive to solving their specific

problems.⁸² In addition, school autonomy can help empower school leaders to develop the policies that best improve learning and teaching in their specific school.⁸³

3. **Autonomy allows schools to experiment and find what works:** Innovation can increase as school leaders use their greater freedom to come up with new solutions and programs.⁸⁴ Innovation means that more schools operate differently, providing families with more school choice.⁸⁵
4. **Using local information can lead to more efficient outcomes:** Budgets developed at a central government level can increase costs when all schools are forced to spend money the same way. School autonomy over budgets can lead to more specific expenditures that better suit each school, with fewer resources spent on non-essential items.⁸⁶
5. **Schools will become more accountable for outcomes:** Autonomous leaders often feel more responsibility for school performance. For example, a school autonomy pilot program

⁷⁹ Karmel (1973) p.10.

⁸⁰ See, for example, Woessmann, *et al.* (2009); Hoxby (1999); Caldwell and Spinks (2008); Nous (2011), p. 151.

⁸¹ Chubb and Moe (1990), p. 14; Angus and Olney (2011), p. 11-12.

⁸² Hugh Watson Consulting (2004); Caldwell and Spinks (2013); Australian Teacher Magazine (2012b); Australian Teacher Magazine (2012a); Department for Education (England) (2013).

⁸³ Caldwell and Spinks (2008).

⁸⁴ Hargreaves (2010); Hargreaves (2012); Greene, *et al.* (2010), p. 6; Witte (1990), p. 39; Nous (2011) p.151.

⁸⁵ Witte (1990), p. 38.

⁸⁶ Woessmann, *et al.* (2009), p. 36; Odden and Busch (1998); Clark (2009).

in NSW found that many principals understood the accountability that came with greater autonomy.⁸⁷

- 6. Autonomy should foster a sense of ownership in school management:** Greater school autonomy and accountability can engender a strong sense of ownership among staff. Ownership can increase innovation and effective reforms in schools.⁸⁸

4.2 School autonomy is complex

School autonomy is more complex than is often portrayed. It is not the case that a school simply has autonomy or does not. Schools have different levels of autonomy over different aspects of decision-making. This complexity is one reason research findings vary on the impact of school autonomy on student performance.⁸⁹

The OECD identifies four areas of school autonomy: staffing; budgeting; student policies; and, curriculum and assessment autonomy. Schools in different countries are given very different amounts of autonomy across each aspect of decision-making.⁹⁰

Australian principals often cite autonomy over staffing – including the power to hire and fire, and set salaries – as the most important domain of decision-making in which they need autonomy.⁹¹ Yet across the OECD, it is this area where there is

often the least amount of autonomy.⁹² This leaves significant scope for reforms that devolve staffing decisions to schools.

Large differences exist among schools sectors within Australia. Generally, government schools have less autonomy than Catholic schools, which have less autonomy than independent schools. Among states, Victoria has gone furthest down the path of autonomy.⁹³ Other states are following Victoria's lead and narrowing the gap between government and private schools. Recent reforms in WA, NSW, SA, and the ACT have all increased school autonomy.⁹⁴

4.2.1 School autonomy and performance

There is no doubt that some schools will excel with increased autonomy.⁹⁵ They will innovate and reform schooling in numerous ways.⁹⁶ School autonomy can also lead to reforms that improve practices in classrooms.⁹⁷ Much of this research does not claim that a causal direct link exists between school autonomy and student performance. Instead, it emphasises the advantages of school autonomy as part of a comprehensive strategy for school and system improvement.⁹⁸

⁸⁷ Department of Education and Communities (NSW) (2011) p.26.

⁸⁸ Triant (2001) p.4; Hargreaves and Hopkins (1991), p. 7; White (1992), p. 76.

⁸⁹ See, for example, Hanushek, *et al.* (2011) and Woessmann, *et al.* (2009).

⁹⁰ OECD (2010f).

⁹¹ McKenzie, *et al.* (2011), p.106; Department of Education and Communities (NSW) (2011), p. 21.

⁹² OECD (2010b).

⁹³ Keating, *et al.* (2011) p.31.

⁹⁴ See *ibid.* p. 31; Department of Education (WA) (2012a); NSW Public Schools (2012); Productivity Commission (2012) p. 242; Department of Education and Training (ACT) (2011).

⁹⁵ Caldwell and Spinks (1992) Caldwell and Spinks (1998) .

⁹⁶ Hargreaves (2010); Hargreaves (2012).

⁹⁷ Caldwell and Spinks (2008).

⁹⁸ See for example, Caldwell and Spinks (In press). This conclusion is not contradicted by the findings of this report that shows the lack of an impact on

At a broader level, both within-country and cross-country quantitative research suggests that the direct gain produced by increasing autonomy is relatively small.

A large number of studies have examined the impact of varying levels of school autonomy within countries. Results in the literature differ quite widely, making it hard to generalise from them.⁹⁹

In England, numerous studies have produced varied findings of the impact of increasing school autonomy.¹⁰⁰ Small positive relationships are evident in some studies. For example, Machin & Vermont found in 2012 that schools that had become autonomous school academies between 2001 and 2008 increased achievement by about 0.2 of a standard deviation.¹⁰¹ In 2009 Clark found that school communities in England that voted to increase their autonomy had a slightly higher increase in student performance compared to those communities that narrowly decided not to increase their autonomy.¹⁰²

school reform when school autonomy is not supported by other policies such as a clear strategic direction to improve learning and teaching, capacity building in schools, and high-quality leadership development.

⁹⁹ Victorian Competition and Efficiency Commission (2013).

¹⁰⁰ Gorard (2009); National Audit Office (UK) (2010); Allen (2012); Academies Commission (2013).

¹⁰¹ Machin and Vernoit (2012).

¹⁰² Clark (2009).

Box 8: Victoria's long path to school autonomy

Two decades ago the *Schools of the Future* policy started Victoria's march to high school autonomy.¹⁰³ Autonomy over staffing increased and schools gained control over 93 per cent of the state's education budget to spend on what they needed.¹⁰⁴ In 1998, the Self-governing Schools program gave some schools even greater powers. The program was subsequently ended but Victoria remains one of the world's most autonomous systems.¹⁰⁵

Despite this, Victoria's performance on national and international assessments is not significantly different from NSW, where autonomy is much lower. Scores in NAPLAN follow similar trends.¹⁰⁶ In PISA 2009, NSW outperformed Victoria in reading literacy and the states scored equally in mathematical literacy.¹⁰⁷

In the 'Trends in International Mathematics and Science Study' and the 'Progress in International Reading Literacy Study', there were no significant differences in the latest assessments of maths, science, and reading literacy for Year 4 students. Year 8 students in NSW outperform Victoria in science and maths.¹⁰⁸

¹⁰³ Dixon (2011); Victorian Competition and Efficiency Commission (2012).

¹⁰⁴ Hinz (2010).

¹⁰⁵ Productivity Commission (2012); Dixon (2011).

¹⁰⁶ NAPLAN (2008); NAPLAN (2009); NAPLAN (2010); NAPLAN (2011); NAPLAN (2012).

¹⁰⁷ Thomson, *et al.* (2010), p. 58 and 184.

¹⁰⁸ These results are from the TIMSS and PIRLS studies. See Thomson, *et al.* (2012).

In the United States, meta-analyses that review the literature on the impact of granting schools extra autonomy have produced varied findings.¹⁰⁹ Individual studies reflect this variation. For example, Hoxby & Murarka compared the performance of students who won a lottery to enter a charter school in the United States with those who lost the lottery and stayed in a public school.¹¹⁰ They found that the students who moved to charter schools increased their performance by 0.04-0.09 standard deviations. The authors attributed much of the increased student performance to a longer school year in charter schools.¹¹¹ Other studies have found no impact on student performance of the increased autonomy available to charter schools.¹¹²

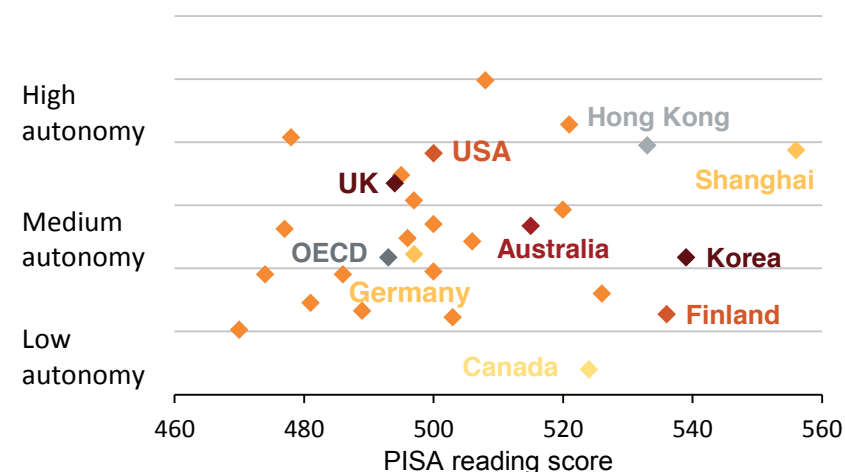
Across country evidence

The level of autonomy in a country's schools is not consistent with how well they perform internationally. Figure 9 shows the weak correlation between PISA scores and level of autonomy. Higher performing countries lie on the right of the chart and have levels of autonomy ranging from high (Hong Kong and Shanghai), to low (Finland and Canada) and anywhere in between. Korea and Australia have similar levels of autonomy, but Korea considerably outperforms Australia in PISA tests.

Figure 9 shows the relationship between performance and the average level of school autonomy across all decision-making domains. Analyses that isolate the relationship between specific

types of school autonomy and PISA performance find that schools with autonomy over curriculum and assessment matters tended to have higher scores. In contrast, there is no significant relationship between performance and autonomy over resource allocation.¹¹³

Figure 9: Performance in PISA 2009 and level of autonomy in the system



Note: the level of autonomy was calculated using an average of the various domains of autonomy collected by the OECD.

Source: OECD (2010b); OECD (2010d)

¹⁰⁹ Miron, *et al.* (2008); Betts and Tang (2011).

¹¹⁰ Hoxby and Murarka (2009).

¹¹¹ Ibid.

¹¹² Raymond (2009).

¹¹³ Correlation coefficient of school responsibility for curriculum and assessment and reading performance: 0.49. Correlation coefficient of school responsibility for resource allocation and reading performance: 0.03. (OECD (2010c), p. 44).

Other analyses of PISA data have produced some positive findings. For example, Hanushek, *et al.* (2011) find a positive relationship between student performance and school autonomy over academic content and resource allocation decisions. But the OECD (2010) finds a positive impact only for autonomy over academic content.

In their analysis of different school systems around the world, Mourshed *et al.* (2010) show that school autonomy is more effective in systems that are moving from 'great to excellent'. This highlights that schools (and school systems) need a number of the fundamental drivers of school improvement in place to effectively utilise their autonomy.

4.2.2 Data is often ambiguous

Measuring school autonomy is difficult and fraught with ambiguities.¹¹⁴ Two problems dominate:

1. **'Schools' are not granted autonomy:** It is misleading to say autonomy is granted to a school: autonomy devolves decision-making responsibilities to the leaders of a school. When this is the principal the line of decision-making is clear. But the involvement of other actors, such as a school board or school council, makes it harder to decipher who has governance and decision-making responsibilities, and to measure what impact autonomy is having. For example, does a principal have autonomy if the local school council has a large role in decision-making?

2. **Measurement of autonomy:** School autonomy is often not absolute. Multiple levels of authority often share decisions. For example, a principal may choose a course of action in which his or her options are bounded by a national framework. Or a school principal may have some say over hiring and firing staff but can only make these decisions in concert with a school council, and operate under centralised agreements that restrict – often severely – who and how many staff the school can hire. Under such circumstances, how much autonomy does a school principal actually have?

There is also the question of how much autonomy a school can have in a given area. Budgets provide an important example. Across the OECD, school autonomy data shows that schools make most decisions over their budget.¹¹⁵ What does this mean in practice? Most systems have centralised staffing agreements that set salaries and often the number of teachers to be employed. Salaries regularly comprise 70 to 90 per cent of a school budget. Under these arrangements, how much autonomy can really exist over school budgeting decisions?

Caution must be taken in transferring empirical findings into policy reforms. Empirical evidence has not been able to identify a linear impact from different levels of school autonomy. Does increasing autonomy from 20 to 30 per cent of school decisions have the same impact as moving from 80 to 90 per cent? It's not clear. There is also little understanding of how the interaction of different aspects of autonomy – curriculum and personnel, for example – work at the school level. Perhaps there is a tipping point at which school leaders feel they have the autonomy to assume control of

¹¹⁴ Victorian Competition and Efficiency Commission (2013), p. 27.

¹¹⁵ OECD (2010b).

their school? Conversely, perhaps increasing autonomy above a given level has small or even negative returns if they push against capacity constraints of school leaders.

For these reasons the analysis (presented in Chapter 5) compares only the extreme ends of the school autonomy spectrum: schools with complete autonomy and schools with none.

5. Education strategy and increasing school autonomy

A number of policy makers in Australia and other countries have emphasised school autonomy as a fundamental plank of their education strategy. This may be based on the evidence that some schools excel with increased autonomy, often using innovative policies to lift school performance.¹¹⁶

A more nuanced understanding can be gained from examining how schools operate and respond to increased autonomy. OECD data show that there are few differences between high and low autonomy schools in how teachers are developed, appraised, and receive feedback. These are crucial areas for system improvement and areas that school autonomy and competition policies often target.¹¹⁷

5.1.1 The impact of autonomy on how schools operate

Two key policies to increase school autonomy – and school competition for that matter – are to introduce more private schools (which have greater autonomy almost by definition) and to increase the autonomy of government schools. The impact of

such policies is analysed, first in Australian schools and then in other countries.

Figure 10 (over the page) shows the percentage of lower secondary schools in Australia with low, medium and high levels of staffing autonomy, as reported by each school's principal. Given the difficulties of accurately measuring school autonomy (discussed in Chapter 4) this report compares only schools at the extreme ends of the autonomy spectrum.

This report compares:

- the 19 per cent of teachers who work in low-autonomy government schools. School leaders in these schools cannot make hiring and firing decisions.
- the 29 per cent of teachers who work in high-autonomy private schools. These have complete autonomy to hire and fire.

For autonomy to have a large impact on teacher quality, and academic performance, we would expect large differences in how these two categories of schools operate.

¹¹⁶ Hargreaves (2012).

¹¹⁷ TALIS provides information about teaching practices and beliefs, school leadership, teacher appraisal and feedback, and professional development across lower-secondary schools in Australia and numerous other OECD and non-OECD countries. Ideally, differences in teaching between different types of schools would be assessed through classroom observations. This data does not exist alongside the breadth of data available in TALIS which measures items that the literature suggests would be indicative of high quality teaching and school management.

Figure 10: Percentage of Australian schools with different levels of autonomy¹¹⁸

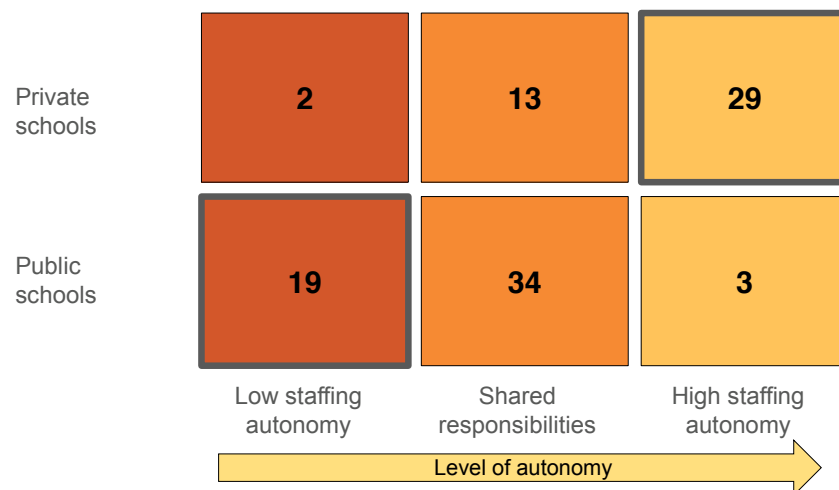


Table 2 compares teachers' reports of teacher appraisal, feedback and development in these two categories of schools. Teacher appraisal, feedback and development are key levers to improve learning and teaching in schools and have been shown to be strongly influenced by the actions of school leaders.¹¹⁹

In general, while highly autonomous private schools perform slightly better than centralised government schools on teacher

development, appraisal and feedback, the differences are not stark.

In both school categories, less than ten per cent of teachers report that they would receive any recognition (monetary or non-monetary) for improving the quality of their teaching or being more innovative in the classroom. Only around ten per cent of teachers in both school categories report that the most effective teachers receive the greatest recognition in their school. In both categories, a majority of teachers report that teacher evaluation is not linked to what actually happens in the classroom (66 per cent in centralised government schools compared to 56 per cent in high-autonomy private schools).

Increasing autonomy or the number of private schools will not change the fact that across all schools, teacher development, appraisal and feedback is poor. A vital means to improve learning and teaching in schools is being missed.¹²⁰

¹¹⁸ OECD (2009b) provides a representative sample of lower-secondary teachers and their school principal. 'Low autonomy' is classified as schools where all decisions in this domain are made by government, local or national. 'Shared responsibilities' is classified as decisions made locally, by teacher, principal or school board, and by government.

¹¹⁹ Hattie (2009); Jensen and Reichl (2011).

¹²⁰ OECD (2009a).

Table 2: Differences in Australian school staffing autonomy (percentage of teachers in each school category)

<i>School practice</i>	<i>Low-autonomy government schools</i>	<i>High-autonomy private schools</i>
Teacher evaluation is 'just an administrative exercise'	68%	56%
Dismiss teachers with sustained poor performance	17%	44%
Staff tolerate sustained poor performance	50%	41%
Alter the pay of a persistently under-performing teacher	56%	67%
Most effective teachers receive greatest rewards	8%	10%
Recognition for improving quality of teaching	6%	10%
Recognition for innovative teaching	6%	10%
Teacher evaluation not linked to classroom teaching	66%	56%
Development plan for teachers	51%	50%
Days of teacher professional development	8	9

Note: Autonomy is measured by the ability to hire and fire staff

Source: Grattan analysis of OECD (2009b)

There are also small differences in the extent to which school staff tolerate sustained under-performance. Yet there is a substantial difference in the frequency with which highly autonomous private schools dismiss poorly performing teachers. Only 17 per cent of teachers in centralised government schools reported that teachers in their school with sustained poor performance would be dismissed. But 44 per cent of teachers in highly-autonomy private schools said this would happen. It is a good thing that underperformance is being addressed but clearly it is being addressed without effective performance management systems.

These findings should not be overstated. If a lack of autonomy was the main impediment to dismissing poorly performing staff then more than 44 per cent of teachers would report that it happens in their highly autonomous private school. Other constraints clearly exist.

Box 9: Independent public schools in WA

Since 2010, 255 schools in Western Australia have become Independent Public Schools (IPS). They receive greater autonomy over staffing, human and financial resources and various administrative and management responsibilities.¹²¹

The program follows an opt-in autonomy model whereby schools choose to apply to the program. Schools need to demonstrate they have the capacity to effectively use greater autonomy, and that this will be of benefit to their local area. The community, including staff, need to support the school's effort to become an IPS. Only once they have demonstrated their capacity can schools actually join the program.

There is substantial capacity-building for schools selected for IPS status. This includes identification of school improvement programs that must be detailed in a three-year business plan. In addition, the Government provides training for school principals, staff and board members as they move to IPS status.

As more schools seek IPS status the challenge for policy makers will be not only building capacity in all of these schools, but in maintaining high standards to achieve IPS status.

The program is relatively new. The recent evaluation found that “in general, the initiative has had a neutral or positive effect on the classroom” and that the foundations were in place for improvement in student learning.¹²²

School principals have found the ability to select staff the most important aspect of the program, allowing them to select teachers that fit the schools' students and ethos. The evaluation emphasises the importance of change management with the introduction of autonomy.¹²³

For some, the increased responsibility is a daunting increase in responsibility, which can be eased with appropriate training, support and management.

¹²¹ Department of Education (WA) (2012b).

¹²² Melbourne Graduate School of Education (2013), p. 34.

¹²³ Ibid., p. 46.

5.1.2 The impact of autonomy on how schools operate: international findings

To see whether the pattern of difference between low-autonomy government schools and high-autonomy private schools extended beyond Australia, a broader sample of countries was analysed. Given the relatively small number of private schools in some countries, to make the analysis meaningful we only examined countries with a high proportion of private schools (in the 2008 TALIS sample, these countries were Australia; Austria; Belgium; Denmark; Ireland; Korea; Portugal and Spain).¹²⁴

Figure 11 presents the concentration of low-autonomy government schools in these countries, and shows that:

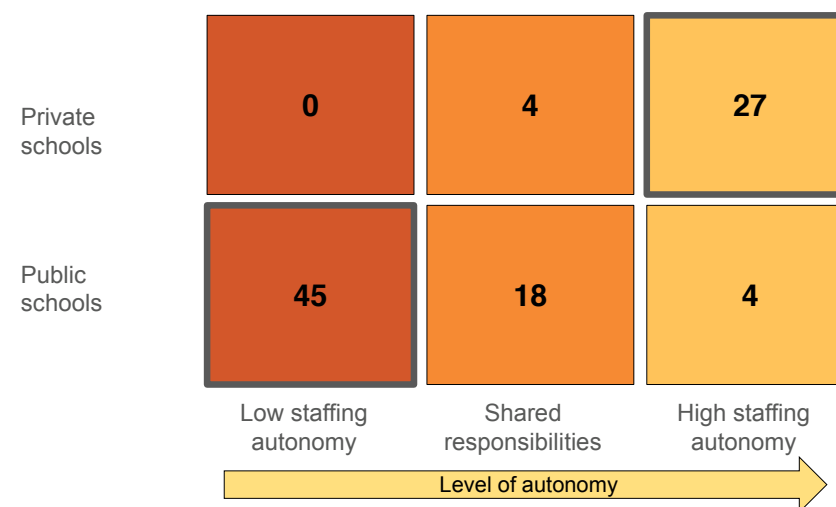
1. 45 per cent of teachers work in low-autonomy government schools.
2. 27 per cent of teachers work in high-autonomy private schools.

As was the case with the Australian analysis, there were very few major differences in the staff management, development and appraisal practices of low-autonomy government schools compared to their high-autonomy private counterparts (as summarised in Table 3).

Both generally fail to recognise teacher performance, conduct effective teacher appraisal, or make important links to teacher development. Nine per cent of teachers said effective teachers

were rewarded in their centralised government schools compared to 10 per cent of teachers in highly autonomous private schools. Similar numbers of teachers reported their school recognised quality and innovative teaching.

Figure 11: Percentage of schools in selected TALIS countries with different levels of autonomy¹²⁵



¹²⁵ Countries analysed: Australia, Austria, Belgium, Denmark, Ireland, Korea, Portugal and Spain. Ibid. provides a representative sample of lower-secondary teachers and their school principal. 'Low autonomy' is classified as schools where all decisions in this domain are made by government (local or national). 'Shared responsibilities' is classified as decisions made locally, by teacher, principal or school board, and by government.

¹²⁴ OECD (2009b).

Once again, the only major difference between the two categories related to dismissing teachers with sustained poor performance. This rarely happens in centralised government schools (only ten per cent of teachers report it occurring in their schools). Over one-third of teachers said it happened in their highly-autonomous private schools. This is an important difference and highlights the role of policy in this area. But for most teachers across any category of school, it is troubling that addressing poor performance is rare and not linked to effective performance management. For too many teachers, teacher evaluation is not linked to what happens in the classroom. Teachers are not being evaluated on the quality of teaching and learning in either centralised government schools or highly autonomous private schools.

Table 3: Differences in staffing autonomy in selected TALIS countries* (percentage of teachers in each school category)

<i>School practice</i>	<i>Low-autonomy government schools</i>	<i>High-autonomy private schools</i>
Teacher evaluation is 'just an administrative exercise'	54%	39%
Dismiss teachers with sustained poor performance	10%	36%
Staff tolerate sustained poor performance	39%	35%
Alter the pay of a persistently under-performing teacher	10%	15%
Most effective teachers receive greatest rewards	9%	10%
Recognition for improving quality of teaching	11%	12%
Recognition for innovative teaching	12%	12%
Teacher evaluation not linked to classroom teaching	60%	50%
Development plan for teachers	44%	57%
Days of teacher professional development	24	17

*Note: * Australia, Austria, Belgium, Denmark, Ireland, Korea, Portugal and Spain. Note also that autonomy is measured by the ability to hire and fire staff*
Source: OECD (2009b)

6. Conclusion

The policy implications of this report are generally divided between school competition and school autonomy. However, the need for effective education strategy transcends both policy areas.

6.1 School competition to improve performance

By increasing competition, government policies have increased the effectiveness of many sectors of the economy. But school education is not one of them. The impact of interventions to increase school competition has been marginal, at best. Even in Australian education markets with relatively high numbers of private schools, with government funding to private schools, and with government schools that have relatively high autonomy, most schools face no or limited competition based on their performance. The structure of school education and the failures in the market are too great. This doesn't mean that school competition has a negative impact or does not have other benefits. Nor does it mean that some schools don't face competitive pressures or that some students will choose schools because they are high performing. It just means it is not a viable way of increasing the performance of school systems.

Government interventions to improve the market won't solve the problem. The *My School* website was a significant intervention in Australian education, increasing transparency and the focus on key areas of literacy and numeracy. This great increase in information about schools has not led to a level of competition that increases performance. Generally, families don't use the

information to choose higher performing schools. When families don't choose schools based on performance, schools do not have market-based incentives to improve their performance. Not only do high-performing schools not grow sufficiently, people still choose to attend low-performing schools.

Part of the reason is that governments cannot pursue strategies that actively seek to push families away from low-performing schools and towards high-performing schools. Basic marketing tells you that changing human behaviour and purchasing decisions requires much more than information. It requires selling one alternative over another.¹²⁶ Governments cannot do this. For a variety of political and governance reasons, governments cannot encourage families to leave a school because it is low-performing.

Nor will vouchers or subsidies to private schools make much difference. They won't overcome the market failures inherent in school education. Neither will significant increases in the capacity of government schools. Reducing capacity constraints will substantially increase expenditure, but have a limited impact on competition that increases performance across systems.

Policy makers can pursue programs to expand the capacity of specific high-performing schools but this will only improve some

¹²⁶ Haan and Moraga-Gonzalez (2011) find that persuasive advertising is essential to attract consumer interest and sales in a competitive market. Bruce, et al. (2012) study consumers' responses to advertising, finding that advertising triggers the cognitive processes that produce sales and build brands.

local markets. Encouraging greater collaboration between schools with varying levels of performance can also be important but this is more a school improvement program than a reform to increase school competition.¹²⁷

6.2 Poor strategy and implementation of school autonomy means school performance is not improving

There are few differences in key school improvement programs in highly autonomous schools compared to centralised schools. They too often share the same bad practices. This doesn't mean that school autonomy should not be pursued but it does show that it is often poorly implemented, and it has little impact in vital areas that should be the focus of reform.

If too much emphasis is placed on increasing school autonomy, strategy becomes unbalanced. This means too little focus is put on policies that have consistently been found to improve school systems.

High-performing systems have varying levels of school autonomy, but they all have a clearly articulated focus on effective learning and teaching, strong capacity building in schools, and implementation plans that connect high-level strategy to what happens in the classroom.¹²⁸ This may sound like extensive government involvement, but it isn't. Detailed implementation plans do not mean that government intervention will crush school autonomy.¹²⁹ Both Hong Kong and Ontario, for example, had

improvement strategies that turned their systems into two of the best in the world.¹³⁰ Both focused intensely on implementation. Both created positions in schools to lead improvements in learning and teaching that connected strategy to the classroom.

But each system gave schools autonomy in different ways. In Ontario, schools were told they had to have someone to lead improvements in learning and teaching but the schools could choose the person and what position they would hold.¹³¹ The Hong Kong government, by contrast, was more direct in its intervention, creating specific positions in schools to lead reform. In other areas, Hong Kong grants large degrees of school autonomy but in this area the government was more direct and explicit in its intervention.¹³²

Policy makers have often struggled with ineffective practices that place staff hiring and firing decisions in the hands of a central body. Increasing school autonomy has often been a response.¹³³ An effective school strategy recognises that empowering school leaders is about much more than autonomy. It lifts capacity in schools to effectively appraise, develop and provide meaningful feedback to teachers. Too often, schools are being granted autonomy with insufficient capacity building and in many cases an incomplete reform strategy. This means that autonomous schools generally have the same poor practices in these crucial areas as those dictated by a centralised body.

¹²⁷ Jensen and Farmer (2013).

¹²⁸ Jensen, *et al.* (2012), Fullan (2011).

¹²⁹ Mourshed, *et al.* (2010); Caldwell and Spinks (2013).

¹³⁰ Mourshed, *et al.* (2010).

¹³¹ Levin (2008).

¹³² Jensen, *et al.* (2012).

¹³³ OECD (2010c), p. 41.

Similar examples are found in how schools spend their money. Evidence from England has shown that substantial increases in school autonomy and funding have often resulted in inefficient expenditure.¹³⁴ Principals in the ACT with increased budget autonomy spent it first on computers and second on new classroom furnishings.¹³⁵ Again, neither of these is known to particularly improve teaching and learning. But both are visible and help a school trying to attract parents.¹³⁶ An effective strategy, on the other hand, provides both direction and autonomy in how schools effectively spend money to increase learning.

Centralised accountability and autonomy

Numerous analyses of reform in high-performing education systems show that increasing autonomy is most effective if it is accompanied by increased accountability. Performance needs to be monitored and evaluated so that autonomous schools are held accountable for it.¹³⁷

¹³⁴ Cunningham and Lewis (2012).

¹³⁵ Hugh Watson Consulting (2004).

¹³⁶ Research shows that parents often value visible aspects of education, as discussed in Section 3.1.

¹³⁷ Mourshed, *et al.* (2010); OECD (2010e). It is important to differentiate varying types of accountability. Normally, school accountability is discussed in terms of accountability to governments or another centralised institution (for example, see OECD (2011)). But school competition and autonomy should also increase market accountability (i.e. parents using their power to choose schools to shape school practices). There is little evidence of the magnitude of market accountability, although the low levels of school competition detailed in this report would indicate that market accountability is, for most schools, less of an influence than accountability mechanisms to government. We can assume that all schools are accountable to parents. Intuitively, it may be that schools facing

Some systems succeed in increasing both school accountability and school autonomy, but many don't. Increasing accountability can (but not always will) reduce the benefits of school autonomy as predicted in some quantitative studies. School accountability and autonomy can be opposing forces. For example, holding schools accountable through national student testing reduces their autonomy over curriculum, assessment and, to some degree, pedagogy. Holding schools accountable for how they implement a national curriculum reduces their autonomy over what they teach.

For these reasons, there has been decrease in some aspects of school autonomy in Australia and other countries in recent years. The policy rhetoric has focused on increasing autonomy, and accountability has been increased alongside these moves. In Australia, national tests have been introduced and a national curriculum is being implemented. The net impact has been a reduction in school assessment autonomy: in 2000, 99 per cent of students were in schools with local assessment autonomy, compared to 65 per cent in schools with local control in 2009.¹³⁸

The predicted impact of increasing school autonomy can be substantially reduced if an accompanying increase in school

competitive pressures from other schools would face greater accountability from parents, but there is no data available on this issue.

¹³⁸ A similar finding exists in the United States. In 2000, 93 per cent of students were in schools with local assessment autonomy. By 2009, this had fallen to 46 per cent. This occurred during a substantial increase in school accountability and a greater emphasis on national testing led by *No Child Left Behind*. Again, the estimated gains that would be achieved by increasing school autonomy are virtually all wiped out from consequent increases in school accountability. Source: OECD (2004), p. 22 and p. 74; OECD (2010c), Figure IV.3.3b, p71.

accountability also reduces autonomy. This is particularly pertinent given that the OECD finds that the strongest link between school autonomy and performance is for autonomy over curriculum and assessment decisions. Yet, it is this aspect of school autonomy that can be decreased when national student assessments and tighter curriculum standards are introduced (often in conjunction with increased school autonomy).

This doesn't mean the strategy of increasing school autonomy and school accountability at the same time is wrong. But the impact of school autonomy predicted by some quantitative studies may not eventuate if increases in school accountability decrease school autonomy.

A school should not be given autonomy without monitoring and evaluating its performance. So how do systems overcome the problem of implementing an accountability regime while still increasing important aspects of autonomy?

First, policy makers need to drop the notion that autonomy is a goal in itself. Improving learning should always be the objective. Second, the mix of school autonomy and accountability needs to be designed within a strategy to improve learning and teaching behaviours. Not all accountability measures will substantially impact on important aspects of school autonomy. School accountability that empowers teachers and school principals can increase school autonomy over the longer term. Some forms of school inspections can focus on improving specific aspects of teaching.¹³⁹

¹³⁹ Jensen, *et al.* (2012).

Education strategy in Hong Kong maps how each policy and program, including autonomy and accountability, affect learning and teaching in the classroom. Push reforms provide teachers and school leaders with new content and support for improvement. Pull reforms set new standards and outcomes that teachers, school leaders and students must reach.¹⁴⁰

Third, it is necessary to determine which aspects of autonomy are most important to increase. They should be aligned to the overall improvement strategy and reflect current levels of autonomy. They may even decrease as school accountability increases.

Autonomy and empowerment are often used interchangeably and this is a mistake. Autonomy allows school leaders to make decisions and take specific actions. It is only one possible element of empowering school leaders. Empowering school leaders requires a clear strategy that provides direction on important elements of school reform. Perhaps most importantly, empowering school leaders requires developing their leadership skills so they can effectively exercise the autonomy they are given.

The evidence is clear that in Australia and other countries with large shares of highly-autonomous private schools, school leaders have been given significant autonomy. But they have not been empowered to make necessary reforms in teacher appraisal, feedback and development that will increase student learning. Too much of an emphasis on school autonomy means systems have failed to empower school leaders.

¹⁴⁰ Ibid.

Appendix A: Methodology, data, and assumptions

This appendix details the data, methodology and assumptions used to quantify the extent to which schools face competitive pressures.

In addition to detailing the methods used in this report, this appendix explores how robust the findings are to changes in a number of assumptions. It also investigates how the analysis is affected by changes in policy-relevant variables, for example the capacity of public schools, or the fees charged by private schools. In general, although the estimates of competition are sensitive to the assumptions, the main results are robust. Specifically, regardless of assumptions:

- A significant proportion of schools face little or no competition. In fact, in most scenarios presented below, the proportion of schools not facing competitive pressures is substantially higher than the numbers presented in the report.
- Government policies can only have a limited impact in spurring competition.

In the interest of concision, the results are not presented under an exhaustive combination of possible assumptions. However, should policy-makers or researchers be interested in the outcome of the modelling under scenarios not presented here, the authors will endeavour to supply the information.

A.1 Overview of methodology

The analysis was structured around two questions: “how much competition currently exists?” and “is there scope to raise this level substantially through public policy?”

Grappling with these questions first required a definition of what it means for two schools to be in meaningful competition. The definition on four dimensions:

- distance (between two potentially-competing schools)
- relative school performance (in terms of NAPLAN scores)
- relative price (in terms of school fees)
- capacity status

The definition of ‘competitive pressure’ was the presence of a competitor that was: **local; at least as good; affordable and not at capacity**. With this definition of competition, the analysis comprised six main steps:

1. assemble and geocode a list of schools (within a jurisdiction of interest)
2. define a local market for each of these schools, and enumerate potential competitors
3. define a school-commuting function to answer the question, ‘how likely is it that a student will travel to a competitor school?’

4. identify which schools are at capacity
5. identify schools which are 'at least as high-performing'
6. define an affordability function to answer the question 'how likely is it that a student will be able to afford a competitor school?'

The remainder of this section outlines the data, methods and assumptions used in each of these six steps.

Box 10: Terms used in defining competition

'Local' was defined according to current commuting patterns. The baseline range for a school's 'local area' was 21.7km.¹⁴¹

'School performance' was defined as the average NAPLAN national assessments results from 2008-11, for Year 9, across all domains.¹⁴² In the baseline definition, a nearby school was coded as a competitor if its average was equal to, or greater than, the score of the school being analysed.

'Affordable' was defined in terms of households' current willingness to pay for private schools (discussed at length below).

'At capacity' was defined for government schools by a combination of current utilisation (if at least 95 per cent) or the presence of an enrolment management plan (usually implemented when a school is close to reaching capacity).

¹⁴¹ The data sets and analysis sitting behind these decisions are discussed in the remainder of section 1.

¹⁴² This analysis was completed before the release of full NAPLAN results for 2012, and therefore these results do not form part of the analysis.

A.1.1 Assemble and geocode a list of schools

The analysis focused on secondary schools – specifically, entry into secondary school. Secondary schools were chosen because the transition from primary to secondary school is the point at which the most students change schools, making competition more likely.

The focus on secondary schools meant primary schools were excluded from the analysis, although 'combined' schools (i.e. schools offering both primary and secondary education) were not filtered out.

Geographically, the analysis centred on South East Queensland (SEQ). There were two reasons for this:

- It was beyond the Institute's resources to assemble the requisite data for all secondary schools in Australia (this was especially true of the primary research into private school capacity).
- As discussed below, data from a variety of sources were needed to undertake the analysis. In two instances, the highest quality accessible data came from Queensland (i.e. data on school commuting, and information on public school capacity).

A list of Queensland's secondary and combined schools was sourced from the *My School* website (sample size=498).¹⁴³

¹⁴³ Australian Curriculum Assessment and Reporting Authority (2013a).

Schools were excluded if they:

- did not report NAPLAN information in any of the years 2008 to 2011; or
- were missing total enrolment information in 2009 or 2011.

This reduced the sample to 451 schools.

Last, schools that were outside SEQ were put to one side, leaving a **final sample of 233 schools**.¹⁴⁴

The geographical boundaries of ‘SEQ’ were defined according to the areas covered in the ‘South East Queensland Travel Survey’ (SEQTS) (see Figure 12).¹⁴⁵ This included the Sunshine Coast, the Greater Brisbane area and the Gold Coast.

The schools were geocoded using iTouchMap.com,¹⁴⁶ and the resulting co-ordinates were checked with GPS Visualiser.¹⁴⁷ Where co-ordinates differed, Google *Street View* was used to confirm the location of the school.¹⁴⁸

The characteristics of the schools in the SEQ sample are compared to average Australian ‘metropolitan’ schools in Table 4.¹⁴⁹ The SEQ schools are broadly representative of Australian metropolitan secondary schools, with the caveat that SEQ schools tend to be bigger than the Australian average.

Table 4: Comparison of secondary schools in SEQ, and Australia

	SEQ	Australia (metro*)
Number of schools	233	1,366
Size (mean 2011 enrolment)	999	893
School ICSEA (mean)	1,028	1,041
NAPLAN performance (mean Year 9 score across all domains, 2008-11)	576.4	583.5
% of Private Schools	45%	52%
% of ‘Combined’ schools [†]	46%	41%

Notes: *Metropolitan is a designation given on the My School website; [†] Combined refers to schools that offer both primary and secondary grades.

Sources: Grattan Institute research; size and NAPLAN information came from My School; fees information came from a search of school websites.

¹⁴⁴ Note that we used this sample of non-SEQ Queensland schools to perform some exploratory estimates.

¹⁴⁵ Queensland Department of Transport and Main Roads (2009).

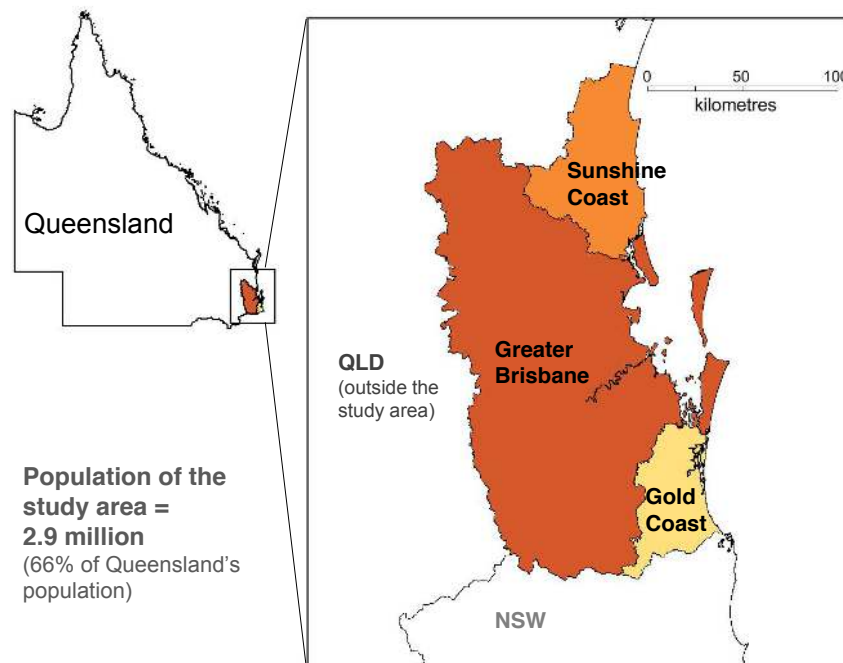
¹⁴⁶ iTouchMap (2013).

¹⁴⁷ GPS Visualizer (2013).

¹⁴⁸ Movable Type Scripts (2013).

¹⁴⁹ Based on the *My School* website’s definition of ‘metropolitan’.

Figure 12: Geographic area of the analysis

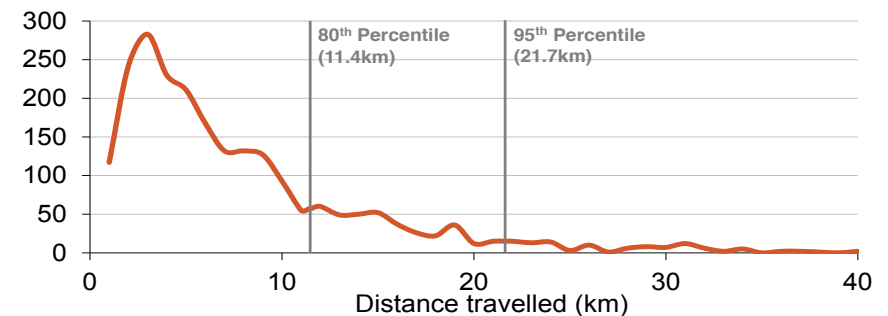


Source: Queensland Department of Transport and Main Roads (2009); ABS Census 2011

A.1.2 Define a local area for each school, and enumerate potential competitors

Relative to many industries, the market for schools is local.¹⁵⁰ The analysis incorporates this aspect of school competition by using data from the 2009 SEQTS. The survey contains very detailed information for almost 80,000 trips by residents in SEQ (including the SA1¹⁵¹ of origin and destination of each trip). This dataset gave us a quite a clear picture of current school commuting patterns. The analysis made use of the 'Trips' file from SEQTS data. These data were filtered to include only trips to secondary school (DESTPLACE2 = 504), resulting in a total of 2,275 commutes. The measure of distance was network distance travelled (i.e. NETWORK_DIST). The density function for school commutes in SEQ in 2009 is presented in Figure 13.

Figure 13: Density plot of SEQ school commutes (network distance)



Source: Queensland Department of Transport and Main Roads (2009)

¹⁵⁰ See Woods, et al. (1998) and Bell (2009).

¹⁵¹ Census statistical area – second smallest geographic boundary.

In the baseline analysis, we made the conservative assumption that a school's local area would be defined by the 95th percentile commuting distance – i.e. by a boundary that extended 21.7km around each school.

To find potential competitors, the software R was used to estimate the network distances between all possible school pairs. This process involved 3 steps:

- a) estimating the straight-line distance between each school (based on their co-ordinates, and using the 'equirectangular approximation')¹⁵²
- b) estimating a simple linear regression model, with network distance as the dependent variable and straight-line distance as the predictor. This model was estimated using the school commuting data (sample size=2,275)¹⁵³
- c) using the regression model to predict the network distances between schools based on the straight-line distances calculated in part (a)

Having defined the local boundary for each school (i.e. a network distance of 21.7km) and estimated the network distance between

¹⁵² Movable Type Scripts (2013).

¹⁵³ The SEQTS did not have a straight-line distance variable, so one was defined. This was achieved in three parts: first, we isolated the ORIG_SA1_2011 and DEST_SA1_11 variables in the SEQTS data to define the co-ordinates of the trip origin and the trip destination; second, we defined a set of co-ordinates for the origin and destination of each trip by assuming that the location of each trip was defined by the centre-point of each SA1, as defined by the ABS (Australian Bureau of Statistics (2011a). Finally, we calculated the straight-line distance using the equirectangular approximation already referenced.

each pair of schools, a list of potential competitors was generated for each school simply by finding schools that were within the boundary.

A.1.3 Define a school-commuting function

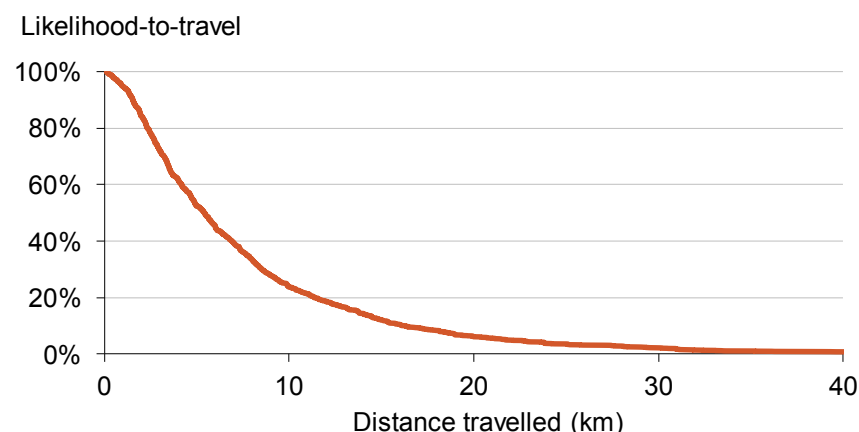
The purpose of this step was to answer the question 'how likely is it that a student will travel to a competitor school?' Within a school's local boundary, not all potential competitors will be equally likely to compete for students. All else equal, a competitor that is next door will exert more competitive pressure than a school that is 21.7 km away.

To incorporate this idea into the analysis, a school commuting function was defined using the distribution presented in Figure 13 (on the previous page). Based on this distribution of revealed school commuting distances, the travel-likelihood function as plotted is presented in Figure 14.

Note that Figure 14 reflects current practice. For example, the estimate is that 24 per cent of households would be willing to commute ten kilometres, based on the fact that currently 24 per cent of people commute at least this far.

It's also worth noting that these figures are independent of school quality, access to different transport modes (e.g. public transport, car) and a variety of other factors which may determine willingness to travel. Incorporating these elements are areas for future research.

Figure 14: Likelihood that current school commuters travel at least a particular distance



Note: This function is essentially (1 minus the CDF of Figure 13)
 Source: Queensland Department of Transport and Main Roads (2009)

A.1.4 Identify which schools are 'at capacity'

For public schools, capacity information was made available by the Queensland Department of Education.¹⁵⁴

Implicit to the idea of 'competition' is the notion that students are able to enrol in the school of their choice. Therefore, public schools were defined as facing capacity constraints if either:

- they had an enrolment management plan (as at October 31 2012); OR

¹⁵⁴ To download the data, see Department of Education Training and Employment (Qld) (2012).

- their reported enrolment in the February 2012 census was \geq 95 per cent of their assessed capacity.

For private schools, the authors undertook primary research to determine capacity constraints. Two methods were used:

- a short phone interview
- a very brief email survey sent to enrolment personnel.¹⁵⁵ The questions asked are presented in Figure 15.

Figure 15: Questions used to determine 'capacity' for private schools

Questions

1. Do you have any spare places for year 8 (or the first year of secondary school) in 2014?
2. Did you have to turn down any applications for enrolment into year 8 for this year?

Based on responses to these questions, private schools were coded as 'at capacity' if either: a) they were already full for next year (in terms of enrolment into the first year of secondary school), or b) if they ended up turning away students last year (for entry into secondary school this year).¹⁵⁶

58 per cent of the 128 private schools in the sample responded to the information request. Of these, 61 per cent were coded as 'at capacity'.

¹⁵⁵ The email was sent to schools that we were either unable to reach on the phone, or who were more comfortable replying in writing.

¹⁵⁶ Many of the schools we spoke to hadn't yet finalised their enrolment processes for 2014, which is why the second question was included.

As illustrated in Table 5, the schools that did not respond to the research request were very similar – in terms of size, NAPLAN performance and fees – to those that did.

Table 5: Comparison of schools that did and did not respond to the research request.

	<i>Respondents</i>	<i>Non-respondents</i>
Number of schools	74	54
Size (2011 enrolment)	921	917
NAPLAN performance (average Year 9 score across all domains, 2008-11)	589.3	593.5
Fees (Year 8, 2013)	\$7,074	\$7,060

Sources: Grattan Institute research; size and NAPLAN information came from My School; fees information came from a search of school websites.

Imputing capacity for non-respondents.

The 54 private schools that did not respond to the survey, were imputed ‘at capacity’ status, based on a simple probit model, where capacity was predicted by the variables listed below (the names used in the regression output appear in *italics*):

- Year 9 average NAPLAN performance (across all domains from 2008-11; this variable was divided by ten to make a 1 unit shift better reflect a meaningful difference between schools), *yr9.raw*

- Size (based on total enrolment from 2011; this was divided by 100), *enrolment*
- Change in enrolment (from 2009-11; divided by 100), *enrol.change*
- Fees (Year 8 fees in 2013, measured in thousands of dollars), *fees*
- The number of competitors in the local area, *competitors*
- The Year 9 NAPLAN score of a school compared to the mean score of its local competitors (also divided by ten, to match the *yr9.raw* score), *yr9.cf.comp*
- A dummy of whether a school was ‘secondary’ or ‘combined’ [i.e. with a primary school], *secondary*
- A dummy indicating whether the school was a private school, *private*

The output of the model is presented in Table 6.

When applied to the sample of SEQ private schools for which there was capacity information, the model correctly predicted the known capacity status in 71 per cent of cases.

Table 6: Output of probit model used for imputation¹⁵⁷

	<i>Coefficient</i>	<i>s.e.</i>
Intercept	-13.47	3.82
yr9.raw	0.18	0.07
enrolment	0.19	0.03
enrol.change	0.36	0.12
fees	-0.06	0.04
competitors	0.00	0.00
yr9.cf.comp	0.00	0.05
secondary	0.78	0.27
private	1.12	0.32

A.1.5 Identify schools which are ‘at least as high-performing’

Given the focus on secondary schools, school performance was defined as the average NAPLAN score for Year 9 (across all domains, for 2008-2011). That is, for schools that had reported Year 9 NAPLAN scores in each round of testing, the measure of performance was taken to be the average of the 20 scores (four years, five domains). This data was sourced from the *My School* website.¹⁵⁸

¹⁵⁷ A logit model was also estimated. In terms of predicting the capacity status of schools for which was lacking this information, the models produced exactly the same result.

¹⁵⁸ Australian Curriculum Assessment and Reporting Authority (2013a).

It is difficult to know how parents evaluate schools using performance data. For instance, some people may be interested in raw scores, while others may prioritise high performance in ‘similar school’ measures (i.e. measures that compare results to other schools with similar average socio-economic profiles).

Based largely on evidence from the UK, it is assumed that parents and students would focus more on absolute achievement (as opposed to similar school scores).¹⁵⁹

A school was defined as ‘at least as high-performing’ as another school if its average Year 9 raw achievement score was greater than or equal to the other school.

A.1.6 Define an affordability function

There were two analytical components to answering the question “how likely is it that a student will be able to afford a competitor school?” The first was to build an income profile for each SA1 in SEQ. The second was to estimate households willingness-to-pay for private schools, based on their income.

Building an income profile by SA1

Income data was collected at the SA1 level from ABS 2011 Census via TableBuilder.

The data were filtered by Family Composition (i.e. FMFC) at the 2-digit level.¹⁶⁰ Families were excluded unless they were either a

¹⁵⁹ See Coldron, *et al.* (2008). Also of note: using raw achievement as opposed to a measure of value add appears to be a good strategy for parents interested in maximising their child’s test scores, as illustrated in Allen and Burgess (2011).

‘couple family with children under 15’ or ‘one parent family with children under 15’.

The income measure used was Total Family Income (Weekly) (i.e. FINF).¹⁶¹ All 17 ABS FINF income bands were included. ‘Negative income’ was coded as having a value of 0 (in total, this band represented 0.6 per cent of the non-excluded families).

Assessing the willingness to pay for private schools, by income group

Wave Ten of the Household, Income and Labour Dynamics in Australia (HILDA) was used to estimate the relationship between household income and the level of spending on education.

The income variable used was **jhifefp** (household financial year gross income).¹⁶²

No measure of ‘private school fees’ was available in the data. As an indicator, we used **jhxyeduc** (household annual expenditure - education fees).¹⁶³ Four steps were taken to ensure that this variable best captured private school expenditure for secondary school students:

- The combined HILDA sample (initial sample size of 17,855) was trimmed to exclude cases where household annual expenditure on education fees was < 0). This left 15,037 individuals in the sample.
- Data was confined to households with individuals between the ages of 12 and 17 (inclusive), which left 649 individuals remaining in the sample.
- The sample was filtered to exclude all individuals that attended government schools. This left 220 cases.
- Finally, the data were cleaned so that families with multiple children attending private school were only counted once. (The number of families with multiple children between 12-17 attending private school was 12, bringing the final total to 208).¹⁶⁴

This sample was then stratified into five income buckets. This was done to reflect the fact that within each income group, there will be a distribution of the willingness to pay for private school fees.

For every observed level of private school fees, the authors calculated the proportion of people in each income bucket who currently paid at least that figure in fees (based on the **jhxyeduc** variable). Figure 16 presents the plots for all five groups. It’s worth noting that in each group there are households who pay \$0 fees

¹⁶⁰ Australian Bureau of Statistics (2011b).

¹⁶¹ Australian Bureau of Statistics (2011c)

¹⁶² Melbourne Institute (2011). This variable was partly chosen based on a comparison of its density plot compared to the ABS measure FINF: i.e. this appeared to be the best analogue of the ABS variable.

¹⁶³ Ibid.

¹⁶⁴ This means that in 12 cases, our affordability figures represent the cost of >1 student in a household. Given our fee data applies to a single student, the effect of this is to increase the estimated level of competition relative (by lowering the affordability barriers). That said, given the relatively small number of cases, this effect has no meaningful impact on our results.

(or very low fees). It is speculated that these students are on scholarships.

Combining income data in the sample area, and willingness to pay estimates

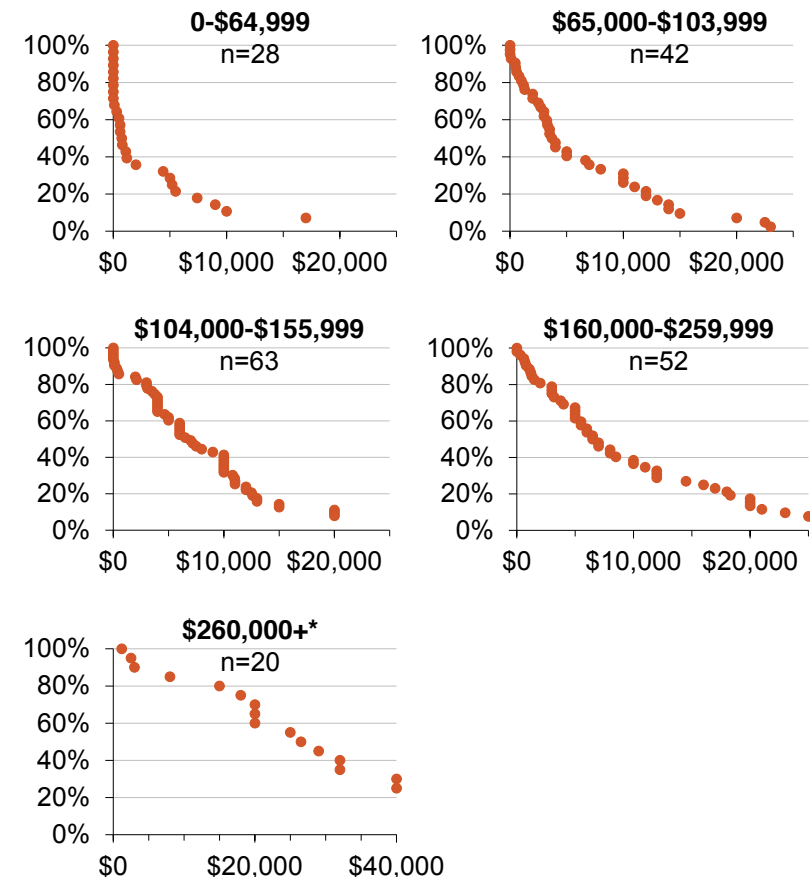
The income data, which originally had 17 bands, were rolled into the five income buckets defined in the 'willingness to pay' charts presented in Figure 16.

The proportion of people in each SA1 who would be able to pay was defined by the proportion of people in each income band multiplied by the proportion of people in that band who currently pay at least that much on private schooling.

Table 7 presents the example inputs for SA1 311303, and a school with Year 8 fees of \$10,000. To estimate the likelihood that a family in this SA1 will be able to afford these fees, the sum-product of the two columns was calculated (which in this case yielded 29 per cent).

It's important to note that this approach leads to a very generous estimate of 'affordability'. Recall that the proportions defined by the charts in Figure 16 are *based on the population of households who currently send their children to private schools*. This is clearly not a representative sample of Australian households. This approach is adopted to be as generous as possible when assessing the current levels of competition between schools in Queensland.

Figure 16: Plot of actual fees paid (by household income group)



*Note: For this group, the x-axis is changed, as the sample included a number of families in the income group '\$260,000+' that paid more than \$25,000 in education fees in 2010

Source: Melbourne Institute (2011)

Fee data

Data on the fees being charged for Year 8 in 2013 came from three sources. In order of preference, these were:

- school websites, quoting 2013 rates (88 per cent of schools). [Note that tuition charges were only recorded (i.e. not including extra charges such as capital levies, application fees and so on). This, again, is a conservative approach in terms of access to private schools. In some cases, compulsory non-tuition charges make up nearly half of the total fees.]
- school websites, quoting 2012 or 2011 rates and converted into 2013 terms using the rough approach of applying the average annual increase in the education component of capital-city CPI increases from 2009-10 to 2011-12 (4 per cent of schools)¹⁶⁵
- the *My School* website, based on 'fees/student' in 2011, put in 2013 terms (8 per cent of schools)¹⁶⁶

Table 7: Example inputs for estimating the likelihood that a household in SA1 3100135 could afford fees of \$10,000 p.a.

<i>Income bucket</i>	<i>Likelihood of people in income band to afford \$10,000p.a. in school fees (defined by distributions in Figure 16)</i>	<i>Proportion of SA1 3100135 in income bucket</i>
0 - \$64,999	11%	31%
\$65,000 - \$103,999	31%	23%
\$104,000 - \$155,999	41%	38%
\$160,000-\$259,999	38%	8%
\$260,000+	80%	0%

Note: the slightly lower percentage of income group \$160,000-\$259,999 (relative to the \$65,000-\$103,999 group reflects the fact that in the HILDA wave 10, the observed level of private school costs for these groups was extremely similar)

¹⁶⁵ Australian Bureau of Statistics (2012).

¹⁶⁶ Using the inflator available from *ibid.*

A.2 Worked example

To illustrate the analytical method used, and how this translated into the final outputs, this section presents a worked example of the steps described above. The example uses a school chosen at random (School X) and used baseline assumptions (see Box 10). The data used are summarised in Table 8. The main outputs are:

1. that School X is **not** a school that is insulated from competition (i.e. it has local competitors that are least as good, and not at capacity), and
2. that School X's nearest competitor is **sufficiently close and affordable** that a 'significant' proportion of its catchment may consider this option. The rest of this section describes how the conclusions were reached for School X.

Table 8: Overview of inputs used in School X example¹⁶⁷

<i>Name</i>	<i>Yr9 Naplan</i>	<i>Sector</i>	<i>Dist from School X (km)</i>	<i>Prob of travel</i>	<i>Capacity (raw data)</i>	<i>Capacity (including imputation)</i>	<i>'At least as good'?</i>	<i>Spare capacity & at least as good?</i>	<i>Yr 8 Fees</i>	<i>Prob School X's students can pay fees</i>
School X	578	Private	-	-	-	-	-	-	\$1,948	100%
Competitor 1	623	Private	3	78%	Capacity	Capacity	Yes	No	\$9,148	46%
Competitor 2	570	Gov	3	69%	Capacity	Capacity	No	No	\$0	100%
Competitor 3	619	Private	5	52%	Capacity	Capacity	Yes	No	\$9,036	46%
Competitor 4	571	Gov	6	48%	Spare	Spare	No	No	\$0	100%
Competitor 5	578	Gov	7	37%	Capacity	Capacity	Yes	No	\$0	100%
Competitor 6	646	Private	8	35%	Capacity	Capacity	Yes	No	\$13,512	27%

¹⁶⁷ An equivalent table was generated for each school in the sample.

Competitor 7	592	Gov	8	30%	Capacity	Capacity	Yes	No	\$0	100%
Competitor 8	596	Private	9	26%	No data	Spare	Yes	Yes	\$8,190	46%
Competitor 9	552	Gov	9	26%	Spare	Spare	No	No	\$0	100%
Competitor 10	595	Private	10	24%	No data	Capacity	Yes	No	\$7,180	55%
Competitor 11	565	Gov	10	23%	Capacity	Capacity	No	No	\$0	100%
Competitor 12	543	Gov	10	23%	Spare	Spare	No	No	\$0	100%
Competitor 13	587	Private	11	22%	Capacity	Capacity	Yes	No	\$3,573	83%
Competitor 14	589	Private	11	21%	Spare	Spare	Yes	Yes	\$5,052	67%
Competitor 15	595	Private	11	21%	Capacity	Capacity	Yes	No	\$18,232	19%
Competitor 16	582	Private	12	18%	Capacity	Capacity	Yes	No	\$2,244	94%
Competitor 17	622	Private	12	17%	No data	Capacity	Yes	No	\$15,965	22%
Competitor 18	558	Gov	13	16%	Spare	Spare	No	No	\$0	100%
Competitor 19	592	Private	14	13%	Spare	Spare	Yes	Yes	\$6,140	59%
Competitor 20	559	Gov	16	11%	Capacity	Capacity	No	No	\$0	100%
Competitor 21	561	Gov	16	10%	Spare	Spare	No	No	\$0	100%
Competitor 22	624	Private	17	9%	Spare	Spare	Yes	Yes	\$9,435	46%
Competitor 23	568	Gov	18	8%	Capacity	Capacity	No	No	\$0	100%
Competitor 24	572	Gov	19	7%	Capacity	Capacity	No	No	\$0	100%
Competitor 25	551	Gov	21	6%	Spare	Spare	No	No	\$0	100%

Define a local area for School X and enumerate potential competitors

The local market for School X was defined by the 95th percentile of commuting distances (21.7km).¹⁶⁸

All 25 secondary schools that were located within this 'School X's market' were listed in Table 8.

Apply the school-commuting function to answer the question, 'how likely is it that a student will travel to a competitor school?'

For each of these 25 schools, the likelihood that people would be willing to travel from School X to the competing school was calculated. This step was included to reflect the fact that, for example, Competitor 24 (which is estimated to be a 19km journey from School X) is less likely to present a competitive threat than Competitor 1 (an estimated 3km trip from School X).

The likelihood of commuting a particular distance was based on 2009 school commuting patterns in SEQ.¹⁶⁹ The calculated likelihood that a family will commute the 19km from School X to Competitor 24 (estimated at 7 per cent) is based on the SEQTS data, which suggests that only 7 per cent of current school commuters travel at least 19km.

By using the distance between School X and Competitor 24 to define the likelihood that School X students will travel to the competitor school, it is implicitly assumed that current School X students are evenly dispersed around the School X campus, i.e.

that on average the extra distance students will have to travel to get to Competitor 24 will be the distance between the two schools. This is a limitation of the analysis, as it would be preferable to estimate the marginal increase in distance (in switching, say, from School X to Competitor 24) from the perspective of SA1s or, better still, households.

Identify which schools are at capacity

Capacity data for each of School X's 25 potential competitors were assembled from the Queensland Government data¹⁷⁰ and from the primary research.¹⁷¹ After exhausting these sources, three schools still lacked capacity information.

Identify schools which are 'at least as high-performing'

The baseline assumption is that a school is 'at least as high-performing' as a counterpart if its average Year 9 NAPLAN score (the mean taken across all domains and years of data) is greater than or equal to the other schools. In the case of School X, this required that schools had an average NAPLAN score from 2008-11 of greater than 578. This was the case for 14 schools.

¹⁶⁸ See Figure 13 for the whole distribution.

¹⁶⁹ Queensland Department of Transport and Main Roads (2009).

¹⁷⁰ Department of Education Training and Employment (Qld) (2012).

¹⁷¹ See description on page 43.

Use the affordability function to answer the question ‘how likely is it that a household considering School X will be able to afford various competitor schools?’

This piece of analysis first required us to build an income profile of students in School X’s catchment area. In an effort to model the *typical* School X household, this area was defined by SA1s within the median travel distance (5.4km) of the school.¹⁷² The overall income distribution of SA1s in this area was calculated, and then performed calculations similar to those in Table 7 (at each of the fee levels being charged by the 12 private schools in the sample of 25 competitors). It was estimated, for example, that a typical household in School X’s catchment area would have a 19 per cent likelihood of being willing to pay the \$18,232 p.a. to attend Competitor 15.

Finally, these figures were divided by the likelihood that a household in School X’s catchment area could afford School X’s fees. That is, the estimate of the probability that a current School X student could afford a competitor school.

This adjustment is made to reflect the fact that households with children at School X are not a random sample of households in the School X’s catchment area. Moreover, for competition to be effective, the relevant sample is not simply the people who live around School X, but rather School X’s current (and prospective) student body.

¹⁷² We chose this distance, rather than the 95th percentile as the broader area – extending 21.7km – would be less indicative of the average School X student.

Final analysis for School X

The analysis was summarised in terms of the overall competitive picture for School X (Table 9), and in terms of the nearest open, clearly better competitor (Table 10).

Table 9: Summary analysis for School X

Total number of competitors	25
Number that are ‘at least as high-performing’	14
Number that are ‘at least as high-performing’, and have spare capacity	4

Table 10: Information on School X’s nearest competitor

Nearest open at-least-as-good competitor	Competitor 8
Distance from School X to Competitor 8	9km
Probability of travelling	26%
Fees at Competitor 8	\$8,190
Probability that School X current households will be able to afford \$8,190 p.a.	49%

Finally, the strength of competition faced by School X was defined by:

- The probability households would commute the distance between School X and its nearest open, at-least-as-good competitor (Competitor 8): 26 per cent

- The probability that households in School X catchment area would be able to pay the (higher) Competitor 8 fees: 49 per cent

The product of these two numbers is 12 per cent, which is above the baseline threshold of ten per cent (below which it is assumed that competitive forces will be weak).

A.3 Sensitivity analysis

This section has three parts. How robust the core results are is investigated by changing in three assumptions:

1. **definition of competition.** In the baseline analysis, schools' competitors had to be 'at least as high-performing' in terms of average Year 9 NAPLAN score. In this section, the competitive landscape changes if it is assumed that only 'clearly better' competitors can threaten a school's enrolments.
2. **definition of the local area.** In the baseline analysis, competitors were defined by a boundary extending a distance 21.7km from a school (i.e. the 95th percentile of observed school commuting distances).
3. **definition of 'very limited' competitive pressure.** The baseline analysis makes the assumption that schools face very limited competitive pressure if less than ten per cent of households in a school's core catchment area have a viable alternative (where 'viable' is defined by the product of the likelihood that people will travel to the nearest competitor

school and the likelihood that they will be able to afford the fees at that school).

A.3.1 Changing the definition of competition, to only include 'clearly better' schools

It's plausible that schools only feel a strong competitive threat from schools that are clearly outperforming them. In other words, their enrolment levels will not be jeopardised by a school that is achieving similar reported outcomes.

As such, an alternative definition of a school facing competition is that a competitor school must be 'clearly higher performing'.

It's difficult to know how big the gap in average performance between two schools needs to be for parents and students to perceive one school as 'clearly higher performing'. Moreover, users of performance information may well differ in the variables they focus on.

Notwithstanding these challenges, the approach remained consistent and limited the attention to raw NAPLAN performance. The assumption is then that the magnitude of difference in NAPLAN results required for parents and students to perceive it as performing at a 'clearly higher' level, corresponded with the performance gap associated with 'coloured bar' designations on the *My School* website.

Consequently, two gaps associated with being 'clearly higher performing' were defined:

- 14.6 points. This represents the smallest gap required for the *My School* website to indicate that one school is performing 'above' a particular benchmark (whether that be a national average, or a comparator school). A gap of 19 points at the Year 9 level, for example, means the school will receive a pale green bar, indicating superior performance.¹⁷³
- 36.6 points. This represents the smallest gap required for the *My School* website to indicate that one school is performing 'substantially above' a benchmark.¹⁷⁴

Table 11 illustrates how the main results change under these alternative assumptions (as a comparison the baseline assumption that a nearby school could be classified as a competitor if its NAPLAN performance was \geq the school being analysed is included).

Clearly, this variable has an impact on the results. In the report, the most conservative assumption is used: that a comparator school can be classified as a competitor provided its NAPLAN score is at least as high as School X. If it is assumed that only 'better' comparator schools jeopardise the enrolments of any particular school (where 'better' is defined by the smaller NAPLAN

¹⁷³ A school receives an 'above' [pale green] rating, if it is greater than 0.2 s.d. above a benchmark or comparator school (Australian Curriculum Assessment and Reporting Authority (2013b)).

Our 14.6 number uses this definition in combination with the distribution of results in NAPLAN's 2011 Year 9 testing (NAPLAN (2011); by way of example, see p.194 for reading).

¹⁷⁴ 'Substantially above' is defined as greater than 0.5 s.d. above a benchmark. See above footnote for sources.

difference of a 14.6 point gap), then the percentage of schools that have zero competition increases from 22 per cent to 41 per cent. The total number of schools that face limited or no competition increases from 43 per cent to 60 per cent.

Under the stricter assumption that people will be drawn to non-local schools only by substantially better performance (here defined as a 36.6 point gap), then over 80 per cent of schools in the sample faced no significant competition.

A.3.2 Changing the definition of 'local areas'

The extent to which school markets are 'local' will depend on individual household circumstances, and may vary according to a number of factors, including:

- access to car/public transport
- the perceived quality of a school compared to local offerings. This could be based on academic performance, religious teaching, etc.
- the location of a parent's work
- where school-age siblings are enrolled
- income

Of these, only income was considered in the analysis although it was ultimately discarded as a predictor of commuting distance, based on the small and weak relationship it had with school commuting distances (NETWORK_DIST) in the SEQTS.

The definition of a local area has an impact on the overall competitive landscape, as illustrated in Table 12. As expected, if the definition of a school's local area contracts, the level of competition it faces tends to decrease. For example, if each school's local area extends out 5.6km (rather than the 21.7km in the baseline analysis) then 74 per cent of schools in the sample are assessed as not having a viable competitor. That is, with this stricter definition of 'local', almost three quarters of schools in the sample don't have a local competitor that is at least as high-performing, and free of capacity constraints.

The dual impact of the 'local area' and 'clearly better' assumptions are presented in Table 13. Taken together, Tables 11-13 illustrate that while competition is generally limited, its absence becomes more striking when the restriction is imposed that people don't travel more than 5.4 km. This may have significant implications for people who don't have a car or access to public transport. The tables also underscore that if attracting students away from their local school requires that competitors have to be better than local rivals, then currently, competitive forces are absent for very large numbers of schools.

A.3.3 Changing the definition of 'very limited competition'

The analysis identifies both schools that do not have competitors in their local area, and those whose competitors are still local, but are either relatively far away, or significantly more expensive.

If it is estimated that a school's closest competitor would be a viable proposition for fewer than ten per cent of their current student base, then this school is labelled as facing 'very limited competition'.

The effect of changing this ten per cent threshold is illustrated in Table 14. As expected, the definition of 'clearly better' has an impact on the percentage of schools classified as facing limited competition. It is for readers to form a judgment of what threshold is most appropriate, but note that the calculated proportion of students who are subject to competition is simply those who feasibly have a better (or similar) option. It does not represent the proportion of current or potential students that would/will switch. Therefore, the ten per cent figure is a conservative threshold, below which it can reasonably be said that limited competitive pressures exist.

A.3.4 Large increase in government school capacity

One of the strongest responses open to governments to spur competition would be to increase the capacity of state schools.

The effect of removing government-school capacity constraints is modelled in Table 15. This is obviously a very strong assumption, and would be very costly. Despite the magnitude of the change, however, Table 15 shows that a significant proportion of schools continue to face limited or no competition. In one plausible scenario, for example, this change results in the overall percentage of schools who face no or limited competition declining from 63% to 49%.¹⁷⁵

There are a variety of reasons why this major change doesn't have more of an impact. First and foremost, school markets are local. Although people's preferences for school commuting may

¹⁷⁵ This is with local areas set at 11.4km, and with students only attracted to competitor schools with NAPLAN scores at least 14.6 points higher.

change if very high quality but distant public schools opened their doors, it would still likely be the case that many people would not be able or inclined to access them. Second a majority of the high-performing schools that might offer competition are private (and so remain unaffected by the change). Last, high performing government schools are often in areas where there is already more competition (which means that increasing capacity will, at the margin, result in a less impressive increase in the number of schools facing competition). This illustrates the fact that, while capacity constraints in government schools are problematic, addressing this issue will not fuel system-wide competition.

A 3.5 Substantially reducing private school fees

Another possible avenue to increase competition would be to advance policies to reduce private school fees. The effect of reducing fees is illustrated in Table 16. Once again, it's notable that even a dramatic shift – in this case a 50% reduction in the fees of private schools – does surprisingly little to increase the number of schools facing competition. This underscores the primary point that to make a substantial difference to the competitive landscape would require a fundamental shift in not just one, but a number of areas: government and private school capacity; willingness to travel; and private school fees.

A 3.6 Comparing SEQ to the rest of Queensland: some preliminary estimates

As SEQ is Queensland's highest density area, we would expect this area to have the fiercest competition, and that in other areas of the state – especially more rural settings – competition between schools would, on average, be less intense.

To understand the magnitude of the differences, an analysis was run for the “rest of Queensland”. All the data described in part 1 of this document were available, with the exception of school commuting information (for which we were not able to an SEQTS substitute).

In response to the lack of commuting data, the very rough assumption was made that people outside of SEQ will be willing to travel twice as far as those in the study area. That is, the willingness-to-travel function will be double that presented in Figure 5 (on page 11). For many of the people living outside the SEQ study area, this assumption will be excessive (especially for those living in urban areas like Cairns) but without better information we err on the side of caution.

The results of the analysis (under 2 scenarios) are presented in Table 17. This is far from exhaustive, however it illustrates an important point: the issues and structural barriers to competition in SEQ will likely be magnified in less-densely populated areas.

Table 11: Sensitivity to different definitions of 'clearly better'

	Ave. # Schools that could be competitors	Ave. # of those that are 'clearly better'	Ave. # that are better AND OPEN	Ave. distance to closest competitor (where one exists)	Ave. prob that closest competitor is private	Ave. fee of closest private competitor	% of schools with no competitive threats	% of schools with very low competitive pressure
'Clearly better' = 0 NAPLAN points [baseline]	42	20	5	8.5km	75%	\$7,741	22%	21%
'Clearly better' = 14.6 NAPLAN points	42	15	3	8.7km	71%	\$7,590	40%	20%
'Clearly better' = 36.6 NAPLAN points	42	8	1.5	10.1km	64%	\$6,877	63%	18%

Note: Other assumptions are at baseline levels; local boundary defined by 95th percentile school commute; 'very limited competitive pressure' is defined as 10% of the catchment area being likely to travel to and pay for a competitor.

Table 12: Sensitivity to different definitions of 'local area'

	Ave. # Schools that could be competitors	Ave. # of those that are 'clearly better'	Ave. # that are better AND OPEN	Ave. distance to closest competitor (where one exists)	Ave. prob that closest competitor is private	Ave. fee of closest private competitor	% of schools with no competitive threats	% of schools with very low competitive pressure
35.2km (99th percentile)	79	37	10	10.2km	82%	\$7,834	12%	30%
21.7km (95th percentile) [baseline]	42	20	5	8.5km	75%	\$7,741	22%	21%
11.4km (80th percentile)	15	7	2	6.1km	65%	\$6,565	41%	7%
5.4km (50th percentile)	3	1	0	3.8km	56%	\$7,256	74%	1%

Table 13: Percentage of schools that face limited or no competition

Local area	35.2km	21.7km	11.4km	5.4km
Clearly better	(99th percentile)	(95th percentile)	(80th percentile)	(50th percentile)
0 NAPLAN points	42%	43%	49%	76%
14.6 NAPLAN points	60%	60%	63%	82%
36.6 NAPLAN points	81%	81%	82%	91%

Note: Other assumptions are at baseline levels; 'very limited competition' threshold is at ten per cent.

Table 14: Sensitivity to different definitions of 'very limited competition'

'Very limited competition' threshold	% of schools with very low competitive pressure
5%	7%
10%	21%
20%	41%

Note: Other assumptions are at baseline levels; local boundary defined by 95th percentile school commute; all schools with average NAPLAN \geq the school under analysis are considered as competitors

Table 15: Scenario: reducing capacity constraints
Percentage of schools facing no or very limited competition

		Current capacity constraints	Remove all government-school capacity constraints
<i>Local area = 21.7km</i>	"Clearly better" = 0	43%	30%
	"Clearly better" = 14.6	60%	43%
	"Clearly better" = 36.6	81%	70%
<i>Local area = 11.4km</i>	"Clearly better" = 0	49%	34%
	"Clearly better" = 14.6	63%	49%
	"Clearly better" = 36.6	82%	75%

Note: "Very limited competition" is set at 10%

Table 16: Scenario: reducing private school fees
Percentage of schools facing no or very limited competition

		Current prices	50% reduction
<i>Local area = 21.7km</i>	"Clearly better" = 0	43%	33%
	"Clearly better" = 14.6	60%	51%
	"Clearly better" = 36.6	81%	76%
<i>Local area = 11.4km</i>	"Clearly better" = 0	49%	41%
	"Clearly better" = 14.6	63%	56%
	"Clearly better" = 36.6	82%	77%

Note: "Very limited competition" is set at 10%

Table 17: Comparison of SEQ and “rest of Queensland”

		Ave. # Schools who could be competitors	Ave. # of those who are “clearly better”	Ave. # who are better AND OPEN	Ave. distance to closest competitor (where one exists)	Ave. prob that closest competitor is private	Ave. fee of closest private competitor	% of schools with no competitive threats	% of schools with very low competitive pressure
SEQ (n=234)	Clearly better = 0	42	20	5	8.5km	75%	\$7,765	22%	21%
	Clearly better = 14.6	42	15	3	8.7km	71%	\$7,610	41%	20%
Rest of Queensland (n=217)	Clearly better = 0	6	3	2	12.7km	52%	\$4,823	42%	11%
	Clearly better = 14.6	6	2	1	13.9 km	53%	\$4,971	53%	11%

Notes: Assumptions for SEQ local are set at 21.7km for SEQ; “very limited competition” set at 10%.
Assumptions for “Rest of Queensland” local area set at 43.4km; note that in the absence of quality commuting data, we make the assumption that households out of South East Queensland are willing to travel twice as far as those within the study area; “very limited competition” set at 10%.

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