Department for Education

School performance and parental choice of school: secondary data analysis

Research Report

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Introduction

This report focuses on the school choice system in England, which is a key component of the market-based accountability that is central to raising standards. It seeks to inform the broad question of whether parental choice of school works well in an increasingly autonomous school system. With more than half of secondary schools converted or converting to academy status, there will be less direct oversight of schools. Hence more reliance will be placed on market-based accountability to ensure schools are kept up to the mark.

It seems clear from the international evidence that some parents do not choose schools by placing a large weight on school performance. Besides the implication of this for individual students, this has a systemic impact in that poorly performing schools may be insufficiently pressurised into improvement if their admissions stay ‘undeservedly’ high, and parental choice will be blunted as an accountability mechanism. This poses a policy dilemma: acknowledge parental support and allow a school to continue as it was, or intervene ‘against the market’.

There are challenging questions here – there is little basis for describing some parental choices as ‘acceptable’ and others as ‘unacceptable’. Parents value other aspects of schools besides academic performance and different parents in different circumstances may evaluate the trade-off between these aspects in different ways. They may for valid reasons not necessarily always choose the highest performing school.

There is continuing concern among policy makers about the attainment gap between disadvantaged students and their better-off peers. Since families making the identified choices are often thought of as coming disproportionately from disadvantaged families, this has a direct bearing on understanding this issue.

A question to consider is whether there is any basis for seeking to influence these parental choices, in either a direct or indirect (‘nudge’-type) manner. Should parental preference be paramount in a school choice system, or should the state have some role through benevolent paternalism?

Literature Review

The literature review contrasts economic and sociological theories of parental choice of schools and summarises the evidence for why there may be systematic differences in the ways that parents choose schools.

Social class differences in school preferences emerge: middle classes tend to value performance and peer group; lower SES groups may look for accessibility, friendliness of staff and support for those of lower ability. This may lead lower SES groups to select themselves out of high performing schools either by prioritising school aspects other than academic performance, or to avoid possible rejection or failure.

Disadvantaged families (by definition) have access to less in the way of resources, which can (a) limit the range of schools which they can consider due to transport costs, and (b) prevent them from accessing supplementary tuition.

The middle classes tend to have access to higher quality information on schools and be more adept at using it. The publication of performance tables and Ofsted reports aims to level the playing field in this regard, but cannot compensate for 'soft' knowledge of local schools. More seriously, the complexity of the current system of school admissions makes it difficult to successfully state school preferences on the admissions form without the capacity to estimate chances of being allocate a place.

Whilst differences in parental preferences for school characteristics are not amenable to policy intervention, it is possible to offer financial support or provide services to overcome income deficits. Many government interventions have attempted to compensate for the informational deficit that many families face: simplification of the admissions process to lower informational requirements is the most obvious route to improving the school choice experience for all parents.

Analysis

Our data analysis attempts to assess the scale of the issue. We use the National Pupil Database (NPD) and adopt an econometric approach. We focus on simple, specific, quantitative questions, to estimate the proportion of students whose parents chose to send their child to one school despite there being a higher-performing school apparently with spare capacity, and to examine the characteristics of those parents.

Having identified students whose parents could apparently have chosen a higher-performing school for them, we assess how much difference it would make to their academic performance to hypothetically re-assign them to other schools. This necessarily involves further modelling assumptions; to keep a degree of realism, we do not assign students to schools beyond the numbers that they currently take and the analysis is strongly dependent on assumptions we made about capacity. We simulate such an assignment many times and average over the outcomes to evaluate the likely impact on attainment if these parents had chosen different schools. We derive our estimates of the impact of schools on pupil attainment from fixed effect regressions, which we cannot consider to represent causal relationships.

A major difficulty in this report is that we are attempting to analyse parental preferences and school capacity without any data on preferences and only very imperfect data on capacity. Consequently, the results should be seen as tentative and exploratory.

Results

We estimate that between 5% and 10% of both secondary school students and primary school students could have chosen to attend a higher-performing school with spare capacity. Turning the question around, about 3% of secondary schools (1% of primary schools) appear to have places available despite performing better than their local competitors. We reiterate that these numbers are estimates, based on a set of strong assumptions, because there is no data available on the actual choices parents make, and only poor data on school capacity.

The average percentage of such students in secondary schools is around 9% (10% of primary school students), but it is higher for disadvantaged students. Students who are FSM-eligible and live in deprived neighbourhoods are much more likely to be attending a school despite there being a local higher-performing school apparently with spare places. Asian students are less likely to meet this definition and Black students more likely.

Bearing all the caveats in mind, our results show non-trivial gains for some groups in some places: some LAs might find average gains of between 10% and 20% of a pupil-level standard deviation of GCSE points score, if students chose to attend a higher-performing school. Gains appear to be slightly higher in primary schools, with gains in some LAs being 30-40% of a standard deviation. Since these gains are predominantly for FSM-eligible students, they also serve to narrow the attainment gap. The mean gain for FSM-eligible students is around 2 GCSE grades per student, and the mean gain for non-FSM students is 1.6 grades.

Recommendations

We cannot say on the basis of this study alone that (somehow) encouraging disadvantaged families to place greater weight on school performance when making school choices would be likely to increase overall attainment, and reduce the attainment gap; this study has much more modest ambitions as set out above. It is worth re-emphasising two things when interpreting these numbers. First, we have no data on parents' chosen schools so can only infer their preferences from their local context and we have no data on true school capacity so have to rely on further assumptions to estimate capacity. Second, there are obviously other factors involved in parents' choices of school and the fact that some are apparently not choosing the highest performing school may simply be reflecting that those other factors are important too.

While this group of students (attending a low-performing school because they chose it) is of interest, another group (attending a low performing school because they could not get in to a higher-performing one) is more numerous and plays a greater role in explaining the attainment gap. The proximity rule for school admissions is a large factor limiting choice for these students.

Throughout this report we have emphasized the extent to which the analysis has needed to rely on assumptions. This problem arises from lack of data on parental preferences and school capacity. Such data could be obtained and we would recommend doing so if the study is to be followed up. We believe it would be highly risky to base policy proposals solely on the findings of the current study.

If it were then shown to be the case that significant numbers of parents were making decisions for their children to attend schools other than the highest performing, then it might be appropriate to consider some of the policies discussed in the Evidence Review section.

1. Introduction

One of the fundamental issues that all school systems have to deal with is which students should attend which schools. There are various ways that this can be done, but in England the system is based on parental choice. Families are invited to nominate a ranked list of preferred schools for their child. If there is space at these schools, then the parents' choice is decisive. If a school is over-subscribed, then other criteria come into play, but the parents' choices remain an important input into the assignment.

This report focuses on one aspect of this system, analysing a particular type of choice made by parents that, in a sense made precise below, might be considered dysfunctional for the system. The broad question is whether parental choice of school works well in an increasingly autonomous school system. With more than half of secondary schools converted or converting to academy status, there will be less direct oversight of schools. Hence more reliance will be placed on market-based accountability to ensure schools are kept up to the mark.

In principle, market-based accountability should work well. There is a lot of information available on school performance, and parents' choices are key to the outcome. The idea is that parents should base their choices largely on school academic performance, thereby keeping schools on their toes and ensuring high standards throughout the system.

But it seems clear that at least some parents do not choose in this way. There are two potential impacts: individual and systemic. The nature of the systemic impact is clear; poorly performing schools may be insufficiently pressurised into improvement if their admissions stay 'undeservedly' high, and parental choice will be blunted as an accountability mechanism. This rather abstract argument is illustrated by the case of Downhills primary school during 2012. This was a poorly-performing school that officials felt needed strong action to turn it around. Despite its poor performance and the nearby availability of other schools, the school continued to attract local support. This posed the policy dilemma: acknowledge parental support and allow the school to continue as it was, or intervene 'against the market'.

For the impact on the individual student, the standard economic argument would be that the parents making the choice took into account all of the aspects of the available schools and decided on balance that their child would be better off at the school they chose. The only counter arguments to this would be that the parents were mis-informed, or that the preferences underlying their choice were somehow inappropriate – for example, discounting the future too heavily.

There are a number of deep questions here – there is little basis for describing some choices as ‘acceptable’ and others as ‘unacceptable’. Parents value other aspects of schools besides academic record and different parents in different circumstances may evaluate the trade-off between these aspects in different ways and not necessarily always choose the highest performing school. A second question is whether there is any basis for seeking to influence these choices, in either a direct or indirect (‘nudge’-type) manner. Should parental choice be paramount in a school choice system, or should the state have some role through benevolent paternalism?

In the literature review we discuss attempts to understand some of these complex issues in, give an overview of how and why there exist social class differences in engagement with the school choice process, and review existing government attempts to overcome some of these differences. In our data analysis we begin to address the scale of the issue by focussing on simple, specific, quantitative questions: how many children may not be going to their highest performing available school? How many low performing schools retain an “undeservedly” large number of pupils? Who are the pupils who are not going to the best available school? Are some groups of pupils over- or under-represented among them? A more in-depth approach to these issues is beyond the time frame for this study, and – more importantly – beyond the capability of the available data.

We attempt to answer these questions by examining parents who chose to send their child to one school despite there being a higher-performing school with spare capacity. We present three sets of results:

- We quantify how many students appear to be in this category, and how many schools are high-performing but not full;
- We identify the typical characteristics of the students in this category;
- We carry out a counter-factual analysis: we hypothetically re-assign students to different schools in a way that takes more account of school performance and quantify the gain in mean attainment.

A major limitation of this report is that we are attempting to analyse parental preferences and school capacity without any data on preferences and only very imperfect data on capacity. Consequently, the results should be seen as very tentative and exploratory. The way we attempt to deal with this is set out in the Data section below.

Part of the backdrop for this report is continuing concern about the attainment gap between disadvantaged students and their better-off peers. International evidence suggests that this is particularly sizeable in England relative to other countries. Since we show that the parents making the identified choices are disproportionately from

disadvantaged families, our findings have a bearing on understanding this discussion.

There is an important point to make, however, in thinking about the potential contribution of school assignment to the socio-economic attainment gap. The key distinction (and the empirical challenge that we deal with below) is between a student attending a low-performing school because they chose it, and attending a low performing school because they could not get in to a higher-performing one. This analysis tries to provide some scale and characterisation of the first phenomenon; we strongly believe that the second is far more important in explaining the attainment gap, and that the proximity rule for school admissions is a big part of that.

The following section makes precise the definitions of all our terms, and describes the data. Section 3 counts and describes the families making such choices and section 4 reports the results of the counter-factual analysis. Finally, section 5 concludes.

2. Literature review

It is known that in England secondary schools are socially stratified, with children from socially disadvantaged backgrounds distributed unevenly across schools. Segregation of disadvantaged pupils between schools could be a problem for reasons relating to wider cohesion within society, but also because schools with greater proportions of disadvantaged pupils face extra teaching and behavioural challenges and less advantageous peer effects, feeding into unequal educational quality between schools. These 'school effects' are known to account for 8-15 per cent of variance in student academic achievement (Reynolds, 1992); pupil peer effects in particular are known to impact on school/ pupil performance (Robertson and Symons, 2003; Dills, 2005; Ammermueller and Pischke, 2009) and on how much or how little schools improve over time (Levacic and Woods, 2002). Although home background – rather than what school a child attends – is by far the most important factor in predicting how well a child will do at school, matters of school quality and composition remain important. Reducing segregation to ensure an even spread of disadvantaged pupils across schools could therefore be beneficial.

Potential causes of stratification between schools arise from both supply of and demand for school places:

1. On the supply side, schools may use overt admissions policies, such as selection by residence, ability, religious adherence, or more covert procedures, to 'cream-skim' more able or easier to teach pupils.

2. On the demand side, actions of parents such as how they go about choosing schools, but also where they live and the extent to which they can afford to travel, affect which schools their children attend.

This report looks at evidence as to why there are differences in the way that families from different social backgrounds choose schools, drawing on literature from both qualitative sociological and quantitative economic traditions. It uses findings from this literature to reflect on a set of government interventions that have been designed to improve the school choice experience for those currently most disadvantaged in the process.

One overarching finding emerging from research is that parents on the whole do value their children's schooling and they are concerned about matters of quality such as school academic performance and discipline. These desires for a high quality education for their child are typically balanced against a preference for a local school and consideration of the child's wishes (Flatley et al., 2001; Bradley and Taylor, 2007; Coldron et al., 2008). The desire for educational quality is borne out in house price data in the US and the UK, where high performing schools contribute significantly to urban house price variation (Black, 1999; Gibbons and Machin (2003; 2008). There is also reasonably strong support for school choice. Data from the 2010 British Social Attitudes (BSA) survey has shown that while 61% of parents with children aged 16 or under believe people ought to send their child to 'the nearest state school', a further 23% say they would only agree with this if 'the quality and social mixes of pupils between schools was more equal'. Such a finding suggests concern about quality, as does the finding that 41% of parents feel it is acceptable for parents to avoid the nearest state school where this school's exam performance is weaker than school exam performance elsewhere. Overall, 72% of parents in Britain believe they ought to have a 'basic right to choose' (Exley, 2011). High support for choice here might imply that it is valued intrinsically by parents (not merely as a means by which they can secure higher quality schools), though a US study has understandably shown that support for school choice tends to be lower in neighbourhoods where school quality is high (Brasington and Hite, 2012).

a. Social inequalities in parental choice

The observation that family school choice outcomes differ by social class is one which has been witnessed and documented a great deal in academic research. Studies of the impact of the 1988 Education Reform Act showed that families already advantaged were more likely to gain places at desirable schools than disadvantaged families (Conway, 1997; Levacic and Hardman, 1998; Reay, 1998). Burgess and Briggs (2006) have shown that pupils eligible for free school meals attend worse schools than those *not* eligible for free school meals living on the same street. In the US, Hastings et al. (2006a) have shown that low income families are less likely to exercise choice in a public school lottery system. DeLuca and Rosenblatt (2010)

show that the famous Moving to Opportunity relocation of disadvantaged families across the US did not particularly improve children's achievement, principally because those moving either could not or chose not to access higher quality schools. And of course, where choice is only possible through house moves in a strict neighbourhood schooling system, it has been shown that children from low income and less-educated backgrounds experience lower attainment school peer groups (Black, 1998; Bayer and McMillan, 2005).

However, empirical observations such as this contribute little to our understanding of *why* a relationship exists between school choice and social class. Without an understanding of family decision making processes contributing to differential school choice behaviour, researchers cannot predict the magnitude of the change in sorting between schools that is likely to result from a particular policy implementation, with the result that it is not possible to devise cost-effective policies likely to succeed in lowering social segregation and increasing educational equity.

b. Economic models of parental choice

Economic or rational choice models currently prevalent in the school literature present parents acting in a rational manner, making choices of school from well-defined choice sets with the goal of maximising household well-being based on fixed preferences and subject to budget constraints. Although these reductionist models contradict a wide body of experimental evidence demonstrating that human behaviour deviates in systematic ways from the idealised utility maximiser (Tversky, 1996), they can still be a useful approximation of human behaviour (Roth, 1996). In fact, arguably the school choice decision is better described in terms of this economic decision-making than many other decisions in life: it is usually a conscious, deliberate and considered decision, made in the presence of considerable information.

Within this framework, it is possible to model parents as differing according to social class, or socio-economic status. Economists give three distinct explanations for why parents of different social classes choose different schools, described below.

i. Income constraint

In modelling social class differences in school choice decisions, the first perspective is that the tighter budget constraint of low income families is sufficient to explain their inability to purchase houses next to popular schools, pay for private tuition for entrance tests, or take long journeys to school. Under this account, the underlying preferences of lower and middle class families for schools are no different. The policy implications of this would be that social stratification between schools could be significantly lowered by reducing the costs of accessing schools for low income

families; for example, by designating places at schools for out-of-catchment children or by subsidising transport to school.

However, econometric estimates of house location decision suggest this explanation is not sufficient on its own to explain observed school stratification. Bayer and McMillan's research takes an area (San Francisco) where choice of school is only possible by moving house because strict residence requirements are in place and find significant evidence for differences in preferences in the sense that more educated parents are willing, *other things being equal*, to pay more for high quality schools (Bayer, 2000; Bayer and McMillan, 2005). This finding is confirmed by Nesheim (2002), who uses a similar approach to estimate a correlation between parental education and willingness to pay for school quality (given income) of 0.59. Schneider et al. (2000) also find that the preferences of parents for certain schools are due in part to their ethnic and socio-economic status.

ii. Different preferences for school quality

Economic models can introduce a second reason for social class differences in school allocations by asserting that preferences for school quality will differ by parental background, with the utility derived from greater school quality being lower for low social background families. This may be because these families underestimate the importance of education for their children's future earnings, or because they place a greater value on the family's current well-being than on their future income status. This difference in preferences might manifest itself in several ways. The family may be less willing to substitute consumption for school quality 'purchased' through the housing market or transport costs. Alternatively, the family may calculate that the utility gain from superior school quality is not enough to offset utility loss from longer journeys to and from school. Furthermore, other aspects of the school environment may enter the utility function, and they might place significant utility on the child's own expected happiness at secondary school, thus favouring allowing their child to continue to be educated with friends.

Hastings et al. (2006b) use outcomes from a randomised school lottery to show that variation in preferences for school quality may rationally arise because capacity to benefit differs across types of children. They are able to show that the children of parents whose choices revealed a strong preference for academic quality experienced significant gains in test scores as a result of attending their chosen school, while children whose parents weighted academic characteristics less heavily experienced academic losses from choice. They therefore provided empirical support for the thesis that for children from backgrounds where education is valued less, gains from attending a high performing school could be limited, and so may be heavily outweighed by other objectives, such as a desire for proximity and same social background peers.

iii. Informational advantages

A third economic explanation for differences in school choice strategies is that higher social background families are endowed with an informational advantage (from social networks, for example). Parents naturally have special intimate knowledge of their child's interests and needs in terms of education (Lubienski, 2008), but this knowledge can only be acted upon where there is sufficient information about school characteristics and qualities. Lee and Fitzgerald (1996) have argued that sufficiency and accuracy of acquired information about education quality are essential for rational parental choice.

An informational advantage for middle class parents manifests itself in several ways. First, it gives these parents better measures of school quality. Second, they select a school from a larger choice set. Third, they have a superior ability to estimate the probabilities of acceptance at different schools, which is particularly important under a First Preference First (i.e. priority matching) choice system or an Equal Preferences system with limited stated options.

Middle class parents draw on their skills and social capital to gain information about school performance and admissions policies in a number of ways. West and Pennell (1999) show that high socio-economic groups appear to have better information on, and understanding of, school performance via league tables. Coldron et al. (2008) also report a social gradient in the use of formal sources of information regarding schools. Mothers who had qualifications at level 4 or higher (degree level) were three times as likely to use formal sources as those who had no qualifications. Also, families with parents who were in employment were more likely to use formal sources than either lone parent families or two-parent families where one or both parents did not work. They also report that internet access was important to a family's ability to access information about schools, which may place lower income families at a disadvantage in the process. Overall though, the most highly valued information was obtained informally, through school visits and talking to other parents and staff. Thus, parents with stronger social networks (social capital) were more likely to gain more useful information about local school quality and admissions. Survey data from the US supports the idea that social networks are more important than formal sources of knowledge about school choice (Hall, 2009), and Schneider et al. (2000) suggest that middle class parents have stronger social networks of 'high quality' information, with lower income families only able to use social networks to access less reliable data.

So, empirical evidence suggests multiple informational advantages are likely to be present for middle class parents. However, this explanation is, again, necessarily partial because an understanding is needed of the costs of obtaining information for

different groups, relative to their own perceived benefits in holding this information. It is perfectly possible that working class families place less value on this information.

c. Qualitative sociological accounts of parental choice

British qualitative sociological work since the 1990s has provided a rich descriptive base of evidence showing how families' social class is instrumental in shaping the manner in which they interact with school choice processes. Social class is distinct from income and education level, being seen as an economic, social and cultural phenomenon:

> 'an identity and a lifestyle, and a set of perspectives on the social world and relationships in it…' (Ball, 2003, page 6).

Bourdieu (1986) holds that individuals bring to bear on their choices in life a series of assets or capital (economic, social and cultural). Middle class advantage in school choice processes comes via economic capital (advantage in terms of financial assets and income); social capital (the social networks relied upon to inform school choice decisions) and cultural capital (the attitudes and knowledge, defined by those in power, which makes the education system a comfortable and familiar place in which they can succeed easily). These assets are passed from one generation to another as the middle classes seek "relative advantage, social advancement and mobility"

There are two parts to an argument explaining how a middle class advantage in school choice emerges. First is the suggestion that choice has different meanings in different class contexts (Gewirtz et al., 1995). This means that families of different social class backgrounds engage in the choice process differently. Second, and building on the first argument, the school choice mechanism in England requires time, effort, expense and skill; i.e.:

> [Resources and capital] that are unevenly distributed across the population but with which the middle class are particularly well endowed. The education market with all its risks is well accommodated to the dispositions and interests of the middle class (Ball, 2003, page 173).

Although the sociological studies claim the market favours the middle class, they also report that this group have a pessimistic view of the process of choice. Because the middle class believe that a child's educational success is crucial to their maintenance of social position, it means that they perceive that the consequences of not securing the 'right' school place are very serious. This risk arises from multiple sources: uncertainty about true school quality; uncertainty about how their own child will respond to different settings; and a chance they will not be allocated their preferred school.

The middle class are not just characterised as being advantaged in the process of securing a place at a good school; they also have a very specific notion of what constitutes 'good', and this is crucial to understanding why markets are likely to become stratified. Ball characterises middle class choice as being dominated by maximising a child's likely exam results where '*the school is not represented as an independent variable with qualities of its own separate from its intake*' (Ball, 2003, page 169). In other words, middle class parents have a narrow conception of quality as being analogous with expected test scores, and believe that the quality of a school largely depends on its peer group, almost irrespective of the quality of instruction.

Empirical survey evidence provided only limited support for the assertion that the middle classes choose schools based on peer group, but it is important to interpret all reported surveys somewhat cautiously because survey responses may not give an accurate estimate of parents' true preferences. For example, stated preferences may be altered to fit social norms, emphasising a high value for education quality and child's happiness and potentially downplaying concerns for a school's social and racial composition. So, while the BSA survey in 2010 showed that 41% of parents say it is acceptable to avoid a nearby school on the basis of its exam results, only 28% say it is acceptable to avoid that school on the basis of 'the backgrounds of pupils who go there' (Exley, 2012a).

By contrast, according to Reay and Ball, '*working-class patterns of educational choice are characterised by ambivalence, and appear to be as much about the avoidance of anxiety, failure and rejection as they are about 'choosing a good school for my child*' (Reay and Ball, 1997, page 93). There are two parts to this argument. First, the ambivalence is consistent with working class families viewing their child's characteristics as 'fixed' and not susceptible to school effects. The second part of the argument emphasises the contradictions and compromises in making choices because of the potential negative consequences of entering (or indeed being denied access to) a middle class school.

> Such choices could set working-class children to fail in individualised, publicly humiliating ways in predominantly middle-class, high-achieving schools as opposed to the more masked, shared processes through which they fail (or are relatively successful) in local, inner city comprehensives. (Reay and Ball, 1997, page 97)

Rather than choosing popular, high reputation schools, working class preferences are strongly shaped by parents' own economic position within the market and also parents' (often negative) experience of school (Woods, 1993). Bussell (1998) also argues that parents from lower socio-economic backgrounds are less well informed and tend to choose later than those from higher socio-economic backgrounds.

Working class parents prioritise and value not exam results (as middle class parents do) but the accessibility and friendliness of teachers, relying on ‘gut feeling’/intuition or favouring a sense of ‘being at home’. Pupil peers are regarded equally as important as they are for middle class families, but rather than seeking ‘like’ in terms of middle class high achievers, working class parents value the presence of children like their own, valuing what Coldron et al. (2010) term the ‘benefits of solidarity’, leading them to ‘opt for’ segregation. Often working class parents are impressed when schools give positive attention to less academically inclined pupils rather than focusing primarily on able students (Reay and Ball, 1997). Surveys show that in lower social class families the child's wishes are often decisive while for middle class parents the child's input into the process is limited (Coldron and Boulton, 1991; Ball, 1993). The result is that within middle class norms, working class families may appear to be `bad choosers', but this is entirely a cultural judgement (Reay and Ball, 1997).

Several US studies are also able to show robustly that low-income parents place lower value on academic characteristics when choosing schools (Fossey, 1994; Armor and Peiser, 1998; Schneider and Buckley, 2002; Jacob and Lefgren, 2007; Hastings et al., 2006a). Government research has also indicated that parents with less experience of formal education (i.e. those who left school at an earlier age) are less likely to feel confident in their ability to support their child’s learning and development (Peters et al., 2009; TNS-BMRB, 2010). However, Coldron et al. (2008) use survey findings to temper a ‘deficit model’ of parents from lower socioeconomic groups, as is prevalent in literature contrasting ‘skilled choosers’ and ‘disconnected choosers’ (Gewirtz et al., 1995) and ‘alert’ versus ‘inert’ (Echols and Willms, 1992), stating:

> It is a widespread assumption that parents from lower socioeconomic groups are being denied access because they are less able to understand the admissions process and therefore less able to successfully negotiate it. We found no evidence to support this. While more educated parents were likely to access more information very few parents felt they were lacking basic information about secondary schools and there was no evidence that parents who were less educated had any reduced chance of gaining their first preference. (Coldron et al., 2008, page vii)

Coldron et al. confirm that working class parents do not want to engage in the school choice process in the same manner as the middle classes do, and that they have different aspirations in terms of schools they wish their children to attend. However, overall there is an acknowledgement that working class cultures and preferences not only produce but are produced by economic circumstances. Working class parents

choose differently from middle class parents in part because their decision-making involves a rational adjustment to a structural lack of options:

> ‘the most improbable practices are … excluded, as unthinkable, by a kind of immediate submission to order that inclines agents to make a virtue out of necessity, that is, to refuse what is anyway denied’ (Bourdieu, 1990: 54).

> ‘Far from being ill considered, this reluctance represents a powerful common-sense logic in which to refuse to choose what is not permitted offers a preferable option to choices which contain the risk of humiliation and rejection’ (Reay and Ball, 1997: 91)

d. Government interventions

Sociological and economic literature described above points towards a number of reasons as to why parents in different social class groups engage differently with school choice processes. Choice carries different meanings among different classes; while middle class parents understand it as part of maximising their child’s future academic achievement (surrounding children with ‘like’ high achieving peers), working class parents focus on aspects of schooling such as friendliness, inclusion and a focus on the less academically able. It is morally quite hard for government to justify policies that deliberately seek to manipulate existing parental preferences. Instead, interventions might best focus on overcoming informational deficits, compensating for lower incomes, and/or raising chances of acceptance for disadvantaged children at high quality schools. Of course, by simply raising potential access to a greater number of schools it necessarily lowers risk of rejection and so may, *in fact*, indirectly change preferences for families with lower personal confidence in the process.

i. Overcoming information deficits

Government interventions to improve access to useful information regarding school choice should be uncontroversial, especially if the information sources are open to all and do not seek to explicitly manipulate existing preferences for particular types of schools. That said, there are many choices to make over what types of information to make available, carefully accounting for whether these sources are equally available and understandable for all parents, regardless of socioeconomic, racial, and educational status. It is possible that high quality, yet inaccessible, information could exacerbate existing inequalities, for example. Inaccessibility is only part of the problem since we also want parents to be able to make a rational choice based on the available information.

In this section, some examples of reforms to available information are listed, grouped from the least to the most personalised types of information. Personalised

approaches to information are very expensive, but may be more straightforward to navigate.

Types of information sources

Research has shown that families gain information on schools from a wide variety of sources, both formal and informal. The strengths and weaknesses of these sources are summarised by Hall (2009) and replicated here in Table 1.

Types of information	Sources	Strengths	Weaknesses
Informal/ relational	Friends Extended family Families in schools Co-workers	High levels of trust in the source Less "costly" for the chooser in terms of time and energy spent	Not always accurate Social networks are culturally/socially bound Favour higher-income, more educated families
Formal/ Media	Television Radio Newspaper Community centre Politicians Internet/ web-based	Able to reach many people simultaneously Multiple forms available	Scarce in terms of educational information Questionable reliability Need for choosers to have access to electronic media or have high level of literacy skills
School-based	Brochures Newsletters Web-pages Application materials Staff/administration PTA	Important factual and procedural information Creates connection between family and school	Biased in favour of school Propaganda Extensive "red tape" Language usually technical or advanced Intimidating – especially for younger and less educated parents

Source: Hall (2009) (table 2.1)

Formal sources of information are clearly the most amenable to policy manipulation, but they may not be the most important. Research by Brasington and Hite (2012) has shown that parental *subjective opinions* about schools are at least as important as formal exam performance tables in fuelling demand for school choice. Also, decision-making may not currently follow systematic, rational approaches so there is room for informational interventions to reflect this. Schneider et al. (1999) report on parents' use of 'heuristics' or 'shortcuts' in making judgements about schools based on visual cues (for example a lack of broken windows or graffiti) which do successfully allow parents to identify higher performing institutions. The possibility of improving school choices among less affluent families is argued to be real, because:

> "even in the absence of encyclopedic information, visual cues can lead parents to choose schools that perform well on the dimensions of education about which they care." (Schneider et al., 1999: 738).

Identifying the most effective schools

For school choice to be effective in raising achievement for children from disadvantaged backgrounds, it is necessary to show that parents are capable of identifying effective schools. The evidence for this is rather mixed. In England, for example, we know that while many are interested in school performance tables, only 36% of all those who use such tables report an interest in value added scores, arguably the most accurate published measure of school quality (Coldron et al., 2008). By contrast, 80% of all those looking at performance tables are interested in unadjusted school GCSE/A-level results, even though the overwhelming determinant of these is not the quality of instruction pupils receive (rather the prior attainment of pupils attending a school).

Subjective judgements on the part of parents rather than a reliance on solid data may explain mixed research findings regarding the impact of government school choice programmes on pupil outcomes. Looking at the experiences of 'lottery winner' pupils attending New York charter schools, Hoxby and Murarka (2009) have found small positive effects of school choice on maths and reading scores. Hastings and Weinstein (2008) have also concluded that where lottery winning parents choose schools with higher exam scores, pupil test scores increase. Deming et al. (2011) have shown that lottery winning students whose parents have exercised choice are more likely than others in their neighbourhood to graduate from high school, attend elite universities and gain bachelor's degrees. However Cullen et al. (2003 – see also Cullen and Jacob, 2009) cast doubt on such findings in their research on Chicago public schools. They find that in a context of lottery allocation to the most sought after school programmes, lottery winner children do attend schools with higher peer achievement rates and lower levels of poverty, but they derive no clear benefit regarding standardized test scores. This evidence, combined with English

surveys of school quality metrics used by parents, suggests we cannot conclusively assert that parents will necessarily choose a school that maximizes their child's chances of exam success.

Errors by parents in the school choice process have been shown to occur in research from around the world. Using data from China, Lai et al. (2008) showed that students from low-income households were more likely to make judgment errors in the school choice process, resulting in their attendance at lower quality schools. Lucas and Mbiti (2011) also found that girls and lower achieving students in primary schools in Kenya were more likely to make mistakes in school selection processes such as coding errors or applying to schools where they had zero chance of gaining a place. However, on a more positive note, Ajayi (2011) found that where talented students from low-quality primary schools in Ghana were less likely to apply for more selective secondary school places, reforms providing students and parents with more information eliminated some of this disparity, thereby encouraging economic mobility.

League tables and school brochures

One measure often promoted by governments as part of school choice programmes is an enhanced provision of basic, accessible information in order to counter imbalances in knowledge between middle and working class families. Measures in this vein include not just providing detailed information about schools themselves, but also about parents' chances of gaining places at different schools.

As indicated earlier in this review, arguably the most reliable information available on school quality is that which reports a school's value added. However, few parents make use of such data. That said, unadjusted school test scores do provide some indication of school quality, because they indicate a presence of high achieving peers (and therefore positive peer effects known to be beneficial for student achievement). Looking at school performance tables in England, however, Allen and Burgess (2011) find that leading performance measures used by parents to aid them in their school choices are not particularly comprehensible or relevant for choosing a school that maximizes a child's likely attainment. Allen and Burgess propose an alternative measure scoring more highly in terms of relevance and comprehensibility, but overall they also point to trade-offs between functionality and relevance and between comprehensibility and relevance in the use of school performance data.

Providing information to working class and disadvantaged parents has been shown to make a difference in terms of family school choice aspirations. Analysing data from a field experiment in the Charlotte Mecklenburg Public School district in North Carolina, Hastings et al. (2007) showed that provision of simplified information sheets to parents showing school test scores and the odds of gaining places at different schools led low income parents to choose schools with higher test scores,

ultimately focusing to a greater degree on school academic performance. Attending such schools (and in the Charlotte Mecklenburg district pupils had a non-zero chance of attending non-neighbourhood schools because places were allocated via a lottery, after neighbourhood pupils had been accommodated) was also shown to increase test scores for students (Hastings and Weinstein, 2008). As discussed earlier, empirical evidence such as this frequently (though not consistently) implies that school choice will most effectively increase academic achievement for disadvantaged students when parents have easy access to test score information and have good options to choose from.

There are limits to the types of information that it is possible to deliver in this way. School-based information is often limited in scope as "*it is factual, procedural information, aimed at managing the logistical problems created by choice*" (Archbald, 1988, p. 55). Printed, web-based, and other mass communications typical of school-based information can also be considered by families to be incomplete so more informal methods of dissemination (such as school visits) are also important. Further nuanced issues exist in arguments about providing school performance data relating to the dissemination, availability, and usability of information in the educational arena. There are issues of cost and incentive for schools to make it a point to communicate effectively with all potential choosers. "*Families unaware of [choice schools] are likely to be the most expensive to inform*" (Archbald, 1988, p. 224) and, as long as the choice school's enrolment meets the school's desired levels, there is little incentive – and heightened risk – in informing these families at all. For example, "*information equalizing awareness of [choice schools] could diminish [their] specialness by lowering barriers to access and increasing the proportion of applications from families less likely to support academic achievement and the [choice schools'] specialized programs*" (Archbald, 1988, p. 225).

School search websites

Recent developments in school choice information have included growing numbers of internet-based resources for parents designed to inform them and help them make decisions about schools. These sites have potential advantages over standard brochures because information can be personalised to meet the specific needs of the family. The increasing importance of school choice websites in educational marketplaces has been documented by authors such as Buckley and Schneider (2007) and Lubienski (2008) but also critiqued, because a clear 'digital divide' exists in which parents access (indeed are *able* to access) such websites and also because such websites typically include only simplistic information reporting unadjusted test scores for schools but not more sophisticated measures of school performance such as value added scores.

The best evaluated example of a school search website is 'Smart Choices', a website providing information to parents about schools in Hartford, Connecticut (described in Dougherty et al., 2010). It covers 200 schools and programmes in the city of Hartford plus 17 nearby suburban towns (in both English and Spanish). Parents enter their address and child's grade level and can specify preferences for schools in terms of distance from home, test scores and racial balance. The website aims to be a one-stop-shop by including links to all the school websites, transport information and application forms. The site reports two measures of school attainment: the 'test gain', which is a simple value added score for schools and raw test scores as the most common quality indicator in the state.

The site has been shown to be successful in changing the stated preferences of parents on application forms. One third of people who use the site change their top preference as a result and one third 'clarify' their choice. The third who change their minds do so on the basis of school test scores, test gains and racial balance. However, not surprisingly parents do continue to show a strong preference for distance, even after using the site.

The major downside to promoting choice via a site such as this is that the digital divide still clearly persists. It has proved necessary to engage in outreach efforts to overcome this digital divide and support certain parents in using the site.

Bespoke advice services

The most personalised forms of informational support hold the possibility of helping parents understand data that might otherwise be impossible to navigate. Choice Advisers in England were introduced in 2006 in order to provide targeted face-to-face and telephone advice about schools to less affluent parents, with the aim of 'empowering' them to better negotiate school admissions processes and aspire to higher performing schools for their children:

> 'Choice Advice will enable those parents who find it hardest to navigate the secondary school admissions system to make informed and realistic decisions about which schools to apply for in the best interests of their child. This will place these families on a level playing field with other families who are better able to navigate the admissions process'. (Department for Children, Schools and Families website, 2009)

In 2010, there were approximately 250 Choice Advisers operating in 150 local authorities across England via a range of different service delivery 'models'. Research by Stiell et al. (2008) evaluating Choice Advice in 15 English local authorities has shown the service to be valuable for parents. However, limits are also highlighted in terms of how far Choice Advice as a policy can ever promote 'fair admissions'. The labour intensive nature of personalised, targeted advice for

vulnerable parents means numbers of parents reached will only ever be modest. Furthermore, Coldron et al. (2009) have critiqued Choice Advice as being premised on a 'flawed characterization of the problem', labelling parents with lower incomes as 'deficient' without sufficiently acknowledging matters such as inequitable access to schools feeding into disadvantaged parents' rational ambivalence about choice.

Qualitative work on the Choice Advice service in England has also been carried out by Exley (2009; 2012b) showing how Choice Advisers have borne the brunt of contradictions within government policy. Advisers are overwhelmed by parental demand for their service, required to 'raise aspirations' at the same time as emphasising structural limits or 'realism' for parents, managing and containing expectations in a context of heavily restricted access to desirable schools.

Choice advisors in England were modelled on Parent Information Centers in the US, which were part of an initiative to encourage applications to 'magnet schools'. At their best, these centres have been described by Cookson (1994, p. 136) as '*community resources that bring schools and families together and act as benign brokers of educational choice*'. Centres such as these are an attempt to move beyond simple provision of written factual information for parents, countering middle class advantage by additionally helping less affluent parents navigate the system. As a policy, they stood alongside more conventional approaches such as the distribution of information and application forms directly to parents, printed brochures, transportation to school tour session, advertising in local media, and so on (Hall, 2009).

ii. Overcoming income constraints

Coldron et al. (2008) document the explicit means by which the social, economic and cultural capital of a family can be used to maximise chances of securing a place at a preferred school. They report that 8% of parents with children now at state maintained secondary schools admitted to coaching children for entrance tests; 5% reported ensuring their child was in the correct feeder primary school; 4% reported paying for extra tuition; 4% reported arranging extra-curricular activities; 3% reported moving or renting a house in the correct catchment area; 1% reported joining a church or place of worship; and 1% reported asking someone with influence in the process to recommend the child.

While it is clearly very difficult for government policy to intervene to compensate for many of these activities, there are two clear areas where income support could be given to low income families: private tuition for entrance tests and transport cost support.

Private tuition

In England, there remain 164 grammar schools (educating 4% of all pupils), many of which are located in wholly selective areas such as Kent, Lincolnshire, Buckinghamshire, Trafford and Calderdale. Furthermore, 4% of comprehensive schools offer at least 10% of their places to children who pass an aptitude or knowledge test (Allen et al., 2012b).

State-funded private tutoring, i.e. giving intensive tuition to individual pupils in short, regular sessions over a set time period, has been widely used in policy interventions across the world (see Chappell et al., 2010 and Torgerson et al., 2011, for reviews). They have largely been shown to be very effective, with the most successful schemes appearing to be those that help underperforming children catch up, rather than support low income children with high academic potential.

Support for school transport costs

Exercising a choice to attend a non-local school usually involves greater travel distances on routes that are not served by dedicated school transport, such as school buses. This clearly has substantial environmental and congestion implications, though it is possible that these are outweighed by the benefits to society of operating a choice system (Wilson et al., 2007).

Interventions to support school transportation in the US, Australia and NZ, either through bus provision or public transport subsides, have always focused on cost of travel to the child's nearest school and so are not facilitating choice. This is also true of UK initiatives such as the pilot yellow bus schemes (Steer Davies Gleave, 2003).

Past UK governments have recognised the need to address inequalities in school access. In 2006, alongside policies for Choice Advice in England, government sought to facilitate travel for working class children to schools beyond their neighbourhood schools (2005 White Paper and 2006 Education and Inspections Act). However, outside very urban areas where public transport is well-functioning, it is hard to devise policies to enable choice. Low income families are less likely to own a car and far less likely to use personal transport for daily home-to-school travel (Department for Transport, 2011). For those low income families who lack the means (the spare car) and the time (in parents' travel time) to make journeys in a personal car, interventions may be restricted to offering private taxi services or paying other families making the journey to take additional children in their car.

iii. Reforming school admissions policies

The current system of school allocation allows parents to express a preference for between three and six schools, but given constrained capacity (with all spare capacity located in unpopular schools) oversubscription criteria act as a rationing device, allocating pupils to schools. Current oversubscription criteria typically used

by schools include priority for younger siblings of pupils already at the school, proximity to home or catchment areas, adherence to a particular religion and performance in an academic test (see West et al., 2009). Neighbourhood schooling forces parents to choose a school by choosing a place of residence. This has the advantage that all the families will live near to the school, thus minimising school journeys, allowing collective progression of primary school friends and creating a sense of community. The disadvantage is that worse-off families are powerless to access high performing schools since it ties access to the school tightly to residence and therefore to house prices, implying income-segregated communities (although Allen et al., 2010, suggest the phenomenon of strategic house-moving between the ages of 5 and 10 may be overstated).

Although admissions policies are seen as critical to whether parental choice is possible, in a system with constrained capacity with most parents preferring academically successful schools, the reality is that it is impossible to satisfy all choices, with popular schools using their admissions policies to decide who is admitted. In this sense, at any given point in time the system is a zero sum game where every successful allocation of a place at a preferred school denies another parent their choice. Altering the admissions policies, for example to make greater use of lotteries or banding (taking equal numbers across the ability distribution) does nothing to facilitate greater parental satisfaction (unless it alters the long-run relative popularity of schools); admissions policies will simply alter the set of parents who are able to achieve their choice of school.

Critically though, school admission policy reforms can be more, or less, advantageous to low-income families. Schooling markets in England, as they are currently constructed, appear to have a tendency to become stratified where schools are able to control their own admissions. Schools are more segregated than neighbourhoods in almost all parts of England and Burgess et al. (2007) and Allen (2007) both show that this post-residential sorting is greatest in areas of higher population density and where there are larger proportions of autonomous schools. Allen and West (2011) confirm that autonomous schools such as faith voluntary-aided schools do have intakes that are more socially advantaged than their direct neighbourhoods. It is understandable that schools choose to construct admissions policies that favour more advantaged families and one goal of the pupil premium is to increase the incentives for attracting free school meals pupils to the school.

Reforms that are successful in supporting low income families in making choices are likely to simplify admissions overall, thus lowering informational barriers, and lowering reliance on family income or cultural capital. For example, reducing reliance on complex tests of religiosity, on specialist subject aptitude and location of family home could all be helpful, as could increased use of lotteries and banding. Allen et al. (2012b) showed that the tightening of the School Admission Code between 2002

and 2010 successfully lowered school stratification. However, reforms must be carefully introduced since, for example, school banding has been misused by schools to select by ability (West et al., 2009) and lotteries will not necessarily lower social stratification if they still maintain strict geographical residence requirements as happened in Brighton and Hove (Allen et al., 2012a).

e. Concluding remarks

The literature suggests that what parents look for in a school may vary by social class: middle classes tend to value performance and peer group; lower SES groups may look for accessibility, friendliness of staff and support for those of lower ability. This may lead lower SES groups to select themselves out of high performing schools to avoid possible rejection or failure. These social class differences in preferences for schools are not particularly open to policy intervention.

Disadvantaged families (by definition) have access to less in the way of resources, which can (a) limit the range of schools which they can consider due to transport costs, and (b) prevent them from accessing supplementary tuition. It is possible to offer financial support or provide services to overcome these deficits.

Finally, the middle classes tend to have access to higher quality information on schools and be more adept at using it. The publication of performance tables and Ofsted reports aims to level the playing field in this regard, but cannot compensate for 'soft' knowledge of local schools. More seriously, the complexity of the current system of school admissions makes it difficult to successfully state school preferences on the admissions form without the capacity to estimate chances of being allocate a place. Choice advice services aimed to help lower SES groups navigate our very complex system of admissions. A more straightforward policy solution would be to lower the informational constraints by simplifying school admissions and placing restrictions on permissible oversubscription criteria. For example, a combination of catchment areas and lotteries for 'choice' places provides clear and equal probabilities of the chances of success in the school choice process.

3. Analysis: Concepts, definitions and data

The literature review makes clear that not all families make choices about their children's schooling that might be considered optimal from a systemic point of view. It also sets out some of the ways in which these issues might be addressed or mitigated.

In this section we address the prior scoping question: what is the potential scale of the issue? How many children go to schools other than the one that we might consider to be their highest performing available school? And who are these children? What difference would it make to overall student attainment if they did go to the "best" school available to them? Below we undertake an analysis of school admissions to try and assess the likely answers to these questions. This is an exploratory analysis of the possible numbers involved. We also discuss the sensitivity of our results to some of the assumptions we are forced to make.

a. Modelling school choices

The basic empirical problem we face is trying to model the school choices that families make without data on the choices they stated on the LA applications forms[1]. Instead, the best we can do is to infer their preferences from the schools available to them, and the school which the child actual attends. We focus on the interpretation of the case of a child attending school A when school B is a better performing school and potentially available to that child. There are two possibilities: the child actually chose school B but was not offered a place and went instead to school A, or the child chose school A and was offered a place. We want to identify the latter instances and ignore the former. Necessarily, this is an approximation.

We can make some progress on this given: information on the admissions system across England and its permissible priority rules; knowledge of the important factors for the demand for school places; and data about the characteristics and location of the families and schools. For our purposes, the two key factors are proximity and capacity. We assume that the possibility that the pupil applied to the high performing school but was not admitted is ruled out if: it is near the pupil's home, and if it has spare capacity. The proximity rule is ubiquitous in school admissions arrangements and has a central influence on preferences and admissions, so we need to rule out the possibility that the family simply lived too far away from the school. Second, schools can refuse entry to students once they have hit their capacity, so we also need to focus on cases of schools with capacity.

Note that we also have no information on sibling relationships and therefore the admission route into schools that these provide. Nor does the NPD contain measures of the faith professed by a child and its family.

In summary, lacking data on the actual stated choices of parents, we use the National Pupil Database to help us approximately identify cases of students attending a particular school despite a higher-performing one being available.

[1] Such data is only held by LAs, and not known to DfE centrally.

b. Definitions

The key outcome variable at student level is: “does this student have a local school with at least N spare places which also has higher performance level than the current school?” We now define all these terms in detail. Again, we want to make explicit and clear the strong assumptions we need to make in order to be able to get any sense of scale of this phenomenon. Our view is that these assumptions mean our estimates are lower bounds on the truth.

Local: this is based on a standard sub-unit of Census Geography, the Lower Layer Super Output Area (LLSOA). These are very small units, containing on average about 1,500 residents (minimum of 1000) and about 15 – 20 students from a single year group. Our criterion is: if at least 2 pupils (across year groups) within an LLSOA attend a specific school, that school is deemed to be within the catchment area of all pupils in that LLSOA. That is to say, a pupil living in that LLSOA would be able to attend the school. It is worth re-emphasising that these are all approximations, and there will be cases where this criterion will not hold.

School performance level: We look separately at both gross output measures and value added measures. For the former analyses we use the school’s percentage of students achieving at least 5 GCSE grades at C or above, including English and Maths, abbreviated to %5A*C(EM), for secondary schools, and the school average key stage 2 score, KS2, for primary schools. For the separate value-added analyses we use DfE’s standard contextualised value-added score, CVA. We define “good schools” in local terms: having a higher mean outcome than the mean of the schools within a 3km radius of that school.

Spare places: While there is some information on the total capacity of the school, there is no reliable data for individual year groups, and in particular the entry year group (Reception, Year 1 and Year 7).

We create a minimum spare capacity measure which uses the difference (if negative) in [year group] pupil numbers between the current year (in this case 2009) and the previous year (2008): spare capacity = max((N(2008) – N(2009)), 0). Whilst this measure is by no means perfect, it provides us with a lower bound of spare capacity. Again, all we can do here is make an approximation, and it is easy to think of cases where it will give the wrong answer. For example, a school that is way below capacity but grows slightly will still have spare places in reality, but will be missed by this approximation. Given the lack of data available to us, it is important to be clear that there is really no way of estimating how much this might mis-estimate true constraints on choices.

Given this, we define primary schools as having spare capacity if there are at least 4 spare places, and secondary schools as having spare capacity if there are at least 10 spare places. For robustness, we check all our results using assumptions of 1, 2, 4, and 10 spare places. Of course, in some areas middle schools muddy this picture. There are no obvious quality measures available for such schools, so our only option was to remove these from the analysis (and the hypothetical reassignment simulations reported below do not include middle school pupils).

We tested the sensitivity of our results to the key assumptions here. First, on using the LLSOAs to identify catchment areas, two issues were highlighted. One potential problem is that all of the pupils in a particular LLSOA could possibly attend a single school, while still being potentially in the catchment area of another school. While this is clearly a possibility, in fact it is the case in less than 5% of LLSOAs that all the pupils living there attend the same school. Second, we chose 2 as the minimum number of pupils living in an area and attending a school as the threshold to identify that LLSOA as being in the catchment area of that school. This is clearly an arbitrary choice and other numbers would also be legitimate. The tables in Annex 1 show that different choices shift the figures in the obvious directions.

Looking first at primary schools: if we define a school as available if at least 1 student from that LLSOA attends the school then we find that 18,816 LLSOAs out of 31,865 we have data for have at least 5 schools available. This is the number in the first column penultimate row in the table below. If we require that at least 3 students have attended a school for it to count, then the number of LLSOAs with at least five schools falls to 408.

This is not at all surprising: LLSOAs are very small spatial units. We took as our measure that at least 2 students had to attend a school for it to count as available, as a reasonable compromise of these two factors.

We also looked at the sensitivity of our results to the definition of a “good” school. If we define a better school as “A good school with an available place and at least 20% of a standard deviation improvement[2] on the current school” then the results do not differ much. As we would expect there are fewer schools and students with these characteristics once we require a greater gap between the performance of the current school and the ‘target’ school. For example, in secondary schools the numbers in the final column of Table 1 (see Tables and figures) would be 6.4% (instead of 8.7%), 8.4% (13.8%), 9.7% (12.9%), and 10.8% (18.6%).

[2] These numbers are: 2.82pp KS2 scores, 3.5pp KS4 scores, 0.2 pri CVA, and 4 sec CVA.

c. Data

We use the National Pupil Database (NPD). This analysis uses pupil-level cross sections from 2008 and 2009. Our dataset includes standard personal characteristics, including gender, ethnicity, poverty status, full test histories, and school attended. Crucially we have pupils' home postcodes allowing us to better map the pupils' catchment areas. Some information is missing for some pupils, but in all cases we use the maximal dataset possible. We include the following school types: community, foundation, voluntary aided and voluntary controlled, and academies (for secondary schools). Grammar schools that are part of these groups are included. Special schools have been excluded. Because of difficulties matching infant to junior schools, we only consider all-through primary schools.

d. LA sample selection

We attempt to quantify the importance of the results by simulating a hypothetical re-assignment of students between schools. This only makes sense within a relatively restricted and closed system, so we do this for all the students and school places within an LA; and then repeat for a number of LAs.

We pick a set of LAs using the following criteria.

- Less than 10% of schools in the LA are middle schools, as these add complications but no new insight;
- The proportion of schools in the LA with the relevant number of spare places is at least 15% (to identify the results of re-assignment, we need some margin to actually re-assign some pupils)[3];
- At least 2 of the schools with spare places are "good", as defined above;
- For secondary schools, less than 10% of schools in the LA have missing result information. This is not applied to primary school samples as almost all LAs have a large selection of infant schools which do not have results. This largely derives from schools switching to academy status, and having no published results in the first year; this is also relevant for CVA regressions in areas with middle schools

These criteria produce 42 LAs for the main school analysis using the CVA measure; this includes 39 (primary school, KS2 measure); 18 (secondary school, CVA) and 10 (secondary school, GCSE 5A*C).

[3] This is also a modelling choice we had to make, though we doubt that varying this would make much difference at all to the results.

4. Results 1: Identifying pupils with better apparently-feasible choices

a. How many students have better apparently-feasible choices?

We start with a straightforward head-count of students satisfying our definition of having a higher-performing and apparently feasible choice available. Taking first the gross output measure as our definition of performance, Table 1 shows that overall this group accounts for about 9% of students: 8.7% in secondary schools and 9.8% in primary schools. While this equates to some tens of thousands of students, as a fraction of the total it does not seem that large. If we use instead the CVA measure of performance the fraction is some 50% higher: 13.8% in secondary schools and 12.7% in primaries. This makes sense; CVA is not widely used among parents, so school choice is less likely to be based on this and consequently more students may have a higher CVA school available.

The table also presents the same data for the sub-set of LAs that we focus on later to evaluate the size of the attainment loss. These are by definition places with higher numbers of students in this position. The numbers are indeed higher, but not dramatically so.

In Table 2 we identify the LAs with the highest fractions of pupils with higher-performing available choices. The fractions here are much higher, 23% - 38% for secondary schools, and 27% - 33% in primaries. The list of LAs does not suggest any obvious pattern – there is a mix of urban and rural, large and small, and varying levels of affluence.

Table 3 presents some simple descriptive statistics comparing the sub-set of LAs where there are higher fractions of these students with England as a whole. The picture is of little difference, but if anything the sub-set LAs have slightly lower levels of deprivation on average. It is not clear whether there are deeper-lying common factors among these LAs or this selection derives largely from random noise due to the necessity to approximate parents' school preferences due to lack of data. Such deeper-lying factors might be in the way that school choice is implemented or in the local geography and transport infrastructure, but this is only speculation.

In Table 4, we cut the data another way and look at schools. Focussing on the second column of data, we have just over 2700 secondary schools in our data. Of these, 378 have at least 10 spare places according to our estimate of capacity. And of those, 76 showed higher performance than the local average (as defined above),

less than 3% of the original total. Again the numbers are higher using the CVA measure of performance and the numbers are also higher for primary schools using 4 spare places as a criterion.

In summary, it is possible to identify students who are in particular schools despite there being higher-performing schools, apparently with places available. In terms of numbers there are tens of thousands of such pupils, but as a fraction of the total, they account for around 9%. Turning the question around, about 3% of secondary schools appear to have places available despite performing better than their local competitors. It is worth re-emphasising two things when interpreting these numbers. First, data problems: we have no data on parents' chosen schools so can only infer their preferences from their local context; and we have no data on true school capacity and so again have to rely on assumptions to estimate capacity. Second, there are obviously other factors involved in parents' choices of school and the fact that some are apparently not choosing the highest performing may simply be reflecting that those other factors are important too.

b. Describing the pupils with better and feasible choices

The individual level data in the NPD allows us to characterise the students with better and apparently feasible choices available. Table 5 simply provides average characteristics, before we report the results of a multivariate regression analysis below. Focussing again on the gross output measure of performance, it is clear that our focus students are less well-off and show lower prior attainment, reflecting the findings in the literature review above. For example, for secondary schools, 16.2% of FSM-eligible students fall under our definition compared to 8.8% of non-eligible students (these are unconditional figures; the tables control for other factors correlated with FSM eligibility such as IDACI, ethnicity and SEN).

We now undertake a more formal analysis[4]. Exploiting the individual data in the NPD, we run a linear probability model to quantify the individual factors associated with having better and apparently feasible choices available. The independent variable is a dummy indicating if the pupils have a better school available in their catchment area, which has spare capacity at the relevant level. We have defined these spare capacity levels to be four and ten for primary and secondary schools respectively. The regressions are run on all pupils in the relevant year groups of the LAs selected for each model, but where school result information is unavailable all pupils from that school are omitted. As explanatory variables we include: gender, ethnicity, FSM-status, IDACI, EAL-status, SEN-status, prior attainment (for year 7

[4] These are OLS regressions on the variables indicated in the Table and footnotes, with fixed effects at the level of the LA, and standard errors clustered at LA level.

pupils), and LA fixed effects. Standard errors are clustered at LA level in all regressions. In Table 6 we look at students entering primary school and in Table 7 those just entering secondary school. For each, we offer four variants:

- Gross output measure (GCSE or KS2), all students in England
- Gross output measure (GCSE or KS2), students in selected LAs
- CVA measure, all students in England
- CVA measure, students in selected LAs

There are a number of common patterns across all four panels of Table 6. Both individual (FSM) and neighbourhood (IDACI) deprivation are highly correlated with the availability of places in higher-performing schools. In Table 6A, the magnitude of the IDACI coefficient suggests that a 10 percentage point (ppt) increase in the IDACI score (about half a standard deviation) is associated with a 1.4 ppt increase in the probability of having a better school available. Relative to an overall probability for the dependent variable of around 9%, this is a very high impact. The coefficient on FSM is also very substantial, implying that FSM-eligible children have a higher probability of having a local higher-performing school with available slots of around 3 ppt, almost 40% higher than FSM non-eligible students.

In terms of the other characteristics, Asian ethnicity is often but not always negatively associated, Black ethnicity varies in sign, and being female is usually negatively associated with the availability of places in higher-performing schools. SEN-status is typically positively linked and EAL-status varies in sign and significance.

It is clear that the inclusion in the regression of the IDACI measure results in a lower coefficient on the FSM measure. In some cases, panels C and D, this pushes FSM into insignificance. It is unclear whether this is simply due to the very high statistical correlation between individual and neighbourhood deprivation, or whether it is really due to the latter being more important than the former. The fact that the insignificance arises in much smaller (though not small) samples suggest that it may simply be a multicollinearity issue.

There is a very similar pattern in Table 7 for secondary schools. Again, individual and neighbourhood deprivation are strongly associated with the dependent variable. The proportional increase in the probability of the availability of places in higher-performing schools for FSM-eligible students is high: for example, in Panel A, column 6, it is 3.3 ppt higher, relative to an overall probability of 10% in this sample. The impact of IDACI is also somewhat higher in secondary schools.

In general, the magnitudes of the coefficients are bigger in the secondary school regressions for both IDACI and FSM-status, implying that disadvantaged families are more likely to have ignored available places in higher-performing schools at the

secondary level relative to primary. This may simply be due to the greater number of primary schools relative to secondary schools. Alternatively, it could be that primary schools are seen as more homogenous than secondary schools and as such parents are less concerned about quality measures.

The role of prior attainment (KS2 score) fits in with this. Low prior attainment is associated with a higher probability of the availability of places in higher-performing schools. Given that admissions cannot be directly related to KS2 scores and should generally be independent of ability altogether, it seems likely that the KS2 coefficients are mainly picking up differences in parental background.

The role of the other individual characteristics follows the same pattern as in primary schools. Asian ethnicity is often associated negatively with the dependent variable, as is being female; Black ethnicity has either no effect or a positive effect. EAL status is usually insignificant and SEN status typically positive.

It should be noted that as is typical in this sort of dataset, the fraction of the variation explained in the model, the R^2, is low.

In summary, while the overall percentage of students with a local higher-performing school with available slots is relatively low at around 9%, it is much higher for disadvantaged students. Students who are FSM-eligible and live in deprived neighbourhoods are more likely to be identified as not attending an available higher-performing school; Asian students less likely and Black students more likely to meet this definition.

5. Results 2: Implications of these choices

In this section we examine the implications of the choices we analysed above. To do this, we consider a hypothetical situation in which we attribute different school choices to the students we have identified above as being in a particular school despite there apparently being places available at higher-performing schools. We then mimic the operation of the school admissions algorithm and assign the students to schools. Obviously, with different preferences, the school assignments are different, and in principle so are the test scores.

We evaluate the impact on student attainment from these hypothetical reassignments. The details of the algorithm by which we carry out this process are set out below. Again, clearly a number of assumptions are made to do this, and the results are as ever only as strong as the assumptions. We believe that the results are interesting, but are clearly taking our data a long way, and need to be interpreted very cautiously.

a. Modelling Decisions

There are two key empirical decisions we have to make: which students would go to which schools? And what GCSE score would they get there?[5] We do this in a way that tries to respect most of the real world features that govern school allocation. The algorithm respects school size: we don't 'magically' create more spaces at the good schools. It uses the actual admissions mechanism that is in operation across the country (that is, an 'equal preferences' mechanism). And we take account of the key role of proximity in school admissions – we include in each student's choice set only those schools to which that student's neighbours have gained admission.

We rely on the simpler procedure considered by Allen and Burgess (2011) to estimate the counter-factual score that a student would get in a school other than the one actually attended. We do not take any account of other things that might change consequent upon a changed student demographic composition – the role of peer effects, and indirect peer effects through teacher and other resource changes.

The data design is as follows:

1. We generate an individual catchment zone for each student. This is derived as follows: they are generated based on their LLSOA having at least 2 pupils attend a given school; in addition their own actually-attended school is in their personal catchment zone.
2. A school is considered "good" if it scores at least as high as the mean performance score in the catchment area of the LLSOA. As above, we use different performance metrics: the school percentage scoring at least 5 A*-C (EM), the school mean KS2 score and CVA.
3. The dataset is shaped so that all schools in the catchment area and the student's own school are in the dataset.
4. The admissions algorithm works with pupil preferences for schools and school priorities for pupils. We do not have these in the data, so we need to generate them.
5. Pupil preferences are randomly generated (using a uniform distribution) for all good schools and given values between 1 (highest preference) and just above zero. Preferences for non-good schools are set to zero.

[5] We decided to model the GCSE points score rather than the likelihood of getting at least 5A*-C grades as modelling the continuous variable (point score) gives more information than a dichotomous variable.

6. Pupil priorities are also randomly generated for within-catchment area pupils. This is then over-written and set to 1 for the actually-attended school, so anyone in a good school can always go there if they wish.

Admissions Algorithm

1. Nominations are based on pupil preferences
    a. Pupils' nominated schools are accepted according to pupil priorities
    b. Pupils who attended a good school already always reapply

2. Once pupils are accepted to a good school, they always reapply to it unless displaced in which case they apply to their next highest preference

3. The algorithm continues until a stable matching is found.

This procedure is carried out simultaneously for all catchment areas across the entire LA. Students living near the borders of an LA are allowed to apply to schools in neighbouring LAs. A separate randomisation and reassignment is carried out for each specification (ie: primary CVA; primary KS2). The entire procedure is repeated for each LA in the sub-set determined above.

To predict the test score that a student would get at another school we estimate pupil level fixed effect regressions on GCSE point scores. We adopt a very standard model: we regress GCSE points score on pupil characteristics and school fixed effects for year 11 pupils for the years 2006 – 2009. We extract the estimated school effect for each school. We use the estimated coefficients on pupil characteristics along with the school effects to form a predicted outcome for each pupil in both the assigned and the attended school.

b. Results

It is worth re-emphasising that in interpreting the results, these are thought experiments based on a number of strong assumptions; they are not predictions. As we have noted, they are unlikely to represent a new steady state and many other things are likely to change too. We believe that they do indicate a broad order of magnitude of the likely impact of different preferences. We have indicated the sensitivity of the results to the key modelling assumptions above.

In Table 8 we give a simple overview of the re-assignments for secondary school (panel A) and primary (panel B), categorising by quintile of school performance. The top part of panel A shows the results of using gross output, the %5A*-C(EM), as the performance measure for the reassignment. Of the identified students attending schools in the lowest quintile, a small number are re-assigned to better schools within that quintile. A lot more are reassigned to schools in the second or third

quintile, and some higher. Schools of considerably different academic performance can be found quite close together so it is possible that large gains in attainment can be recorded.

In the lower part of Panel A, we use CVA as the performance measure for reassignment. As we showed earlier, this identifies a lot more students apparently in lower-performing schools, because CVA is not widely used (or known) for forming preferences. This therefore leads to a lot more re-assignments too. It also leads to some apparent losses – students being re-assigned to lower performing quintiles as defined by the %5A* - C(EM), because this and CVA are not perfectly correlated.

Turning to primary schools in Panel B, we see a similar pattern. The most common reassignment is one or two quintiles higher – so a substantive gain.

We consider this in much more detail in Table 9. As before, this has four panels: secondary and primary schools, gross output and CVA measures of performance. Panel A relates to secondary schools, with re-assignments using %5A*-C(EM) as the performance measure. As noted above, the procedure was run separately for each LA; the results are presented here ranked by LA average score gain for all the LAs in our sub-set.

The table shows some LAs with sizeable gains: 19.4 points in Surrey is a gain of 6% of the starting value; 8.5 points for Durham is 3%. These are gains of 19.2% and 8.3% of a pupil-level standard deviation (SD) of GCSE points score, so not trivial. An alternative metric is grades: 6 points is a difference of one grade in one GCSE, so 19.4 points means one grade higher in 3 – 4 GCSEs. These gains will go disproportionately to FSM-eligible students (as they are more likely to be re-assigned) so this will reduce the attainment gap to a degree. This is illustrated below in Figure 1. In the second panel, there are more reassignments using the CVA basis (as we have seen above), and the range of gains is comparable to the first.

The third and fourth panels of the table focus on primary schools. More LAs fit the criteria for inclusion in the analysis, and the gains are more substantial. The scores are presented as normalised KS2 scores so are in SD units. There are a number of LAs with mean gains over 20% of an SD.

In Figure 1 we provide a graphical representation of these results. Again, the different panels relate to different cases. Panels A – D are secondary schools, and E – F for primaries; A and B report the results of using %5A*-C(EM) as the reassignment performance measure for two different outcomes plotted, GCSE grades (A) and GCSE points (B); C and D plot the same outcome measures using CVA as the reassignment performance measure. Panels E and F plot normalised

KS2 scores using first KS2 and then CVA as the reassignment performance measure.

Each figure is constructed as follows from the individual student-level predicted gains. We took the GCSE gains and ranked students from the lowest to the biggest gains (negative (ie losses) at the lower end, and substantially positive at the top). This is the horizontal axis, the lowest ranked student at x=1 at the left and the student with the highest gain at the right. The line then simply plots the gain for each student.

There are a few common patterns in all the panels. The gradient for FSM-eligible pupils appears to be steeper indicating bigger gains for these pupils. At the upper end of the rankings they appear to mirror each other, with a few pupils in both groups making very large gains.

Focussing on panel C, the FSM group passes the zero gain point at the 300th pupil (out of 1101 obs); the top 50% gain at least 2 grades and the top 25% gain at least 4 grades. The non-FSM group passes the zero gain point at the 2936th pupil (out of 9583) with the top 50% gaining at least 1.4 grades and the top 25% gaining at least 3.8. Overall, the mean gain for FSM-eligible students is 2 grades, and the mean gain for non-FSM students is 1.6 grades. This supports the claim that this hypothetical reassignment strategy decreases the attainment gap. A very similar pattern is seen in the panels for primary school students. Again the line for FSM-eligible students is steeper, and the majority of students see a positive change. For FSM-eligible students, about half receive estimated gains of over 0.25 standard deviations of a normalised KS2 score, and not small numbers receive gains over 0.75 SDs.

Turning attention to the impact on schools as opposed to individual students, one goal of this analysis was to quantify the impact of these identified choices on the admissions of under-performing schools; that is, to see if these identified choices were an important part of helping these low-performing schools survive. But this is actually very difficult to isolate. Our hypothetical reassignment respected existing school sizes, so not all students who wanted to could gain a place at a high-performing school as we did not allow those schools to expand. Consequently, those students had to be found a place somewhere and using the Equal Preferences algorithm, some students had to be placed in the low-performing schools. In other words, the scope for pupil numbers to fall at low performing schools is limited by the scope for numbers at other schools to rise.

6. Conclusions

a. Summary of Evidence Review

The evidence suggests that what parents look for in a school may vary by social class: middle classes tend to value performance and peer group; lower SES groups may look for accessibility, friendliness of staff and support for those of lower ability. This may lead lower SES groups to select themselves out of high performing schools to avoid possible rejection or failure.

Disadvantaged families (by definition) have access to less in the way of resources, which may limit the range of schools which they can consider due to transport costs. More affluent families tend to have access to higher quality information on schools and be more adept at using it. The publication of performance tables and Ofsted reports aims to level the playing field in this regard, but cannot generate informal knowledge of local schools.

b. Summary of our Data Analysis

This report explores the choices made by parents in relation to school performance. Our focus is on the potential for more children from disadvantaged families to attend high-performing schools. We estimate the choices made by families relative to our estimate of their feasible choice sets. Specifically, we consider how many students could potentially have attended a higher performing school with spaces available.

We use the NPD to address the following question for each student: “does this student have a local school with spare places which also has higher performance level than the current school?” We define all these terms in detail. Breaking this overall question down into simple, specific, quantitative questions based on a number of necessary modelling assumptions allows us to:

- quantify how many students appear to be in this category, and how many schools are high-performing but not full;
- identify the typical characteristics of the students we identify;
- carry out a counter-factual analysis: we hypothetically re-assign students to different schools in a way that takes more account of school performance and quantify the gain in mean attainment.

Lack of data forces us to make a number of strong modelling assumptions. Based on these, we are able to establish the broad order of magnitude of the number of students who are in particular schools despite there being local higher-performing schools, apparently with places available. We believe that between 5% and 10% of secondary school students fall into this category. Turning the question around, about 3% of secondary schools appear to have places available despite performing better than their local competitors. We reiterate that these numbers are estimates, based on a set of strong assumptions, because there is no data available on the actual choices parents make, and only poor data on school capacity.

While the average percentage of such students in secondary schools is around 9%, it is higher for disadvantaged students. Students who are FSM-eligible and live in deprived neighbourhoods are much more likely to be attending a school despite there being a local higher-performing school apparently with spare places. Asian students are less likely to meet this definition and Black students more likely.

Having identified such students, the second question is how much difference would it make to hypothetically re-assign them to other schools. Needless to say, this necessarily involves more modelling assumptions. In order to keep a degree of realism, we respect the apparent capacities of schools and do not assign students to schools beyond the numbers that they currently take. This is therefore necessarily strongly dependent on our assumptions on capacity.

We simulate such an assignment many times and average over the outcomes to evaluate the likely impact on attainment if these parents had chosen different schools. This relies on our estimates of the impact of schools on pupil attainment, which derive from fixed effect regressions and which we cannot consider to be truly causal. Bearing all these caveats in mind, our results show non-trivial gains for some groups in some places: there are some LAs with average gains of between 10% and 20% of a pupil-level standard deviation of GCSE points score, a substantial number.

Once we split the gains up by FSM-status, we see stronger gains on average for FSM-eligible students. Overall, the mean gain for FSM-eligible students is around 2 GCSE grades per student, and the mean gain for non-FSM students is 1.6 grades. This supports the claim that this hypothetical reassignment strategy decreases the socio-economic attainment gap.

c. Proposals

Can we say that (somehow) encouraging disadvantaged families to place greater weight on school performance when making school choices would be likely to increase overall attainment, and reduce the attainment gap?

Certainly not on the basis of this study alone. It is not at all clear that disadvantaged families have very different school choice preferences from more affluent families. This study has much more modest ambitions: to produce an estimate of the orders of magnitude involved and a general sense of the potential gain in test scores. It is worth re-emphasising two limitations when interpreting these numbers. First, data problems: we have no data on parents' chosen schools so can only infer their preferences from their local context; and we have no data on true school capacity and so again have to rely on assumptions to estimate capacity. Second, there are obviously other factors involved in parents' choices of school and the fact that some are apparently not choosing the highest performing may simply be reflecting that those other factors are important too.

Our literature review makes clear that for some families resource constraints may limit choices, while for others, better/more suitable information may influence their choices. For these families relevant support may make a significant difference. But it also suggests that some families value schools for reasons other than performance, and some may even deliberately select themselves out of high-performing schools to avoid failure. Policy intervention here is both practically and morally complex.

Finally, we re-state our view that while this group of students (attending a low-performing school because they chose it) is certainly of interest, another group (attending a low performing school because they could not get in to a higher-performing one) is more numerous and plays a greater role in explaining the attainment gap, and that the proximity rule for school admissions is a big part of that (Burgess et al., 2009).

Throughout this report we have emphasized the strong assumptions we have had to make to characterize this phenomenon. This problem arises from lack of data on parental preferences and school capacity. Such data could be obtained (indeed our original proposal was to do so), and we would recommend doing so if there is a desire to follow this study up in any way. Given the approximations required to produce the numbers we have, we believe it would be foolhardy to base any policy proposals solely on these.

If it were then shown to be the case that significant numbers of parents were making decisions for their children to attend schools other than the highest performing, then it might be appropriate to consider some of the policies discussed in the Evidence Review section.

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Tables and Figures

Table 1 Students attending a school despite the local presence of a higher performing school with spare capacity

Secondary schools			
	Total number of pupils	With a higher performing school available with spare capacity	
		Number	%
England			
School performance measure:			
%5A*-C(EM)	505,917	44,025	8.70
CVA	505,917	69,984	13.83
Subsample			
%5A*-C(EM)	68,683	8,725	12.89
CVA	119,995[1]	22,310	18.59
Primary schools			
England			
Mean KS2 score	813,320	79,942	9.83
CVA	567,192	72,287	12.74
Subsample			
Mean KS2 score	317,216	35,588	11.22
CVA	225,118[2]	36,116	16.04

Note: capacity is taken to be at least 10 spare places at secondary and 4 at primary school.

1. These two numbers (68,683 and 119,995) are different because we use different samples due to the fact different LAs have different levels of missingness across the 2 specification (results information). Also more LAs met the criteria of "at least 2 good schools with spare capacity" we used when choosing our LAs.

2. The CVA subsample had around 100,000 observations with no CVA information.

3. Totals differ between this and table 3 as there is different information required. Table 3 has cases where we have no results information for the individual.

Table 2 Local Authorities with highest fractions of such students

Local Authority	Percentage with a higher performing school available with spare capacity
Secondary Schools	
Stockton-on-Tees	38.5
North Lincolnshire	30.8
Wirral	27.2
Durham	25.0
Wakefield	23.5
Primary Schools	
Liverpool	32.8
Dudley	29.6
Cornwall	28.4
North Yorkshire	28.0
York	26.8

Note: capacity is taken to be at least 10 spare places at secondary and 4 at primary school. Performance measure used in %5A*-C(EM) and KS2

Table 3 Descriptive statistics for key variables

Mean (Standard Deviation)

	Primary Schools			Secondary Schools		
	England	**Analysis sub-samples**		**England**	**Analysis sub-samples**	
		CVA Sample	KS2 Sample		CVA Sample	% 5A*-C(EM) Sample
% Eligible for Free School Meals	17.6 (38.1)	13.8 (34.5)	14.7 (35.4)	16.8 (37.4)	11.8 (32.2)	13.5 (34.1)
Mean IDACI score	25.4 (19.8)	20.1 (17.3)	21.2 (21.2)	23.3 (18.7)	17.3 (14.3)	19.0 (16.2)
Bottom Quartile of KS2	-	-	-	26.0 (43.9)	25.0 (43.3)	25.4 (43.5)
Top Quartile of KS2	-	-	-	23.6 (42.5)	25.1 (43.4)	24.1 (42.8)
N	756,998	222,661	277,227	511,062	119,966	67,679

1. Totals differ between this and table 1 as there is different information required. Table 3 has cases where we have no results information for the individual.

Table 4 Schools, spare capacity and performance

	Year 1	Year 7
Performance measure is KS score	**KS2**	**KS4**
Schools with this year group	12222	2767
And above local KS	5871	971
No. with at least 1 spare place	3646	1014
And above local KS	1647	322
No. With at least 4 spare places	1769	648
And above local KS	725	163
No. With at least 10 spare places	403	378
And above local KS	167	76
Performance measure is CVA		
Schools with this year group	9186	2768
And above local CVA	4692	1452
No. with at least 1 spare place	2755	1014
And above local CVA	1407	512
No. With at least 4 spare places	1317	648
And above local CVA	639	307
No. With at least 10 spare places	291	378
And above local CVA	141	161

Local average means the average of schools in a 3km radius of the school.
KS2 Performance is the percentage achieving level 4

Table 5 Characteristics of pupils not attending best local schoolPercentage of pupils not attending the best local school when it has 10+ places available: (Primary schools only require 4+ places)

	Year 1 / R		Year 7				
Performance measure:	**FSM Eligible?**		**FSM eligible?**		**KS2 Group**		
	No	Yes	No	Yes	Low	Mid	Top
KS2/GCSE Score	11.0	16.1	11.5	22.0	15.7	13.0	9.5
CVA	15.6	19.1	17.7	25.1	19.8	18.7	17.0

All pupils in the regression subsamples are in the table.
This includes pupils who attend a 'good' school but have a better one with 10(4 for primary) spaces available.

Table 6 Panels A-D: Student characteristics associated with having a better primary school choice available: Panel A: All LAs, Performance measure is KS2

Outcome is binary, is there a better school with space in my catchment;
all LAs;
spare places = 4+;
performance measure = KS2

	Reception:	Yr1:	Pooled	Reception	Yr1:	Pooled
FSM eligible	0.0126***	0.0130***	0.0128***	0.0281***	0.0296***	0.0289***
	(0.00214)	(0.00206)	(0.00159)	(0.00331)	(0.00339)	(0.00235)
IDACI score	0.127***	0.141***	0.134***			
	(0.0174)	(0.0171)	(0.0113)			
Asian ethnicity	0.00917	-0.00884	-0.000779	0.0149**	-0.00164	0.00564
	(0.00617)	(0.00546)	(0.00440)	(0.00691)	(0.00538)	(0.00476)
Black ethnicity	0.00219	-0.000180	0.00110	0.0127**	0.0119**	0.0124***
	(0.00566)	(0.00568)	(0.00459)	(0.00562)	(0.00543)	(0.00440)
Female	-0.00234**	-0.000117	-0.00106	-0.00193*	0.000429	-0.000595
	(0.00101)	(0.000939)	(0.000716)	(0.00101)	(0.000938)	(0.000711)
EAL	0.00119	0.00303	0.00215	0.00773**	0.0105***	0.00926***
	(0.00347)	(0.00326)	(0.00275)	(0.00384)	(0.00352)	(0.00304)
SEN	0.00989***	0.00937***	0.0104***	0.0151***	0.0147***	0.0154***
	(0.00266)	(0.00226)	(0.00188)	(0.00282)	(0.00259)	(0.00202)
N	356531	417914	774445	357972	419784	777756
R^2	0.040	0.040	0.031	0.036	0.035	0.026

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
All regressions contain LA level fixed effects

Table 6 Panels A-D: Student characteristics associated with having a better primary school choice available: Panel B: Select LAs, Performance measure is KS2

Outcome is binary, is there a better school with space in my catchment
Select LAS
Spare places = 4+
Performance measure = KS2

	Reception:	Yr1:	Pooled	Reception	Yr1:	Pooled
FSM eligible	0.0227***	0.0132***	0.0176***	0.0423***	0.0308***	0.0361***
	(0.00401)	(0.00408)	(0.00306)	(0.00545)	(0.00746)	(0.00435)
IDACI score	0.142***	0.133***	0.138***			
	(0.0226)	(0.0369)	(0.0197)			
Asian ethnicity	-0.0153	-0.00784	-0.0102	-0.0115	-0.00436	-0.00661
	(0.0153)	(0.0193)	(0.0132)	(0.0159)	(0.0201)	(0.0142)
Black ethnicity	-0.00640	-0.0219***	-0.0136**	-0.000862	-0.0170**	-0.00847
	(0.0120)	(0.00690)	(0.00656)	(0.0117)	(0.00801)	(0.00705)
Female	-0.0192**	0.00571	-0.00603	-0.00430	0.0191*	0.00807
	-0.00148	-0.00168	-0.00160	-0.00106	-0.00115	-0.00113
EAL	(0.00199)	(0.00176)	(0.00135)	(0.00199)	(0.00176)	(0.00135)
	0.00795	0.0153**	0.0110*	0.0171*	0.0240***	0.0200***
SEN	(0.00922)	(0.00625)	(0.00594)	(0.00951)	(0.00748)	(0.00655)
N	133211	156453	289664	133699	157103	290802
R^2	0.029	0.024	0.023	0.024	0.020	0.018

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
All regressions contain LA level fixed effects

Table 6 Panels A-D: Student characteristics associated with having a better primary school choice available: Panel C: All LAs, Performance measure is CVA

Outcome is binary, is there a better school with space in my catchment
All LAS
Spare places = 4+
Performance measure = CVA

	Reception	Yr1:	Pooled	Reception	Yr1:	Pooled
FSM eligible	0.00374**	-0.000116	0.00186	0.0130***	0.0113***	0.0123***
	(0.00186)	(0.00172)	(0.00137)	(0.00326)	(0.00317)	(0.00257)
IDACI score	0.0759***	0.0962***	0.0866***			
	(0.0184)	(0.0194)	(0.0149)			
Asian ethnicity	-0.00292	0.00205	-0.0000436	0.000545	0.00692	0.00409
	(0.00611)	(0.00516)	(0.00468)	(0.00594)	(0.00513)	(0.00459)
Black ethnicity	0.00807	0.00989*	0.00903*	0.0143**	0.0179***	0.0162***
	(0.00578)	(0.00569)	(0.00470)	(0.00596)	(0.00574)	(0.00471)
Female	0.00125	0.00137	0.00139*	0.00148*	0.00170*	0.00165**
	(0.000867)	(0.000978)	(0.000742)	(0.000875)	(0.00101)	(0.000763)
EAL	-0.00435	0.0000730	-0.00197	-0.000415	0.00523*	0.00264
	(0.00347)	(0.00285)	(0.00248)	(0.00353)	(0.00292)	(0.00247)
SEN	0.000641	0.00114	0.00123	0.00374	0.00470**	0.00444**
	(0.00213)	(0.00206)	(0.00189)	(0.00226)	(0.00235)	(0.00210)
N	356531	417914	774445	357972	419784	777756
R^2	0.044	0.036	0.031	0.042	0.033	0.028

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$ All regressions contain LA level fixed effects

Table 6 Panels A-D: Student characteristics associated with having a better primary school choice available: Panel D: Select LAs, Performance measure is CVA

Outcome is binary, is there a better school with space in my catchment
Select LAS
Spare places = 4+
Performance measure = CVA

	Reception	Yr1:	Pooled	Reception	Yr1:	Pooled
FSM eligible	0.00409	-0.00101	0.00119	0.0170**	0.0110	0.0138**
	(0.00324)	(0.00327)	(0.00265)	(0.00661)	(0.00753)	(0.00571)
IDACI score	0.0929**	0.0892**	0.0921***			
	(0.0372)	(0.0407)	(0.0301)			
Asian ethnicity	-0.00382	0.00268	-0.000216	-0.000469	0.00559	0.00293
	(0.0110)	(0.0108)	(0.00847)	(0.0110)	(0.0111)	(0.00871)
Black ethnicity	-0.0284***	0.00623	-0.0115	-0.0186**	0.0147	-0.00219
	(0.00994)	(0.0104)	(0.00765)	(0.00911)	(0.00926)	(0.00645)
Female	0.00131	0.000936	0.00100	0.00158	0.00119	0.00126
	(0.00135)	(0.00194)	(0.00146)	(0.00140)	(0.00205)	(0.00154)
EAL	-0.0141*	0.00169	-0.00598	-0.00838	0.00743	-0.000156
	(0.00799)	(0.00681)	(0.00563)	(0.00789)	(0.00723)	(0.00549)
SEN	-0.00191	0.00556	0.00104	0.00205	0.00890*	0.00455
	(0.00333)	(0.00375)	(0.00369)	(0.00340)	(0.00466)	(0.00429)
N	136804	161268	298072	137289	161927	299216
R^2	0.034	0.020	0.022	0.032	0.019	0.020

Standard errors in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; All regressions contain LA level fixed effects; *Main difference is Black indicator

Table 7 Panels A-D: Student characteristics associated with having a better secondary school choice available: Panel A: All LAs, Performance measure is %5A* - C(EM)

Outcome is binary, is there a better school with space in my catchment; All LAs; Spare places = 2+, 4+, 10+; Performance measure = %5A* - C(EM)

	2 Spare	4 Spare	10 Spare	2 Spare	4 Spare	10 Spare
FSM Eligible	0.0275***	0.0233***	0.0158***	0.0455***	0.0440***	0.0326***
	(0.00324)	(0.00274)	(0.00236)	(0.00497)	(0.00404)	(0.00372)
IDACI score	0.165***	0.188***	0.153***			
	(0.0299)	(0.0214)	(0.0184)			
Low KS2 score	0.0184***	0.0154***	0.0109***	0.0226***	0.0202***	0.0148***
	(0.00292)	(0.00254)	(0.00174)	(0.00310)	(0.00271)	(0.00193)
High KS2 score	-0.0463***	-0.0313***	-0.0186***	-0.0518***	-0.0376***	-0.0236***
	(0.00724)	(0.00594)	(0.00443)	(0.00714)	(0.00593)	(0.00446)
SEN	0.0102***	0.00786***	0.00459**	0.0126***	0.0107***	0.00685***
	(0.00316)	(0.00258)	(0.00199)	(0.00329)	(0.00269)	(0.00208)
Female	-0.0125***	-0.00894***	-0.00482***	-0.0119***	-0.00829***	-0.00422**
	(0.00284)	(0.00236)	(0.00179)	(0.00285)	(0.00235)	(0.00179)
EAL	0.00788	0.00308	0.000791	0.0149*	0.0111*	0.00718
	(0.00837)	(0.00667)	(0.00488)	(0.00819)	(0.00646)	(0.00466)
Asian	-0.0249***	-0.0217**	-0.0184***	-0.0175*	-0.0134	-0.0116*
	(0.00954)	(0.00873)	(0.00695)	(0.00999)	(0.00904)	(0.00677)
Black	-0.000560	0.00331	-0.00746	0.0128	0.0183**	0.00475
	(0.00842)	(0.00817)	(0.00596)	(0.00884)	(0.00856)	(0.00598)
N	491550	491550	491550	492761	492761	492761
R^2	0.088	0.087	0.092	0.085	0.081	0.085

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
All regressions contain LA level fixed effects. Standard errors are clustered at the LA level

Table 7 Panels A-D: Student characteristics associated with having a better secondary school choice available: Panel B: Select LAs, Performance measure is %5A* - C(EM)

Outcome is binary, is there a better school with space in my catchment; Select LAs; Spare places = 2+, 4+, 10+; Performance measure = %5A* - C(EM)

	2 Spare	4 Spare	10 Spare	2 Spare	4 Spare	10 Spare
FSM Eligible	0.0352***	0.0242***	0.0227**	0.0623***	0.0564***	0.0550***
	(0.00624)	(0.00650)	(0.00775)	(0.00988)	(0.00981)	(0.0130)
IDACI score	0.229***	0.273***	0.273***			
	(0.0637)	(0.0629)	(0.0608)			
Low KS2 score	0.0186**	0.0134*	0.00690	0.0248***	0.0207**	0.0142**
	(0.00621)	(0.00715)	(0.00491)	(0.00733)	(0.00801)	(0.00619)
High KS2 score	-0.0472**	-0.0310*	-0.0225*	-0.0544**	-0.0396**	-0.0311**
	(0.0169)	(0.0140)	(0.0112)	(0.0169)	(0.0143)	(0.0122)
SEN	0.0158	0.0160**	0.0135**	0.0205	0.0217***	0.0191**
	(0.0121)	(0.00556)	(0.00589)	(0.0123)	(0.00579)	(0.00622)
Female	-0.0131**	-0.00145	0.000784	-0.0119*	-0.0000780	0.00214
	(0.00563)	(0.00378)	(0.00411)	(0.00586)	(0.00343)	(0.00388)
EAL	-0.0158	-0.0251	0.0158**	-0.00619	-0.0136	0.0278***
	(0.0230)	(0.0310)	(0.00673)	(0.0252)	(0.0345)	(0.00802)
Asian	-0.00200	0.00832	-0.0418	0.0249	0.0403	-0.0100
	(0.0226)	(0.0226)	(0.0422)	(0.0259)	(0.0260)	(0.0412)
Black	0.0141	0.0317	0.0155	0.0319	0.0528*	0.0364*
	(0.0340)	(0.0249)	(0.0186)	(0.0351)	(0.0259)	(0.0185)
N	64805	64805	64805	64916	64916	64916
R^2	0.104	0.107	0.131	0.099	0.098	0.118

Standard errors in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; All regressions contain LA level fixed effects. Standard errors are clustered at the LA level

Table 7 Panels A-D: Student characteristics associated with having a better secondary school choice available: Panel C: All LAs, Performance measure is CVA

Outcome is binary, is there a better school with space in my catchment; All LAs; Spare places = 2+, 4+, 10+; Performance measure = CVA

YR7: Outcome is binary, is there a better school (CVA) in my catchment with N Spare places

	2 Spare	4 Spare	10 Spare	2 Spare	4 Spare	10 Spare
FSM Eligible	-0.00994***	-0.00595**	-0.00138	0.0129**	0.0184***	0.0197***
	(0.00340)	(0.00281)	(0.00230)	(0.00507)	(0.00406)	(0.00366)
IDACI score	0.208***	0.221***	0.191***			
	(0.0298)	(0.0249)	(0.0213)			
Low KS2 score	-0.00463*	-0.00151	0.00150	0.000814	0.00427*	0.00648***
	(0.00269)	(0.00233)	(0.00194)	(0.00277)	(0.00239)	(0.00204)
High KS2 score	-0.0119***	-0.00824***	-0.00663**	-0.0188***	-0.0156***	-0.0130***
	(0.00331)	(0.00305)	(0.00257)	(0.00337)	(0.00310)	(0.00269)
SEN	-0.00329	-0.00205	-0.00393	-0.000387	0.00106	-0.00127
	(0.00363)	(0.00332)	(0.00313)	(0.00368)	(0.00333)	(0.00317)
Female	0.000103	0.000361	0.000446	0.000893	0.00114	0.00111
	(0.00303)	(0.00228)	(0.00180)	(0.00303)	(0.00229)	(0.00180)
EAL	-0.00221	-0.00564	-0.00523	0.00658	0.00370	0.00271
	(0.00768)	(0.00650)	(0.00542)	(0.00758)	(0.00632)	(0.00517)
Asian	0.00441	-0.00378	-0.00234	0.0136	0.00600	0.00619
	(0.0116)	(0.0113)	(0.00927)	(0.0114)	(0.0107)	(0.00882)
Black	0.0346***	0.0273***	0.0108	0.0514***	0.0449***	0.0261***
	(0.00808)	(0.00860)	(0.00756)	(0.00845)	(0.00887)	(0.00754)
N	491550	491550	491550	492761	492761	492761
R^2	0.080	0.087	0.098	0.076	0.081	0.091

Standard errors in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; All regressions contain LA level fixed effects. Standard errors are clustered at the LA level

Table 7 Panels A-D: Student characteristics associated with having a better secondary school choice available: Panel D: Select LAs, Performance measure is CVA

Outcome is binary, is there a better school with space in my catchment; Select LAs; Spare places = 2+, 4+, 10+; Performance measure = CVA

	2 Spare	4 Spare	10 Spare	2 Spare	4 Spare	10 Spare
FSM Eligible	0.00675	0.00851	0.0127*	0.0395***	0.0457***	0.0462***
	(0.00720)	(0.00663)	(0.00619)	(0.0113)	(0.0105)	(0.0102)
IDACI score	0.297***	0.337***	0.305***			
	(0.0639)	(0.0605)	(0.0524)			
Low KS2 score	-0.00418	-0.00451	-0.00420	0.00355	0.00429	0.00372
	(0.00678)	(0.00522)	(0.00476)	(0.00651)	(0.00528)	(0.00539)
High KS2 score	-0.0111	-0.0110*	-0.00946	-0.0197***	-0.0207***	-0.0182**
	(0.00742)	(0.00587)	(0.00617)	(0.00661)	(0.00556)	(0.00653)
SEN	-0.00658	-0.00292	0.0000662	-0.00151	0.00291	0.00537
	(0.00772)	(0.00619)	(0.00895)	(0.00800)	(0.00622)	(0.00912)
Female	-0.00780	-0.00549	-0.00206	-0.00647	-0.00402	-0.000751
	(0.00460)	(0.00454)	(0.00493)	(0.00476)	(0.00467)	(0.00508)
EAL	0.0491**	0.0388*	0.0296	0.0635***	0.0555**	0.0448*
	(0.0189)	(0.0216)	(0.0204)	(0.0200)	(0.0228)	(0.0216)
Asian	-0.00610	0.00901	0.0230	0.0109	0.0283	0.0403
	(0.0341)	(0.0331)	(0.0381)	(0.0292)	(0.0265)	(0.0314)
Black	0.0457**	0.0467**	0.0539**	0.0739***	0.0777***	0.0819***
	(0.0195)	(0.0183)	(0.0212)	(0.0240)	(0.0221)	(0.0236)
N	114162	114162	114162	114394	114394	114394
R^2	0.044	0.055	0.085	0.037	0.046	0.074

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
All regressions contain LA level fixed effects. Standard Errors are clustered at the LA level.

Table 8 Panels A and B: Comparison of School Attended and Hypothetical Reassignment: Panel A: Secondary Schools

(Quintiles are defined in terms of %5A*-C(EM) results)

Reassignment by %5A*- C (EM)

Quintile Attended	Quintile Assigned					
	1	2	3	4	5	TOTAL
Lowest	63	339	400	210	15	1027
2	0	615	1195	677	307	2794
3	0	0	263	724	796	1783
4	0	0	0	302	379	681
Highest	0	0	0	0	162	162
TOTAL	63	954	1858	1913	1659	6447

Reassignment by CVA

Quintile Attended	Quintile Assigned					
	1	2	3	4	5	TOTAL
Lowest	14	150	135	47	53	399
2	120	1002	848	458	687	3115
3	81	872	1057	762	953	3725
4	24	477	505	564	472	2042
Highest	68	538	294	211	427	1539
TOTAL	307	3039	2839	2042	2592	10819

Table 8 Panels A and B: Comparison of School Attended and Hypothetical Reassignment: Panel B: Primary Schools

(Quintiles are defined in terms of KS2 results)

Reassignment by KS2

Quintile Attended	Quintile Assigned					
	1	2	3	4	5	TOTAL
Lowest	407	1446	1349	892	630	4724
2	0	233	871	937	696	2734
3	0	0	151	587	590	1328
4	0	0	0	116	415	531
Highest	0	0	0	0	78	531
TOTAL	407	1679	2371	2532	2406	9395

Reassignment by CVA

Quintile Attended	Quintile Assigned					
	1	2	3	4	5	TOTAL
Lowest	930	760	707	650	388	3435
2	586	616	555	635	487	2879
3	417	552	532	631	543	2675
4	274	395	439	495	541	2144
Highest	181	215	318	491	469	1674
TOTAL	2388	2538	2551	2902	2428	12807

Table 9 Panels A and B: Potential grade gains from hypothetical reassignmentPanel A: Secondary Schools

Reassignment by %5A*- C (EM)

			Reassigned Pupils Mean GCSE point score		
LA	No. Pupils	No. Reassignments	At Original School	At Assigned School	Mean Gain in LA
Stockton-on-Tees	2026	244	280.4	310.6	30.2
Surrey	10410	1247	313.5	332.9	19.4
Hampshire	13666	937	321.4	331.5	10.1
Durham	5457	461	314.8	323.3	8.5
North Lincolnshire	1960	467	326.5	333.7	7.2
Lancashire	12940	1318	307.3	313.5	6.2
Wirral	3699	280	284.9	290.1	5.2
Norfolk	8552	142	302.5	306.7	4.3
Bradford	5407	1226	309.0	311.9	2.9
Wakefield	3562	125	318.5	318.5	0.1

Predicted Capped GCSE scores

Reassignment by CVA

			Reassigned Pupils Mean GCSE point score		
LA	No. Pupils	No. Reassignments	At Original School	At Assigned School	Mean Gain in LA
Devon	7642	954	317.9	338.7	20.8
Lancashire	12938	902	314.0	329.3	15.3
Bexley	3086	1269	345.5	359.8	14.3
Surrey	10410	1462	324.1	338.0	13.9
Derbyshire	8411	997	322.7	331.9	9.1
Hampshire	13662	1047	318.7	327.8	9.1
Cambridgeshire	5694	362	314.7	323.4	8.7
North Lincolnshire	1960	298	327.9	335.9	8.0
Swindon	1916	177	331.1	338.6	7.5
Norfolk	8551	218	304.1	311.2	7.1
Wiltshire	5021	172	330.3	337.3	7.0
Wirral	3697	237	332.4	338.2	5.8
Durham	5457	281	328.3	333.4	5.0
Cumbria	5378	229	321.1	325.7	4.6
Wigan	3800	411	323.7	327.1	3.4
Kent	15945	1085	346.0	329.3	3.4
Rotherham	3224	263	315.8	315.5	-0.3
Trafford	2904	455	366.0	362.7	-3.3

Predicted Capped GCSE scores

Table 9 Panels A and B: Potential grade gains from hypothetical reassignment: Panel B: Primary Schools

Reassignment by KS2

			Reassigned Pupils Mean Norm'd KS2 score		
LA	No. Pupils	No. Reassignments	At Original School	At Assigned School	Mean Gain in LA
Barnsley	4202	83	-0.37	0.06	0.43
Leicester	5452	173	-0.47	-0.07	0.40
Wiltshire	8199	304	-0.20	0.13	0.33
Nottingham	4565	237	-0.34	-0.02	0.33
Sunderland	4366	88	-0.33	-0.03	0.30
Leeds	13113	361	-0.16	0.13	0.29
Cornwall	5911	213	-0.18	0.10	0.28
Norfolk	6003	188	-0.15	0.12	0.28
St. Helens	3694	204	-0.09	0.18	0.17
Kingston upon Hull, City of	5030	197	-0.33	-0.07	0.26
North Yorkshire	6499	262	0.15	0.40	0.26
Shropshire	3785	182	0.07	0.32	0.26
Blackburn with Darwen	3019	85	-0.33	-0.07	0.26
Walsall	4790	140	-0.11	0.15	0.25
Nottinghamshire	12057	404	-0.06	0.20	0.25
Stockton-on-Tees	3829	156	-0.07	0.18	0.25
Leicestershire	9151	329	0.01	00.26	0.25
East Sussex	7288	200	-0.07	0.17	0.24
Cambridgeshire	9628	350	-0.09	0.15	0.23
Lancashire	19928	586	-0.10	0.13	0.23
Kent	23343	650	-0.26	-0.03	0.22
Hampshire	10914	325	0.05	0.27	0.22

East Riding of Yorkshire	3577	119	0.02	0.23	0.22
Liverpool	5534	373	-0.38	-0.17	0.21
Herefordshire	2907	48	-0.11	0.10	0.20
Devon	11054	373	-0.03	-.17	0.20
Oxfordshire	11716	284	-0.07	0.13	0.20
Northamptonshire	9725	246	-0.19	0.00	0.20
Stoke-on-Trent	3089	66	-0.04	0.16	0.20
York	2993	118	-0.02	0.18	0.20
Rotherham	3999	210	-0.32	-0.12	0.20
Derbyshire	8083	343	-0.01	0.18	0.19
Wolverhampton	4372	130	-0.39	-0.21	0.18
Dudley	5381	131	-0.22	-0.05	0.17
Doncaster	5030	206	-0.09	0.07	0.16
Lincolnshire	11220	527	0.01	0.17	0.16
Cumbria	4865	136	0.17	0.32	0.15
Wirral	5881	194	-0.01	0.13	0.14
Knowsley	3035	174	0.07	0.15	0.09

Predicted Normalised KS2 scores

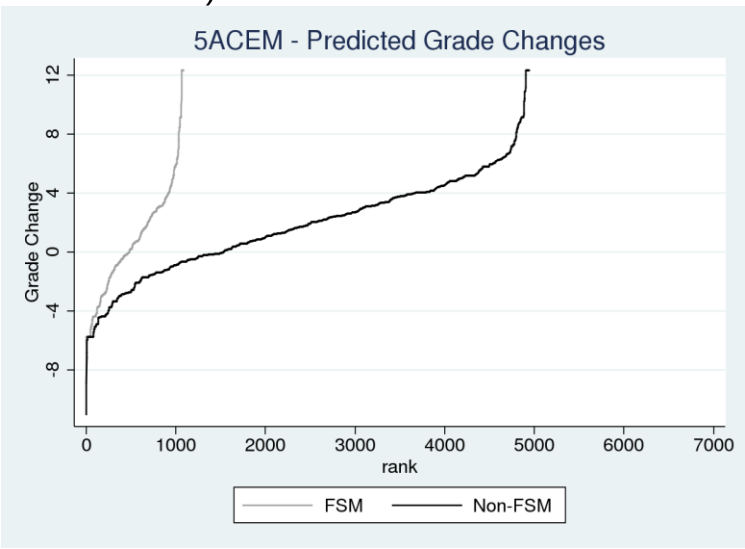
Reassignment by CVA

			Reassigned Pupils Mean Norm'd KS2 score		
LA	No. Pupils	No. Reassignments	At Original School	At Assigned School	Mean Gain in LA
Nottingham	3480	266	-0.42	-0.03	0.38
Wakefield	1735	116	0.00	0.33	0.33
Portsmouth	864	52	-0.26	0.06	0.31
Barnsley	2295	132	-0.25	-0.06	0.19
Wiltshire	7532	497	-0.04	0.14	0.18
Sunderland	2785	128	-0.11	0.06	0.17
Cambridgeshire	9176	471	-0.06	0.21	0.15
Leicester	4115	185	-0.26	-0.11	0.15
Wokingham	1333	82	0.19	0.33	0.14
Kent	22382	947	-0.19	-0.06	0,13
Cumbria	3753	218	0.15	0.28	0.13
Leicestershire	7789	463	0.13	0.26	0.13
Lancashire	11815	806	0.13	0.25	0.13
Leeds	8139	476	-0.10	0.02	0.12
Lincolnshire	10055	707	0.17	0.28	0.11
Liverpool	4308	427	-0.20	-0.09	0.11
East Riding of Yorkshire	2382	150	0.03	0.14	0.11
Nottinghamshire	9591	575	0.09	0.20	0.11
Cornwall	3909	284	0.01	0.12	0.11
Walsall	3610	262	-0.10	0.00	0.10
Oxfordshire	8627	410	0.07	0.16	0.10
Stockton-on-Tees	2159	156	0.21	0.31	0.10
Northamptonshire	7336	459	0.00	0.10	0.10
North Yorkshire	5081	401	0.19	0.28	0.09

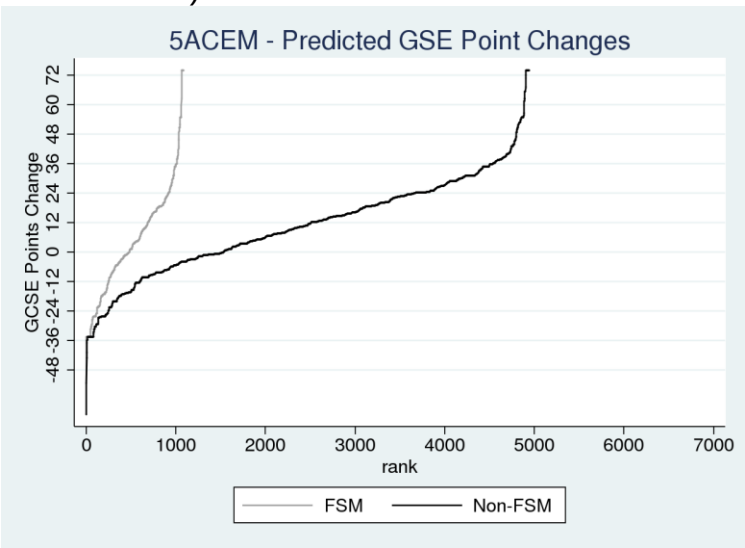
Derbyshire	6946	516	0.11	0.19	0.08
Hampshire	10225	598	0.10	0.18	0.08
Shropshire	3422	211	0.23	0.30	0.07
Wolverhampton	3082	163	-0.10	-0.30	0.07
Norfolk	4933	399	-0.08	-0.01	0.07
Doncaster	4313	225	0.07	0.13	0.06
Newcastle Upon Tyne	1968	197	0.05	0.10	0.05
Devon	9980	589	0.09	0.14	0.04
East Sussex	5314	265	0.05	0.08	0.03
St. Helens	3704	233	0.13	0.14	0.01
Rotherham	3748	218	-0.13	-0.12	0.00
Stoke-on-Trent	1096	66	-0.27	-0.27	0.00
Bath & N East Somerset	1165	90	0.16	0.14	-0.02
Knowsley	3044	248	0.12	0.09	-0.03
York	2603	193	0.10	0.07	-0.03
Kingston Upon Hull, City of	3505	120	-0.09	-0.12	-0.03
Wirral	5959	357	0.23	0.19	-0.04
Dudley	2403	136	0.09	-0.01	-0.10

Figure 1 Panels A-F: Reassignment results: student-level outcomes

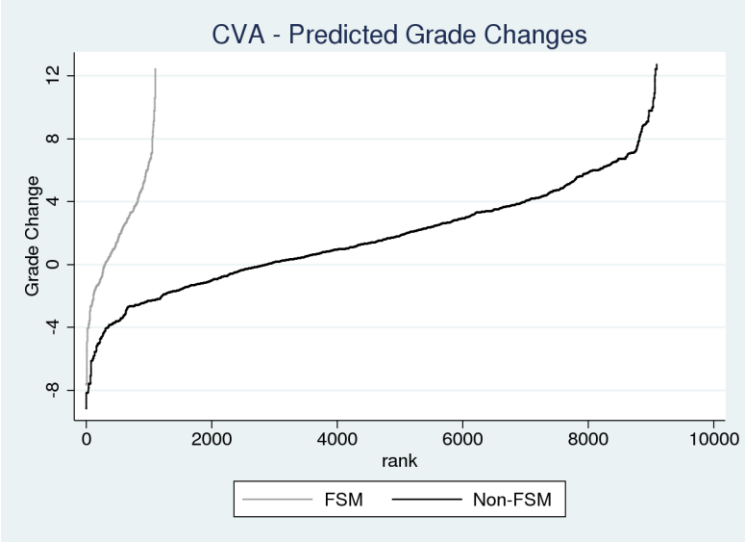
Panel A: Secondary Schools (Reassignment using %5A*-C(EM); outcome measure GCSE Grades)



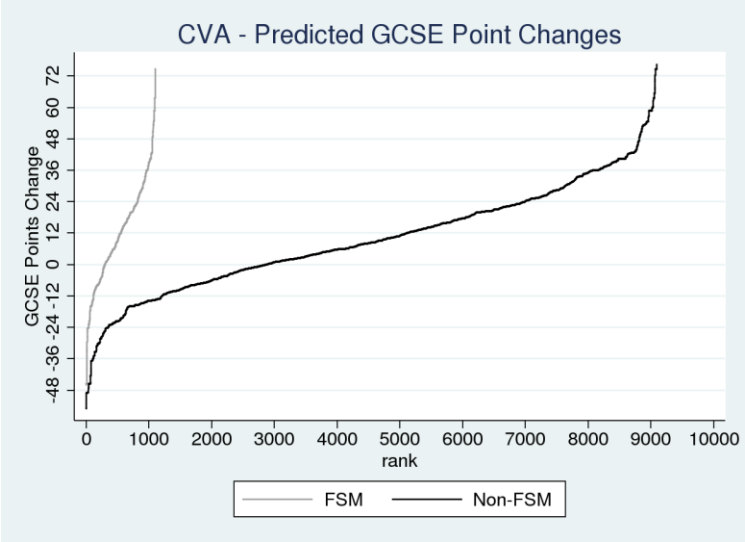
Panel B: Secondary Schools (Reassignment using %5A*-C(EM); outcome measure GCSE Points)



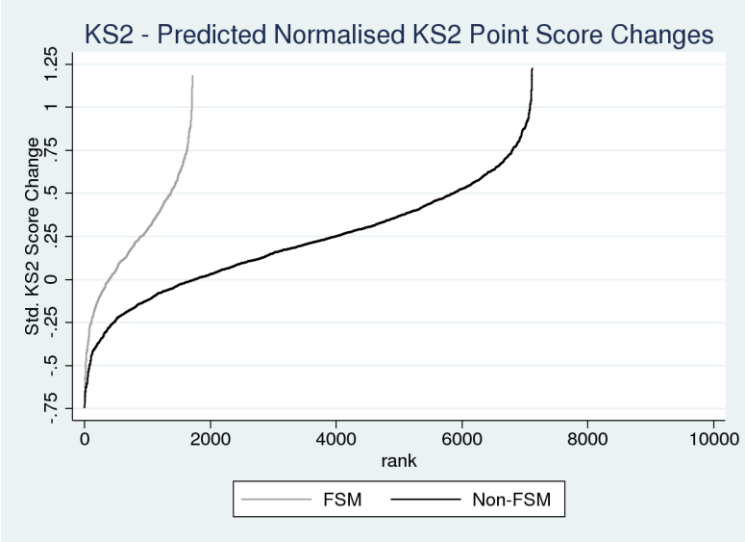
Panel C: Secondary Schools (Reassignment using CVA; outcome measure GCSE Grades)



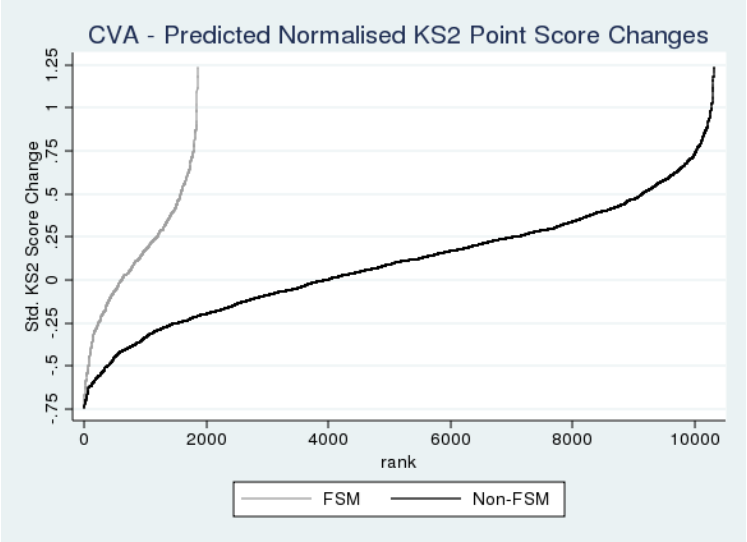
Panel D: Secondary Schools (Reassignment using CVA); outcome measure GCSE Points)



Panel E: Primary Schools (Reassignment using KS2; outcome measure norm'ed KS2 Points)



Panel F: Primary Schools (Reassignment using CVA; outcome measure norm'ed KS2 Points)



Annex 1 Tables defining ‘local’ schools

The table for defining ‘local’ primary schools is as follows:

No. Local Schools (in LLSOA)	1+	2+	3+	4+	5+
1	756	5,798	12,014	16,566	18,841
2	2,429	9,682	11,477	9,501	6,516
3	4,483	8,354	5,183	2,334	966
4	5,381	4,531	1,445	388	105
5+	18,816	2,923	408	76	21
Total	31,865	31,467	30,527	28,865	26,449

The table for defining ‘local’ secondary schools is as follows:

No. Schools in LLSOA catchment	1+	2+	3+	4+	5+
1	2,479	7,544	12,580	16,465	18,615
2	4,350	9,309	10,315	8,542	6,054
3	5,603	7,009	4,540	2,157	864
4	5,331	3,874	1,336	323	93
5+	13,743	2435	374	57	7
Total LLSOAs	31,506	30,364	29,145	27,544	25,633

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