



Dis-location

School choice, residential segregation
and educational inequality

Gabriel H. Sahlgren

Research report 4



CENTRE FOR MARKET REFORM OF EDUCATION

2 Lord North Street, London, SW1P 3LB • 020 7799 8903 • www.cmre.org.uk • info@cmre.org.uk

Dis-location

School choice, residential segregation
and educational inequality

Gabriel H. Sahlgren

About the author

Gabriel H. Sahlgren is Director of Research at the Centre for Market Reform of Education and Research Fellow at the Institute of Economic Affairs.

In 2013 he published the book *Incentivising excellence: school choice and education quality*, which discusses the conditions that need to prevail for choice to produce higher achievement and analyses a vast amount of research. He is also the author of the paper 'Schooling for money: Swedish education reform and the role of the profit motive', for which he was awarded the Arthur Seldon Award for Excellence. Gabriel holds a BA in Politics from the University of Cambridge.

The author thanks Associate Professor Henrik Jordahl, Uppsala University, for valuable comments and suggestions.



First edition published 2013
by The Centre for Market Reform of Education Ltd.

Copyright © The Centre for Market Reform of Education Ltd. 2013

The moral right of the author has been asserted.

All rights reserved. No part of this publication may be reproduced, stored in or introduced into a retrieval system, or transmitted in any form, or by any means (electronic, mechanical, photocopy, recording, or otherwise) without the prior permission of the publisher. Any person who does any unauthorised act in relation to this publication may be liable to criminal prosecution and civil claims for damages.

Every care has been taken that all information was correct at the time of going to press. The publisher accepts no responsibility for any error in detail, inaccuracy or judgement whatsoever.

Typeset and design by Alexander Blackburn

Centre for Market Reform of Education
2 Lord North Street, Westminster, London SW1P 3LB
www.cmre.org.uk
info@cmre.org.uk
[@cmr_ed](https://twitter.com/cmr_ed)

Contents

Executive summary	1
Introduction	3
The theoretical impact of choice on segregation and equity	6
What does the empirical research say?	9
1. Segregation	9
2. Equity	15
Reforms to improve integration and equity in the education system	21
Conclusion	25
References	27

Executive summary

- One of the most important arguments against school choice is the assertion that it increases school segregation, and reduces equity. Is this assertion correct?
 - In theory, school choice could increase or decrease school segregation – and the findings in empirical research are far from consistent. Some studies find that segregation increases with school choice, while others find no effects.
 - The big problem with these studies, however, is that they do not take into account the fact that parents move closer to more sought-after schools when proximity is an important factor in admissions outcomes. Indeed, research indicates that when school choice is decoupled from pupil residence, residential segregation decreases. Also, some evidence indicates that parental preferences for privately funded schools decrease when there are more opportunities for publicly funded school choice. In the absence of choice in the publicly funded education system, therefore, it is likely that housing patterns and preferences for privately funded education would differ – and this must be taken into account when analysing the impact of choice on school segregation.
 - Counter-factual housing patterns and preferences for privately funded schooling are very difficult to take into account, especially since the former's impact on school segregation often becomes apparent only in longer-term perspective.
 - The research from England indicates that total school segregation might actually have decreased following the 1988 Education Reform Act and subsequent reforms designed to instil greater choice in the system.
 - Furthermore, the only available cross-national study that avoids the problem of altered residential sorting finds that larger enrolment shares of pupils in publicly funded private schools (often used as an indicator of the degree of competition in the system) do not increase school segregation.
 - It should be noted, however, that a larger share of private funding appears related to higher school segregation, indicating the importance of policy that allows all parents to choose schools on an equal basis.
 - Overall, therefore, it is far from clear that institutionalised school choice has a net impact on school segregation, after altered residential segregation and parental preferences for privately funded schools are taken into account.
 - In terms of equity, the results are clearer: there is very little support for the idea that school choice gives rise to less equitable outcomes in the education
-

system. In fact, cross-national research indicates that larger enrolment shares in publicly funded private schools increase equity by decreasing the role of family background on international test scores.

- There is international research to the effect that choice decreases the role of family background on achievement. There is also research suggesting that school choice has no impact on achievement differences between pupils. Meanwhile, other research suggests that pupils from different backgrounds benefit from choice to roughly the same extent overall.
 - However, a higher share of private funding in the education system appears to be related to lower equity. This further supports the argument that school choice should be institutionalised so that parents from all backgrounds are given more equal opportunities to choose schools.
 - Government policy could increase school integration and equity by introducing lotteries for all over-subscribed schools, and by ensuring better transportation to schools in the form of school buses.
 - Policy could also increase equity by expanding choice to more pupils and enabling more pupils to attend better schools. This could be achieved by introducing a profit motive in education, and perhaps also by introducing bonuses to school leaders to stimulate expansion when successful schools become over-subscribed.
 - By introducing more individualised and differentiated school funding, funding levels would be more responsive to changed pupil composition, while at the same time providing stronger incentives for schools to compete among themselves for pupils of every profile.
 - To promote equity further, it would be preferable to introduce a national funding formula for all schools to ensure that people are not at a disadvantage just because they happen to live in a specific region. The current government's plans to introduce such a formula should thus go ahead. If segregation is a very strong concern, it is also technically possible to weight funding in order to stimulate more diverse schools.
 - Finally, improving information provision would also promote greater equity in the education system.
 - In order to get the design of some of these reforms right, it would also be valuable to allow experiments in different regions first.
-

Introduction

Since the Education Reform Act of 1988, successive governments have attempted to increase choice in the education system. There are many arguments for and against choice. One of the most important arguments against it is that it ‘self-evidently’ increases school segregation and reduces equity. Is this true? This paper investigates this issue by analysing international research exploring the link between choice, segregation, and equity.

Though often conflated, school segregation and equity are actually two separate issues, so it is important to begin by defining the two terms. In the literature, ‘school segregation’ refers to between-school differences in terms of pupil composition and achievement, while ‘equity’ refers to achievement differences between pupils and the importance of family background for pupil performance.

One way to analyse how choice affects equity is thus to investigate how it impacts achievement differences between pupils or the impact of family background on achievement. Another way is to focus on how different groups’ results have been affected by choice reforms. It is unlikely that all schools, headteachers, and teachers could ever be entirely equally effective, or that the impact of social background on achievement could ever be fully erased. The interesting question, therefore, is whether equity increases or decreases as a result of choice.

Section 2 shows that in theory school segregation and equity could either increase or decrease as a result of choice in education. There is choice even in primarily proximity-based admissions systems because people can still move closer to the more sought-after schools or send their children to privately funded schools. Theoretically, choice that is decoupled from pupils’ residence and wallet could thus decrease residential segregation and enrolment shares in fully privately funded schools. The question is thus how choice affects school segregation net – that is, after the changes in residential sorting and preferences for privately funded schools are taken into account. One way of increasing integration is for politicians to allocate pupils to different schools based on their background, via forced bussing, regardless of where they live – but this would be neither popular nor desirable from an equity perspective. Besides, it would be impossible to implement bussing on a national scale because pupils cannot be bussed very far. Consequently, bussing cannot prevent choice via residential sorting in a larger geographical perspective.

Section 3 discusses what international research can tell us regarding the impact of school choice on segregation and equity. In terms of segregation, the literature is somewhat mixed, although a number of studies suggest that choice accentuates between-school differences. It should be noted,

however, that these studies do not analyse the counterfactual importance of residential segregation for school segregation, and only tell us half the story. The counterfactual depends on what residential patterns would have looked like without choice that is decoupled from residence. Indeed, research shows that parents tend to move closer to higher-achieving schools when admission is based essentially or solely on proximity. A significant number of studies suggest that better school results increase house prices when proximity is important for admissions. New research also finds direct support for the idea that residential segregation decreases with school choice. Furthermore, there is some evidence that more publicly funded choice opportunities decrease parental preferences for privately funded schools. Altered residential sorting and preferences for privately funded schools must be taken into account when estimating the impact of publicly funded choice on segregation.

It is thus interesting that, if anything, the English research suggests that school segregation has decreased since the 1988 Education Reform Act, which (albeit to a limited extent) increased opportunities for school choice. This may very well be due to altered residential sorting and preferences for privately funded schools in comparison to a situation without the reform. In addition, the only cross-national study, which circumvents the problem of changed housing patterns, finds that larger pupil enrolment shares in publicly funded private schools (a proxy for the degree of choice and school competition) have no impact on school segregation. More private funding, however, does appear to be linked to increased school segregation in similar research, which demonstrates the importance of ensuring that all parents can choose schools. Overall, therefore, it is clear that the impact of school choice on school segregation is far from certain once the change in residential segregation and preferences for privately funded schools is considered. Furthermore, reduced residential segregation is an important outcome in itself, which tends to be underemphasised in the debate.

In terms of equity, the effects are clearer: there is almost nothing to suggest that school choice decreases equity. The research displays no impact at all on achievement differences between pupils, and it seems like the overall effects of choice and competition similarly benefit pupils from different backgrounds. The cross-national TIMSS and PISA research actually finds that equity increases with a higher proportion of pupils attending publicly funded private schools, in stark contrast to concerns that privatised provision would generate lower equity. Other research also supports the idea that choice-based systems, compared to admissions systems based on proximity, increases equity, precisely because in the latter system family income is more important for determining which school children attend. More private funding is linked to less equity, which again suggests that it is important to institutionalise choice so that all pupils benefit.

Section 4 discusses policy options for reducing school segregation and increasing equity. First, greater scope for choice has to be extended to poorer

families. This is best done by removing proximity as the main tie-break device to over-subscribed schools and replacing it with lotteries, supported by greater opportunities for them to use school buses. Nevertheless, lotteries do not solve the fundamental problem, which is that there are not enough options for poor families and there is too little competitive incentive for good schools to expand and for poor schools to improve. Stronger incentives to compete would increase equity by raising the lower-performing pupils' achievement. Profit-making schools seem very important for both expanding choice and introducing a mechanism by which excellence scales up, since these schools tend to grow faster while also being more prepared to set up in poorer neighbourhoods. To encourage this behaviour, we should move towards a national system of individualised per-pupil funding – which the current government now has proposed – and promote better differentiation according to pupil profile so that schools are appropriately compensated for enrolling pupils from different backgrounds and ability levels. Finally, it is argued that because we do not yet know the optimal design of such reforms, experiments should be undertaken in different regions. If this is not feasible, the reforms should at the very least be rolled out gradually across the country to facilitate scientific evaluation.

Section 5 concludes. It is clear that the relationship between school choice and school segregation is complex because of the difficulties of taking into account counterfactual residential sorting and altered preferences for privately funded schools. However, residential segregation decreases because of choice, which is an important outcome in itself. In terms of equity, choice appears to have positive, or at the very least not negative, effects. Nevertheless, it is clearly desirable to pursue reforms that could advance a more equitable choice agenda in England.

The theoretical impact of choice on segregation and equity

The theoretical explanation for why school choice may lead to increased segregation depends partly on demand. It may be the case that parents of higher socio-economic background, and greater motivation, use choice to separate their children from pupils of lower socio-economic background or with lesser ability (e.g. Ladd 2002; Schneider, Elacqua and Buckley 2006). At the same time, more motivated parents may understand the system better, and thus be able to place their children in the most sought-after schools, while children of less motivated parents more often end up in the default local state school. The former may also be better placed to make better choices for financial reasons and/or because they can access information about school quality more straightforwardly.

Supply-side factors could also give rise to greater school segregation. Schools may, for example, have incentives to focus on high-performing pupils since these are cheaper to educate than low-performing pupils (Epple and Romano 2012). If so, allowing choice may increase segregation because schools discriminate against certain types of pupils, leaving these no choice but to attend whatever school that is left after the more sought-after pupils have made their choices.¹

But it is also important to note that strictly proximity-based admissions generate two different types of choice: (1) 'Tiebout choice', where parents simply choose with their feet and move closer to the state school they prefer, and (2) parents paying for privately funded schools to a larger extent. The question, therefore, is whether choice increases school segregation net – that is, after one has taken into account these counterfactual opportunities for choice, as well as changes in parents' preference of specific residential areas and privately funded schools once choice is expanded. Theoretically, it may very well be the case that choice, publicly funded and decoupled from residence, actually decreases school segregation (Hanhusek, Sarpca, and Yilmaz 2011; Neal 2002) or barely has any impact at all because the most high-performing pupils have already left the local schools via residential sorting or privately funded schools (Walsh 2009). Even if demand-side factors do in fact push towards higher school segregation, therefore, it is far from certain whether these would be exacerbated or alleviated in a system of publicly funded choice that is decoupled from parental residence.

Equally, it is far from clear in which system supply-side factors would increase

¹ This naturally depends on the tie-break device used in cases of over-subscription. Yet, as noted below, private schools can decide where to set up, thus enabling them to target specific pupil groups in that way.

segregation the most. In England, publicly funded primary and secondary schools can normally not select pupils based on ability.² Of course, free schools may (at least in theory) choose where they open, which may give them opportunities to select pupils by opening in neighbourhoods where richer families live. Likewise, faith schools may (to a point) select pupils based on faith. In Sixth Form, however, schools are normally allowed to select pupils based on GCSE grades. At the same time, the pupils with the highest grades are likely to live in wealthier communities, so it is unclear whether this type of choice increases school segregation compared to proximity-based admissions practices.

It is thus important to understand that all types of school choice – including that which occurs in strictly proximity-based admissions systems – affect schools' pupil composition. One way to increase school integration would be to curtail choice by making politicians responsible for allocating pupils to schools in different neighbourhoods. This would probably not be popular. Whether it is a desirable option in terms of improving equity is an empirical question. The scarce research evaluating the change from bussing to school choice is discussed briefly in Section 3.2. Nevertheless, it should be noted that bussing only works within reasonably demarcated regions, since one cannot bus pupils too far. Pupils in London could not be expected to go to school in Manchester. So parents would still have opportunity to sort themselves into specific bussing zones in order to have a say over where their children go to school.

Regarding the impact of school choice on equity, it is also difficult to give any straightforward theoretical predictions. Many commentators presume that school segregation and equity are inextricably linked. But this is far from certain, and rests on the assumption that lower-performing pupils' results are improved by their being surrounded by higher-performing peers. The research on this question is rather mixed, with a fair number of studies suggesting that some form of ability grouping is not detrimental for equity (see Sacerdote 2011).³ Of course, it is also the case that any negative sorting effects must be weighed against the potentially positive effects of a better match between the pupil and the school. Segregation may very well occur because different types of pupils benefit from different types of schools and teachers. In other words, the link between school segregation and equity is nothing like as clear-cut as many assume.

Again, it is important to compare such a state of affairs with a situation in which pupils are allocated primarily on the basis of proximity. Opportunities

2 The exception is among grammar schools, but these educate only a tiny minority of the country's pupils and are unlikely to be strong drivers of segregation in the current system.

3 It is especially important to note that the impact is often non-linear. For example, some evidence suggests that all pupils gain from having higher-performing peers – but that the effect is strongest where pupils are grouped with those of their peers that perform slightly better than them rather than much better. This means that some degree of ability sorting does not necessarily decrease equity.

for choice then depend strongly on income/wealth – whether parents are able to buy a house close to their preferred school or pay tuition fees for private schools – which of course may increase the impact of parental background on pupil achievement. In a system where choice is decoupled from parental income to a larger extent, parents from poorer backgrounds might have greater opportunities to choose, which in turn could decrease the relationship between pupil background and achievement. It is thus far from certain that voucher systems, and other forms of institutionalised school choice, necessarily decrease equity. In fact, the opposite may very well be the case.

Finally, it is important to point out that system design is likely to be very important for the impact of choice on segregation and equity. Some choice programmes may have segregating effects and decrease equity, while other programmes may counter such impacts. The conclusion is that the theoretical relationship between school choice, segregation, and equity is ambiguous. The next section discusses the empirical research and the conclusions we can draw from it.

What does the empirical research say?

1. Segregation

As the previous section notes, it is difficult to analyse how school choice affects school segregation because of the problem of counterfactual residential sorting and preference of privately funded schooling. Nevertheless, the research is generally mixed, although a number of studies suggest that choice increases school segregation. This finding, however, should be interpreted with caution since a large literature indicates that residential segregation increases when admissions are based on proximity – an effect that is reflected in school segregation only in longer-term perspective.

Similarly, research suggests that preference of privately funded schools decreases with more publicly funded choice opportunities. This may explain why the overall level of school segregation actually seems to have decreased in the aftermath of pro-choice reforms in the English context. It is also supported by cross-national research, which does not find any relationship between private school enrolments (a measure of the degree of private-school competition) and school segregation, as long as the schools are publicly funded.⁴ The analyses focus on various measures of differences between schools in terms of pupil profile. There are various methodological approaches, but it is beyond the scope of this paper to discuss these in detail.⁵

Beginning with English studies, Allen (2007) analyses how secondary school segregation would be affected if all pupils attended the school closest to their homes. She finds that this counterfactual simulation yields lower income and ability segregation. The type of school choice under investigation includes access to schools that partly determine their own admissions policies – grammar schools, voluntary-aided schools, and foundation schools – as well as choice that occurred as a result of the 1988 Education Reform Act, which gave parents the right to choose a state school other than the one closest to their home (with proximity being the important tie-break device). The effects are strongest among schools that set and manage their own admissions procedures, suggesting that the supply-side factors noted in Section 2 might be

4 The paper focuses on the literature regarding segregation between schools, not between the private and the state sector overall. Some research indicates that autonomous alternatives accept higher-performing/wealthier pupils and fewer immigrants and thus leave lower-performing pupils in publicly operated schools (e.g. Hsieh and Urquiola 2006; Rangvid 2010). In America, however, autonomous schools appear to accept more pupils from less privileged backgrounds (e.g. Angrist m.fl. 2010; Hoxby 2002), and that they do not seem to cream skim pupils (Zimmer et al. 2009).

5 See Allen and Vignoles (2007) for a discussion of various measures of school segregation, and their strengths and weaknesses.

important. Burgess et al. (2007) support Allen's conclusion by showing that in areas of the country where parents have more scope for choice there is greater segregation between schools, and that this cannot be explained by residential sorting. In addition, Allen and Vignoles (2009) find that areas with more faith school competition generally have higher school segregation, although they admit that it is difficult to draw causal interpretations from this as the analysis is based on simple correlations. Nevertheless, overall, the available English research finds a link between choice and school segregation.

Findings from international research, on the other hand, are more mixed. There are a number of studies that focus on the Swedish education market. Lindbom and Almgren (2007) analyse how the pattern of school segregation would have been affected had proximity rather than choice been the sole determinant of pupil allocation. Using data between 1990 and 2004, the authors fictively reallocate pupils in accordance with proximity. They find that residential segregation is the most important explanation for both ethnic and socio-economic school segregation, but that choice appears to contribute to slightly higher ethnic sorting between schools. Socio-economic school segregation, however, appears to depend entirely on residential sorting. Using a similar approach, Östh, Andersson, and Malmberg (2012), on the other hand, analyse data between 2000 and 2006, and find that the counterfactual achievement dispersion between schools would have been much lower had pupil allocation been determined solely by proximity. They thus argue that school choice in Sweden has increased school segregation. At the same time, Nordström Skans and Åslund (2010) show that basically all change in ethnic compulsory school segregation in the period 1988–2006 in Stockholm, Gothenburg and Malmö – where parental choice has been most significant – can be explained by residential segregation.

Another approach has been to analyse how free schools in particular affect the allocation of pupils. Böhlmark and Holmlund (2011) find that free schools appear to increase school segregation. An increase in the free school enrolment share corresponding to the average in all municipalities between 1992 and 2006 explains 26 per cent of the increased between-school variation in achievement during this period. It also explains 58 per cent of the increased dispersion in levels of parents' education, 52 per cent of the increased dispersion in parental income, and 20 per cent of the increased dispersion of immigrants between schools. These results are robust to controlling for changes in residential segregation during the period.

At the same time, Söderström and Uusitalo (2010) find that a change from using proximity as the tie-break device in Stockholm's municipal upper-secondary schools increased the between-school variation in grades in the short run. Socio-economic segregation increased too, which can be entirely explained by the increase in ability segregation (the measures are naturally correlated). Yet ethnic segregation increased slightly more than can be explained by the change in ability segregation. Nordström Skans and Åslund (2010), however,

find no evidence that ethnic segregation among final year pupils at the upper-secondary school level increased in Stockholm after the change in admissions practices. If that had been the case, one would have expected a spike in school segregation in conjunction with the reform, after controlling for changes in residential segregation. The authors find no evidence of such a spike. They do, however, find a gradual rise in ethnic school segregation at the upper-secondary school level, which cannot be explained by changes in residential segregation.

These mixed findings are reflected in other international research. Studies using the counterfactual approach noted above – which fictively re-allocates pupils in accordance with the proximity rule – usually find increased segregation as a result of choice. Bifulco, Ladd, and Ross (2009) show that in Durham, North Carolina, school segregation would have been lower if pupils had been allocated on the basis of proximity. This applies to both ethnic and socio-economic school segregation. For example, segregation based on parental education would be about 10–12 per cent lower if pupils had been allocated in this way. Koedel et al. (2009) find similar effects of school choice in San Diego using the counterfactual approach. Magnet school choice, on the other hand, which takes integration into account and provides children with school buses, generates higher integration.

In Milwaukee, however, Chakrabarti (2008) finds little evidence to support the view that an increase in competition because of a policy change in 1998 changed the pupil composition in the city's schools. In Germany, Makles and Schneider (2011) analyse the impact on school segregation of abolishing catchment areas in favour of free choice at the primary school level in North Rhine-Westphalia, the country's largest state in terms of population. They find no impact at all in the short run. The same conclusion is reached in another study, which only includes Wuppertal, a city in the same state (Schneider et al. 2012). Similarly, in the Netherlands, de Haan, Leuven, and Oosterbeek (2011) analyse a policy change that decreased the number of schools, and arguably thus also reduced choice and competition, and find no evidence that school segregation decreased. In America, using data from all 3,000 US counties, Chingos (2013) finds no impact of increasing charter school enrolment on school segregation in the period 2002/03–2010/11.

The question, however, is what any of the above studies can tell us since none of them take into account counterfactual residential sorting and counterfactual enrolment shares in privately funded schools. For example, 25 per cent of American parents say that they bought their houses partly in order to ensure that their children could attend a good public school, while 11 per cent of pupils attend private schools for which parents have to pay out of their own pockets (Greene et al. 2010). This shows that many parents choose schools regardless of whether there are any institutionalised school choice programmes in place. Indeed, a significant number of studies find that house prices increase in areas with schools whose average performance is higher (see Nguyen-Hoang and

Yinger 2011 for a review).⁶ Since higher house prices generate higher residential segregation over the long term, this would indicate that school choice decreases the importance of residential sorting for school segregation.

Indeed, three new studies find support for the idea that school choice directly affects house prices. Machin and Salvanes (2010) analyse a reform in Oslo, Norway that introduced performance-based upper-secondary school choice, with compulsory school grades as the main tie-break device. The authors find that this reform reduced the relationship between school performance and house prices by at least 50 per cent. The relationship between school performance and the probability that families move was at the same time reduced by 20–25 per cent after the reform, which shows that moving patterns are affected by increased opportunities for choice. In Paris, Fack and Grenet (2010) find that the relationship between the performance of publicly operated schools and house prices is no longer apparent when the houses are located close to publicly funded private schools. New British research also suggests that the impact of school performance on house prices is only significant if schools use proximity as their tie-break device (Gibbons, Machin, and Silva 2013). These studies thus indicate that opportunities for school choice alter housing patterns, and thus decrease the relationship between school performance and house prices.

At the same time, Brunner, Choe, and Reback (2012) find direct evidence that US inter-district school choice decreases residential segregation: in areas with lower-performing schools, house prices and the average income level increase after allowing school choice between the districts, while house prices and the average income level decrease in areas with higher-performing schools. This is exactly what theory predicts since parents no longer have to live closer to the sought-after schools. The results indicate that a one percentage-point net outflow of pupils from a district through choice increases house prices and the average income level by about 4 per cent. These choice programmes only comprise 4.8 per cent of the pupil population in the average district; it is likely that larger programmes would have even stronger effects.

Other studies also support the idea that parents move to put their children in higher-performing schools when proximity plays an important role in admissions. Allen, Burgess, and Key (2010) analyse whether English parents move when their children are approaching secondary school age. They find that lower school quality induces people to move more frequently and that residential segregation increases. The impact, however, is small, which the authors argue might be due to the fact that parents move to areas with good schools even before they have begun primary school. This idea is supported by Burgess and Briggs (2010) study, which shows that the most important

⁶ Just because house prices increase with higher average performance does not necessarily mean that parents value higher school effectiveness. It could be that they value peer quality instead, although it is unclear whether this depends on actual preferences or poor information (Sahlgren 2013).

reason why pupils of low socio-economic background attend lower-performing secondary schools, compared to pupils from high socio-economic background, is the area in which they live. They thus argue that more opportunities for school choice can be an important tool for helping poorer pupils to attend better schools, and thus for reducing the link between school segregation and residential segregation.

The above research thus indicates that studies which do not take into account that school choice decreases residential segregation exaggerate the impact of school choice on school segregation. If school choice is tied to residence, parents will often relocate, which in turn ensures that residential segregation becomes more important for school segregation than otherwise would have been the case. The problem is that these effects often emerge only over the long term, especially at the school level, and they are difficult to analyse. Parents often choose where they will live long before their children start school (even sometimes before they have children), so that it takes time before altered moving patterns start having an impact on school segregation.

In addition, some research suggests that the share of pupils in purely privately funded schools decreases when parents can choose more publicly funded alternatives (Buddin 2012). This supports the idea that institutionalised school choice also impacts preference of fully privately funded schooling. In absence of choice reforms, therefore, it is possible that enrolment shares in privately funded schools would be higher. Again, it is important to take into account such counterfactual scenarios when analysing the impact of choice on school segregation.

It is therefore very interesting that the consensus in the English literature is that overall segregation by income has not increased after the Education Reform Act of 1988 and subsequent reforms aimed at instilling more choice in the education system. In fact, research more often finds an overall decrease in school segregation since the 1980s (Allen and Vignoles 2007; Gorard 2004; Gorard, Fitz, and Taylor 2001). Gibbons and Telhaj (2006) also find that ability segregation in schools has barely changed overall during the period 1996–2002. They find no support for the argument that reforms designed to stimulate choice have increased the between-school variation in achievement. If anything, the relationship is the opposite: there has been a small overall decline in ability segregation over time. This, of course, does not evidence any causal impact that the reforms may have had on school segregation, merely that there is no simple covariance over time – which in turn may very well be due to altered residential sorting and preference of privately funded schools, compared to a situation in which no pro-choice reforms had been carried out.

Since it is difficult to analyse counterfactual moving patterns within countries, it is also important to consider cross-national research on the subject. This is because it is implausible that parents move between countries in order to choose better schools for their children. This makes it easier to analyse the total

impact of choice on school segregation in a longer-term perspective. There is one study on this topic.⁷ Using PISA 2006 data, Allegre and Ferrer (2010) analyse the impact of different variables on socio-economic school segregation. The authors find that the share of pupils in publicly funded private schools has no impact at all on school segregation. The same applies to the share of pupils attending schools that compete with other schools.⁸ The share of pupils attending privately funded schools does, however, have a segregating effect. While one should be cautious in drawing too strong conclusions from this research, because it can be difficult to compare pupils in different countries, it nevertheless supports the idea that school choice decoupled from parental income and residence does not have a net impact on school segregation once changing residential patterns are taken into account.

Overall, then, it is difficult to draw conclusions from most studies analysing the relationship between school choice and segregation, since they do not take counterfactual housing patterns into account. School choice seems to decrease residential segregation, which is the variable that has the strongest impact on school segregation when proximity is key for the allocation of pupils. Similarly, publicly funded school choice seems to alter parental preference of privately funded schools, which must also be taken into account. More research is clearly needed to separate the different effects, but it is intriguing that school segregation if anything seems to have decreased in the aftermath of school choice reforms in England, and that publicly funded choice is not systematically related to the extent of school segregation when comparing different countries.

In addition, from an equity and efficiency perspective, it is far from clear that we should prefer residential segregation to school segregation. Card and Rothstein (2007), for example, find that residential segregation affects achievement negatively, but that school segregation has no independent impact. While more research is needed, it is nevertheless important to note that it is not clear why we should prefer higher residential segregation to higher school segregation (even if it were the case that school choice lowers the former and increases the latter). This becomes even more obvious when considering other negative effects of residential segregation, such as on physical and subjective health (Ludwig and Duncan et al. 2012; Ludwig and Sanbonmatsu et al. 2011).

It is also important to note that it is not clear that classroom segregation would increase even if choice increases school segregation. Heterogeneous schools may very well have homogeneous classes. For example, American school districts often create within-school streaming programmes to attract white pupils to high-minority schools (Card and Rothstein 2007). In Sweden, also,

7 There are a couple of other studies, but they only analyse correlations without controlling for other important variables, such as the first age of streaming, or separate publicly funded private schools from privately funded (e.g. Jenkins, Micklewright, and Schnepf 2008).

8 This variable is only significant when not controlling for the share of pupils in privately funded schools or the first age of streaming.

there is evidence that pupils are divided into classes based on their residential area within schools (Åman 2011). This is important since the classroom is probably a more important unit of analysis in terms of potential peer effects on achievement. If pupils in heterogeneous schools with homogeneous classes utilise their choice opportunities more than others, classroom segregation might simply be transformed into school segregation – without a net increase in total segregation at the classroom level (Åman 2011). Indeed, there is support for this in the US, where intra-school ethnic segregation increases if schools are more integrated at the school level (Card and Rothstein 2007). Even if school choice increases school segregation net after altered residential segregation and preference of privately funded schools are taken into account, this may simply unveil previously unseen classroom segregation.

Of course, it is not clear whether school or classroom level segregation is more important for outcomes other than academic achievement. Heterogeneous schools could be a meeting ground for pupils from different backgrounds, regardless of the level of classroom segregation, which may very well be important for a well-functioning society. This, however, is far from certain, and it may very well be better to have highly integrated classrooms with pupils first and foremost meeting their friends at this level.

2. Equity

Turning to equity, there is very little evidence to suggest that school choice has negative effects. In England, there are no studies directly evaluating the impact of choice on equity. However, international research has evaluated both the effect of school choice on the role of parental background for pupil achievement and on achievement differences between pupils. In addition, studies indicate that the total effects of choice and competition are very similar between different groups of pupils.

First, it is important to consult the cross-national research, which analyses whether greater opportunity for school choice within countries affects the impact of parental background on achievement in international surveys, such as PISA and TIMSS. The advantage of this research is that it can reveal the long-term effects of school choice. Furthermore, it takes into account choice within entire countries, and so avoids potential dispersion effects between within-country regions that may lead to underestimated effects of choice.⁹ A disadvantage with the cross-national research, however, is that it can be difficult to account for cultural factors that affect equity. Another problem is that important variables may differ qualitatively between countries, making it more difficult to interpret the results. For example, Swedish free schools are different from Dutch private schools. Nevertheless, because of its strengths, it is still

⁹ See, for example, Vlachos (2010) who argues that the impact of competition on grade inflation may be underestimated because of such dispersion effects across municipalities in Sweden. This, of course, applies to the potential impact on achievement and equality, too.

valuable to consult the cross-national research on the subject.

And, interestingly, these studies indicate that choice increases equity in the education system. Schutz, West and Woessmann (2007) analyse data from PISA 2003, covering over 180,000 pupils in 27 countries. They find that a 10 percentage point increase in the share of publicly funded private schools decreases the impact of parental background on achievement by 2.8 per cent in mathematics and 2.5 per cent in science. This relationship is entirely contingent upon public funding: a higher percentage of private funding in the education system generates lower equity.

In another study, Brunello and Checchi (2007) focus on how academic selection in the education system affects equity, both in the short and long term. The authors also include the share of pupils in private upper-secondary schools, but, unfortunately, they do not control for the share of government funding at the same time.¹⁰ Yet they still find that larger private school enrolment shares decrease the impact of parental background on (1) the likelihood that pupils pursue tertiary studies, (2) achievement in the International Adult Literacy Survey (IALS), a test for people over the age of eighteen, and (3) wage inequalities later in life. At the same time, they find no robust support for the idea that private schools would increase the effect of parental background on other important outcomes.¹¹ They also find that larger private school enrolment shares decrease the importance of parental background in terms of PISA 2003 average achievement in mathematics, science, and reading. Larger publicly funded private school enrolment shares thus seem to be either positive or irrelevant for equality in education, both in a short and long run perspective.

In another study, Schutz, Ursprung and Woessmann (2008) find similar results when analysing TIMSS scores. The authors utilise the number of books at home as a gauge of social background, which partly measures whether the pupil's family environment is conducive for education and partly serves as a proxy for parental education and income. The estimates indicate that a 10 percentage point increase in the private school enrolment share decreases the impact of pupil background for the average grade in TIMSS mathematics and science by 3.2 per cent. At the same time, a 10 percentage point increase in the share of private funding in the education system raises the effect of pupil background on achievement by 5.2 per cent.

It is important to point out that the above studies control for unobservable

10 They do control for public funding, but not in the same model as the one in which they control for the share of pupils in private schools.

11 The authors find that achievement differences later in life increase as a result of larger private school enrolment shares, but this impact disappears when they control for the interaction between parental background and the share of pupils in vocational upper-secondary school programmes. This is important to control for since differences between academic and vocational programmes seem to be important for the likelihood of being employed later in life (Hanushek, Woessman, and Zhang 2011).

variables that impact achievement, but which are country-specific. This decreases the risk that cultural factors are driving the results.¹² Another study analysing differences between German states supports this interpretation. Woessmann (2007) finds that higher private school enrolment shares lead to a lower impact of parental background on pupil achievement in PISA, which indicates that the above-cited results are not driven by cultural differences between countries. Certainly, Woessmann's findings could technically be driven by differences across different German states, but the study nevertheless lends further support to the view that greater opportunity for choice increases equality in educational achievement.¹³

Only two cross-national studies display somewhat different results. Raitano and Vona (2011) analyse PISA 2006 mathematics scores, and find no impact of private schools on the effect of social background (using the number of books at home as a proxy) on achievement. However, they find no impact of other important variables, such as the share of private funding, the first age of streaming in the education system, and how long pupils spend in kindergarten – which prior PISA research indicates are important.¹⁴ This may depend on misspecification, since the authors do not hold constant many important variables at the individual level as Schutz, West, and Woessmann (2007).¹⁵ Furthermore, since all other studies analysing PISA, TIMMS, or IALS scores find positive effects of private school enrolment shares on equity, their results are hardly robust.¹⁶ Nevertheless, the authors never find any support for the thesis that equality in education would decrease as a result of instilling more choice in the system.

At the same time, Amermueller (2012) analyse whether higher private school enrolment shares increase the effect of parental background on PISA scores, controlling for this impact in the Progress and International Reading Literacy Study (PIRLS) among pupils in fourth grade. In this way, it is possible for the author to analyse whether a change in the private enrolment share between different grades induces a change in equality. The author finds that private schools increase the impact of a conducive learning environment (having more books at home), but have no effect on the importance of parental education levels (measured directly). However, the author does not take into account

12 This cannot be ruled out, however, since the impact of family background in this specification may still correlate with the unobserved differences between countries.

13 The author does not control for the share of private funding in the different states, but argues that privately funded schools are rare in Germany. Most private schools are funded publicly or by voluntary organisations, and there are no parental fees.

14 There is only an impact of private funding when the authors exclude country-fixed effects from the equation.

15 For example, they do not control for the language the pupils speak at home, whether the pupils have repeated grades, at what age the pupils started school, and whether the pupils spend more than one year at kindergarten.

16 This interpretation is further bolstered by the fact that the same authors do find a positive impact of time spent in kindergarten on PISA science scores when using the ESCS index as a measure of social background, while also controlling for more variables at the individual level (Raitano and Vona 2010).

whether the schools are publicly or privately financed and at what age pupils are streamed by ability – which most other studies find are very important. It should also be noted that the impact actually disappears when the test scores are standardised to take into account that PIRLS and PISA are different tests. Due to these issues, therefore, the study should not be taken to add support for the argument that privately operated schools and choice per se generate lower equality in education.

Apart from cross-country research, there is also one interesting study from South Korea. Song (2012) analyses a reform that replaced performance-based school choice to upper-secondary school – without any consideration for where pupils lived – with a system of proximity-based admissions.¹⁷ He finds that the move towards proximity-based admission increased the impact of the father's level of education on university admissions test scores. He also finds that house prices in the higher-performing school districts rose by 13 percentage points after the reform, which in turn increased residential segregation around the best schools (in accordance with the research noted in Section 3.1). This indicates that school choice to upper-secondary school, in this case based on performance in lower-secondary school, may be better for equity than proximity-based admissions systems.¹⁸

In addition to having analysed the impact of choice on the role of pupil background in determining achievement, there is also research from Sweden that (1) analyses the impact of choice on overall achievement differences between pupils, and (2) sheds light on whether the overall impact of choice benefits some pupils more than others. Fredriksson and Vlachos (2011) analyse whether changes in achievement differences between high- and low-performing pupils in the period 2000–2009 differ in municipalities with more than one school as compared to those with only one school. In the latter, school segregation cannot have increased (since there is only one school available in the municipality), while parents also have fewer opportunities to choose schools. The authors find no differences at all. This indicates that even if choice increases school segregation, this has had no impact on equity measured as achievement differences between high- and low-performing pupils.

However, it is clear that municipal school choice remains very restrictive, both within and between municipalities (see footnote 1). Thus, it is important to understand how free schools have affected the overall achievement

17 Analysing this reform is advantageous compared to similar reforms at the primary- and lower-secondary school level in for example Finland, Norway, and Sweden, where the number of years of schooling also increased. This makes it difficult to disentangle what drives the results in research focusing on these reforms (Malamud and Pop-Eleches 2011). Furthermore, pupil allocation in these education systems was proximity-based to a certain extent before the reforms, while it did not matter at all in the pre-reform South Korean system.

18 The research is mixed in terms of how academic selection practices affect equality in lower grades (see Betts 2011; Jakubowski 2010; Waldinger 2007), and it is not clear that the results are valid there. It appears to be the opportunity for choice, not the tie-break device, which drives Song's results, since proximity-based admissions increase residential segregation.

differences between pupils. Böhlmark and Holmlund (2011) analyse the impact of changes in the free school enrolment share on changes in achievement differences between pupils in the period 1992–2006. They find no impact at all. Unlike Fredriksson and Vlachos, furthermore, they have access to pre-reform data, making it possible to evaluate whether pre-reform trends in the municipalities affect the results. They find no indication that this would be the case. In Sweden, therefore, there is nothing to suggest that choice increases achievement differences between pupils.

Finally, another way of evaluating how equity is affected by choice is to estimate the overall effect of choice reforms on different groups of pupils. To the best of the author's knowledge, there is only one paper evaluating this in England. Bradley and Taylor (2010) analyse the impact of quality competition and find that it benefited schools with higher proportions of pupils eligible for free school meals and ethnic minorities more than schools with pupils from more socio-economically advantaged backgrounds. While there are methodological problems with this research (Sahlgren 2013), making it important to interpret the findings with caution, if anything it suggests that disadvantaged pupils benefit more from the systemic effects of school choice in England. A study by Machin and Silva (2013) indicates that attending academies benefit higher-performing pupils only, but it is limited precisely because it cannot take into account competition effects which may have raised the achievement of lower-performing pupils more than higher-performing pupils across the board. If that is the case, the research underestimates the total impact of choice on lower-performing pupils, which is what is mostly interesting from a policy perspective.¹⁹

Analysing the system-level impact on different pupil groups, Hoxby (2000) finds little evidence of heterogeneous effects when analysing school choice exercised via residential choice in America. In Norway, choice seems to benefit pupils from lower-educated backgrounds more than pupils from higher-educated backgrounds at the upper-secondary level (Høiseth Brugård 2013). In Sweden, in turn, Ahlin (2003), Björklund et al. (2005), and Böhlmark and Lindahl (2007), all find that the free school reform has affected pupils from different backgrounds somewhat differently, but there is no unanimous evidence that it has benefited some groups more than others. The most methodologically convincing study by Böhlmark and Lindahl (2007), which also exploits the longest panel of data, finds no evidence that immigrant pupils or pupils from low income families benefit less than others. They do find that the positive effect is stronger among pupils from families with high parental background, but the main point is that there is no clear evidence that the free school reform has benefited pupils from more advantaged socio-economic backgrounds more than those that come from disadvantaged socio-economic backgrounds.

The above papers merely analyse the effects of the free school reform. Niepel

19 In America, interestingly, the research generally suggests that underprivileged children benefit the most from attending a school of their parents' choice (Sahlgren 2013).

(2012), however, analyses how school choice and competition – between both municipal and free schools – affect pupils from different backgrounds. The author finds that the short- and long-term effects – for example, ninth grade achievement, crime levels later in life, achievement on the conscription service test, and university enrolment – barely differ at all between pupils from different socio-economic and ethnic backgrounds. This indicates that all groups appear to have benefited equally from the overall school choice reforms, although pupils from low-income households and pupils in areas with higher crime rates actually benefitted slightly more, especially when it comes to the long-term impacts.²⁰

Overall, therefore, international research suggests that greater opportunity for publicly funded school choice if anything increases equity in education. Private funding, on the other hand, seems to have a negative impact, which is not surprising. In such systems, parents who can afford to pay for their children's education have a significant advantage. This strongly indicates that well-functioning choice systems must be designed to allow all people to participate. Again, it is important to note that greater opportunity for publicly funded choice seems to decrease parental preference of privately funded schools (Buddin 2012). It is not necessarily desirable that parents who can afford should not pay anything for their children's education, and decreased private school enrolments also mean higher state education expenses, but it highlights how publicly funded choice programmes can ensure that underprivileged children are given more similar opportunities as privileged ones.

It should be noted that the above studies do not compare choice with forced bussing, which may increase school integration compared to both proximity-based admissions and choice decoupled from residence and wallet. There is, to the best of the author's knowledge, only one study that compares the transition from bussing to free school choice at the system level. In Tel-Aviv, Israel, Lavy (2006) finds that free state school choice increased achievement – an effect that is stronger among pupils from lower socio-economic backgrounds. He also finds that pupils ending up in schools with stronger peer groups did not benefit more. This indicates that forced bussing is not desirable from an equity perspective. Since there is no equivalent research from other countries, however, one should be careful in drawing general conclusions in this respect.

20 Some international studies evaluate the differential impacts of various forms of independent/charter school competition on pupils in state schools only. This research does not find consistent evidence that some pupils benefit more than others either (e.g. Booker et al. 2008; Imberman 2011; Sandström and Bergström 2005; Winters 2012). Again, however, the focus here is on the systemic effects across all school types, which are the most relevant from a policy standpoint.

Reforms to improve integration and equity in the education system

Thus far, this paper has evaluated both theoretical arguments and empirical evidence regarding the impact of school choice on segregation and equity in education. This section proposes reforms to reduce school segregation and improve equity further. While it is far from clear that school segregation is always bad for equity (as noted in Section 2, it may very well lead to an improved match between pupil and school), a highly segregated school system would probably be problematic, regardless of the impact on achievement and equity. Strong school segregation could result in social fragmentation, which would clearly be negative in and of itself.

As a first measure to improve both integration and equity, it is important to abandon proximity as the main tie-break device when schools are over-subscribed and instead use lotteries. Lotteries are a neutral device for deciding between different pupils, and have the potential to break school segregation stemming from residential segregation. This is because it would no longer pay off to live closest to the best state schools. The introduction of lotteries would necessitate that other reforms countering their impact be avoided. In Brighton and Hove, for example, where there was an experiment with lotteries, segregation did not decrease as one might have expected because new catchment areas were drawn in a way that excluded poorer families from the more sought-after schools in the city (Allen, Burgess, and McKenna 2013). Abolishing catchment areas would clearly be an important step towards ensuring that lotteries have a significant impact. Introducing lotteries would also free up choice and competition among state schools, which would increase the potential for these mechanisms to raise standards.

Academic and other selection practices might be trialled, but the research is inconclusive on how this would affect efficiency and equity (Betts 2011; Jakubowski 2010; Waldinger 2007). Such practices may introduce stronger incentives among schools to enhance their reputation by selecting higher-performing pupils rather than by raising quality (MacLeod and Urquiola 2012). The likelihood of this being the result probably also depends on how well differentiated the per-pupil funding is in the system (Epple and Romano 2012). Unintended consequences, such as lost opportunities for specialisation among different types of pupils, and wasted incentive effects on achievement in lower grades (see Haraldsvik 2012; Koerselman 2013; Vlachos 2010), should also be taken into account. Given that all Western countries apply some form of selection practices at the upper-secondary school level, this is less controversial than in primary and lower-secondary education. Nevertheless, it would be advisable for selection practices only to be allowed in experimental form for now.

This, in turn, means that school bus provision should be expanded significantly, at the very least in primary school. School buses may be important for ensuring that parents from poorer backgrounds have the opportunity to utilise choice to the same extent as parents from wealthier backgrounds (Chakrabarti 2013). In Denver and Washington, D.C., 66 per cent of parents, and 80 per cent of parents with the lowest income, report that they would choose a better school that is located farther away from where they live if transportation were provided (Teske, Fitzpatrick, and O'Brien 2009). Since young pupils cannot be required to travel too far to school by themselves, school buses could be a good complement to the introduction of lotteries as a tie-break device.

Nevertheless, we should recognise that while lotteries may decrease school segregation and ensure equal access to good schools, their introduction is not a long-term solution to the fundamental problem of inequity. Increasing the achievement of some pupils from less advantaged backgrounds will improve overall equity to a degree, but in the long run, ensuring that more pupils have choice and access to good schools is the best way to stimulate equity.

The most effective means of expanding choice is through introducing a profit motive to education. Profit-making schools are more likely to expand choice to the poor especially. Evidence from Chile suggests that profit-making schools that do not charge top-up fees enrol more pupils from disadvantaged backgrounds than municipal and non-profit schools (Elacqua 2012). And in Sweden, for-profit free schools enrol more pupils of similar background to those in municipal schools than non-profit free schools. At the upper-secondary school level, in fact, there is basically no difference between for-profit schools and municipal schools (Vlachos 2012). This indicates that for-profit schools tend to expand choice among the poor to an extent that non-profit schools do not. The cross-national evidence suggests that expanding access to publicly funded private schools raises equity; the profit motive clearly has an important role to play here.

The introduction of a profit motive in education is also important for expanding access to good schools. Successful profit-making schools have the strongest incentives to expand, especially in poor communities. For example, whereas research from Chile suggests a relationship between improved quality and enrolment growth in for-profit schools that serve disadvantaged pupils, there is no such relationship in non-profit schools (Elacqua 2009). At the same time, there is no evidence that high-performing charter school networks in California receive greater donor funding than low-performing networks, which may not be too surprising as there are few incentives among philanthropists to ensure they back the best schools (Coulson 2011). This indicates that the profit motive can be important for scaling up excellence, and in this way improving equity.

The policy implication is that the government should allow commercial companies to start and run free schools. It would also be beneficial if bonuses were given to school leaders of all successful and over-subscribed schools when

they scale up. This would incentivise popular and high-performing schools without a direct profit motive to take on more pupils.

It is also important to individualise and differentiate funding further. The current funding system is essentially a de facto voucher system in which most of the money is allocated on a per-pupil basis, with additional funding for schools that enrol pupils receiving free school meals or special needs pupils. Yet funding levels do not change in accordance with changes to schools' pupil profiles over time because LEAs tend to base their funding formulas on historic approaches that do not adequately take these changes into account (Chowdry and Sibieta 2011). This means that schools that increase their number of disadvantaged pupils are not compensated accordingly. A fully-fledged voucher system would address this and ensure that changes in pupil composition are directly reflected in school funding. Also important, the voucher should be differentiated after more detailed socio-economic and ability profiling than the crude differentiation measures of today. This would better ensure that schools are compensated for taking on pupils who are more expensive to teach. There are various ways in which this differentiation could be achieved, which is explored in more detail in future work (Sahlgren, forthcoming) but the main idea is that the differentiation would give strong incentives among schools to enrol pupils from different types of backgrounds.

Clearly, the above suggestion also entails the development of a national funding formula to replace the fragmented and complicated system of today's Local Authority funding, which creates disparities in funding also across schools of similar pupil composition (Chowdry and Sibieta 2011). Though some progress has been made in passing back to Academy converters that portion of central government funding previously 'top-sliced' by Local Authorities to finance the provision of services that may or may not have been relevant to schools' needs, how much money schools receive for the benefit of pupils is still largely dependent on where they are in the country. A national per-pupil funding formula, with a much more sophisticated differentiation than the current one, would thus clearly increase equity in the system in terms of funding. The government is thus correct in seeking to implement such a system in the coming years (Adams 2013).

There is no reason why such a model could not be applied in a system of both privately operated schools, such as free schools and academies, and traditional LEA-controlled state schools. One example is the Netherlands, which combines a national voucher system with autonomous schools and schools that are under the auspices of municipalities.²¹ Another example is Chile, which also combines a national voucher system with municipal and private schools. In fact, there is a clear advantage in separating the funding and operation of publicly operated

21 Since 2006, however, the operation of municipal schools was handed over to independent school boards to make them more like private schools and preclude any political intervention on their behalf. Yet the ultimate responsibility for these schools still lies with the municipality.

schools to ensure that there are fewer incentives and opportunities among local politicians and bureaucrats to intervene in the affairs of the schools over which they preside. Of course, in the long run, it is not necessarily the case that state schools would continue to exist as the enrolment shares in privately operated schools would be likely to increase.

To combat school segregation, it would also technically be possible to weight the voucher depending on the heterogeneity of the pupil body. This would give stronger incentives to schools to attract pupils from different backgrounds. One should remember, however, that this might have unintended consequences on overall achievement and equity since some types of segregation may actually have beneficial effects, as noted. The main point is to highlight how malleable an individualised funding system could be: various top-ups could be added to take into account various concerns.

Another important reform would be to improve the information system and make it more accessible than today. Much research indicates that parents may care about school quality, but that information is important for ensuring they make good choices (Sahlgren 2013). This appears to be the case especially among low-income parents (e.g. Hastings and Weinstein 2008; Hussain 2013). Better information and dissemination would probably thus be important for improving equity and integration in the education system. Sahlgren (2013) provides a more detailed discussion regarding the type of information needed and how this can be provided.

Since the exact design of some of the reforms is not clear, however, it would be valuable to undertake experiments in different regions. For example, one could allow some regions to experiment with lotteries and incentive systems for school expansions to analyse whether or not they actually have any effects. If one does not want to experiment before one settles for a national policy, rolling out the reforms gradually across the country would at least ensure that researchers could evaluate them rigorously.

Conclusion

This paper has discussed the effects of school choice on segregation and equity. It has argued that the theory is ambiguous. British studies have indicated that choice might increase school segregation, while the international research is somewhat more mixed. However, all studies are limited since they do not take into account that residential segregation often decreases when choice is decoupled from residence, and that preference of private schooling might be stronger in the absence of institutionalised choice programmes. Research suggests that house prices increase together with school results, but this seems to be the case only when proximity is important for school admissions. There is also direct empirical support for the notion that greater opportunity for school choice decreases residential segregation – which is an important finding in its own right – though it takes time before this is reflected in school segregation. Some evidence also suggests that more publicly funded choice opportunities decrease enrolment shares in privately funded schools. In other words, parental preference of certain neighbourhoods and privately funded schools are likely to be different if there are no official choice programmes in place, and it is crucial to account for the counter-factual scenarios when analysing the effects of choice on segregation.

It is thus interesting to note that overall school segregation seems to have decreased in the aftermath of school choice reforms in England, which may very well be due to different housing patterns and changed preference of private schooling than would have been the case without the reforms. In addition, research using PISA data to analyse school segregation in different countries – which circumvents the problem of counterfactual residential sorting – finds no relationship between school segregation and the share of pupils in publicly funded private schools or the share of pupils in schools that compete with each other. Overall, this indicates that we should be careful not to draw too strong conclusions from studies that do not take into account that choice affects residential segregation. In addition, the same studies ignore the level of classroom segregation, which some research suggests increases when schools are more heterogeneous.

At the same time, the evidence indicates that choice may actually increase equity. Cross-national research suggests that larger enrolment shares in publicly funded private schools decrease the role of parental background on a number of variables, including PISA/TIMSS results and wage inequalities later in life. On the other hand, more private funding in a system appears to decrease equity. One study from South Korea found that parental background became more important for achievement when performance-based school choice was abolished in favour of proximity-based admissions in upper-secondary school. This is likely to be because family income, via residential sorting, became more important for school assignment. Other studies, meanwhile, find no impact

of school choice on achievement differences between pupils, and different types of pupils appear to benefit equally from choice overall. In England, there is actually some evidence that more disadvantaged pupils benefit more from competition than disadvantaged ones. Overall, it thus seems to be the case that greater opportunity for school choice, if anything, raises equity in education rather than reducing it.

Finally, the paper suggested reforms to improve integration and equity. Lotteries are preferable as a tie-break device when schools are over-subscribed. Expanded use of school buses might thus also be important to make sure that younger pupils do not have to travel too far to school by themselves. However, lotteries are not a long-term solution to the problem, which is that too few pupils have bon fide choice and access to good schools. In order to remedy that problem, the introduction of a profit motive is important. For-profit schools have stronger incentives than other schools to expand choice for all, as well as to scale up excellence. To further incentivise all schools to grow, one could also envisage bonuses to school leaders of successful and over-subscribed schools that expand. The funding formula should also be individualised further and differentiated more thoroughly to take into account that some pupils are more expensive to teach than others. It would also be preferable to move towards a national funding formula to ensure that people are not disadvantaged because they live in certain areas. Technically, it would be possible to introduce a specific weight on the funding in order to incentivise more heterogeneous schools, but it is important to understand that this might have unintended consequences on efficiency and equity. Finally, an improved information system would be likely to stimulate equity further.

Since we do not know the exact design of the reforms, it would be good to allow experiments in certain regions before implementing a full-blown national policy. This would also facilitate scientific evaluation of the reforms to ensure that they are actually working. If experiments are not possible, the reforms should at the very least be gradually implemented across different regions in a randomised fashion to ensure that they can be evaluated scientifically. In the case that the design turns out to be dysfunctional, the reforms could then be fine-tuned afterwards. In this way, we can move closer towards a system of school choice that increases efficiency, integration, and equity.

References

Åman, Johannes. 2011. "Att lära av de bästa – en ESO-rapport om svensk skola i ett internationellt forskningsperspektiv." Rapport till Expertgruppen för studier i offentlig ekonomi 2011:8 , Finansdepartementet, Stockholm.

Adams, Richard. 2013. "George Osborne promises national funding formula for schools." *The Guardian*, June 26, pp. Online. Available at: <http://www.theguardian.com/education/2013/jun/26/george-osborne-funding-formula-schools> (accessed 23-08-2013).

Ahlin, Åsa. 2003. "Does School Competition Matter? Effects of a Large-Scale School Choice Reform on Student Performance." Working Paper, Department of Economics, Uppsala University, Uppsala.

Alegre, Miquel Á. and Gerard Ferrer. 2010. "School regimes and education equity: some insights based on PISA 2006." *British Educational Research Journal* 36(3):433-461.

Allegre, Miquel Á. and Gerard Ferrer. 2010. "School regimes and education equity: some insights based on PISA 2006." *British Educational Research Journal* 36(3):433-461.

Allen, Rebecca. 2007. "Allocating Pupils to Their Nearest Secondary School: The Consequences for Social and Ability Stratification." *Urban Studies* 44(4):751-770.

Allen, Rebecca, Simon Burgess, and Tomas Key. 2010. "Choosing secondary school by moving house: school quality and the formation of neighbourhoods." Working Paper No. 10/238, Centre for Market and Public Organisation, Bristol University, Bristol.

Allen, Rebecca, Simon Burgess, and Leigh McKenna. 2013. "The short-run impact of using lotteries for school admissions: early results from Brighton and Hove's reforms." *Transactions of the Institute of British Geographers* 38(1):149-166.

Allen, Rebecca and Anna Vignoles. 2007. "What should an index of school segregation measure?" *Oxford Review of Education* 33(5):643-668.

Allen, Rebecca and Anna Vignoles. 2009. "Can school competition improve standards? The case of faith schools in England." DoQSS Working Paper No. 0904, Department of Quantitative Social Science, Institute of Education, London.

Amermueller, Andreas. 2012. "Institutional Features of Schooling Systems and Educational Inequality: Cross-Country Evidence From PIRLS and PISA." *German Economic Review* Doi: 10.1111/j.1468-0475.2012.00565.x.

Angrist, Joshua D., Susan M. Dynarski, Thomas J. Kane, Parag A. Pathak, and Christopher R. Walters. 2010. "Inputs and Impacts in Charter Schools: KIPP

Lynn." *American Economic Review* 100(2):239-243.

Böhlmark, Anders and Helena Holmlund. 2011. "20 år med förändringar i skolan: Vad har hänt med likvärdigheten?" Rapport, Studieförbundet Näringsliv och Samhälle, Stockholm.

Böhlmark, Anders and Mikael Lindahl. 2007. "The Impact of School Choice on Pupil Achievement, Segregation and Costs: Swedish Evidence." Discussion Paper No. 2786, Institute for the Study of Labor, Bonn.

Betts, Julian R. 2011. "The Economics of Tracking in Education." Pp. 341-381 in *Handbook of the Economics of Education*, edited by Eric A Hanushek, Stephen Machin, and Ludger Wößmann. Amsterdam: Elsevier.

Bifulco, Robert, Helen F. Ladd, and Stephen L. Ross. 2009. "Public school choice and integration evidence from Durham, North Carolina." *Social Science Research* 38(1):71-85.

Björklund, Anders, Melissa A. Clark, Per-Anders Edin, Peter Fredriksson, and Alan Krueger. 2005. *The Market Comes to Sweden: An Evaluation of Sweden's Surprising School Reforms*. New York: Russell Sage Foundation.

Bonesrønning, Hans and Linn R. Naper. 2005. "Does competition from private schools raise public schools' performance? New evidence from Norway." Unpublished manuscript, NTNU, Trondheim.

Booker, Kevin, Scott M. Gilpatric, Timothy Gronberg, and Dennis Jansen. 2008. "The effect of charter schools on traditional public school students in Texas: Are children who stay behind left behind?" *Journal of Urban Economics* 64:123-145.

Bradley, Steve and Jim Taylor. 2010. "Diversity, Choice and the Quasi-market: An Empirical Analysis of Secondary Education Policy in England." *Oxford Bulletin of Economics and Statistics* 72(1):1-25.

Brunello, Giorgio and Daniele Checchi. 2007. "Does School Tracking Affect Equality of Opportunity? New International Evidence." *Economic Policy* 22(52):781-861.

Brunner, Eric J., Sung-Whoo Cho, and Randall Reback. 2012. "Mobility, Housing Markets, and Schools: Estimating the Effects of Inter-District Choice Programs." *Journal of Public Economics* 96:604-614.

Buddin, Richard. 2012. "The Impact of Charter Schools on Public and Private School Enrollments." Policy Analysis No. 707, Cato Institute, Washington, DC.
Burgess, Simon and Adam Briggs. 2010. "School assignment, school choice and social mobility." *Economics of Education Review* 29:639-649.

Burgess, Simon, Brendon McConnell, Carol Propper, and Deborah Wilson. 2007. "The Impact of School Choice on Sorting by Ability and Socio-economic Factors in English Secondary Education." Pp. 273-291 in *Schools and the Equal Opportunity Problem*, edited by Ludger Woessman and Paul E Peterson. Cambridge, MA: MIT Press.

Card, David and Jesse Rothstein. 2007. "Racial Segregation and the Black-White

Test Score Gap.” *Journal of Public Economics* 91(11-12):2158-2184.

Chakrabarti, Rajashri. 2008. “Can increasing private school participation and monetary loss in a voucher program affect public school performance? Evidence from Milwaukee.” *Journal of Public Economics* 92:1371-1393.

Chakrabarti, Rajashri. 2013. “Do vouchers lead to sorting under random private school selection? Evidence from the Milwaukee voucher program.” *Economics of Education Review* 34:191-218.

Chingos, Matthew M. 2013. “Does Expanding School Choice Increase Segregation?” *Education Next*, May 16. Available at: <http://educationnext.org/does-expanding-school-choice-increase-segregation/>.

Chowdry, Haroon, Ellen Greaves, and Luke Sibieta. 2010. “The Pupil Premium: Assessing the Options.” IFS Commentary C113, Institute for Fiscal Studies, London.

Chowdry, Haroon and Luke Sibieta. 2011. “School funding reform: an empirical analysis of options for a national funding formula.” IFS Briefing Note BN123, Institute for Fiscal Studies, London.

Coulson, Andrew J. 2011. “The Other Lottery: Are Philanthropists Backing the Best Charter Schools?” Policy Analysis No. 677, Cato Institute, Washington, DC.

de Haan, Monique, Edwin Leuven, and Hessel Oosterbeek. 2011. “Scale Economies Can Offset the Benefits of Competition: Evidence from a School Consolidation Reform in a Universal Voucher System.” Discussion Paper No. 5528, Institute for the Study of Labor, Bonn.

Elacqua, Gregory. 2009. “Parent behavior and yardstick competition: Evidence from Chile’s national voucher program.” Documento de Trabajo CPCE No 2, Centro de Políticas Comparadas de Educación, Universidad Diego Portales, Santiago.

Elacqua, Gregory. 2012. “The impact of school choice and public policy on segregation: Evidence from Chile.” *International Journal of Educational Development* 32:444-453.

Epple, Dennis and Richard Romano. 2012. “Economic Modeling and Analysis of Educational Vouchers.” *Annual Review of Economics* 4:159-183.

Fack, Gabrielle and Julien Grenet. 2010. “When do better schools raise housing prices? Evidence from Paris public and private schools.” *Journal of Public Economics* 94(1-2):59-77.

Fredriksson, Peter and Jonas Vlachos. 2011. “Reformer och resultat: Kommer regeringens utbildningsreformer att ha någon betydelse?” Rapport till Finanspolitiska rådet 2011/3, Stockholm.

Gibbons, Stephen, Stephen Machin, and Olmo Silva. 2013. “Valuing School Quality Using Boundary Discontinuities.” *Journal of Urban Economics* 75:15-28.

Gibbons, Stephen and Shqiponja Telhaj. 2006. “Are Schools Drifting Apart?”

Intake Stratification in English Secondary Schools.” Working Paper, Centre for the Economics of Education, London School of Economics, London.

Goldstein, Harvey and Philip Noden. 2003. “Modelling Social Segregation.” *Oxford Review of Education* 29(2):225-237.

Gorard, Stephen. 2004. “Comments on ‘Modelling social segregation’ by Goldstein and Noden.” *Oxford Review of Education* 30(3):435-440.

Gorard, Stephen, John Fitz, and Chris Taylor. 2001. “School Choice Impacts: What Do We Know?” *Educational Researcher* 30(7):18-23.

Greene, Jay, Tom Loveless, Bentley W. MacLeod, Thomas Nechyba, Paul Peterson, Meredith Rosenthal, and Grover Whitehurst. 2010. “Expanding Choice in Elementary and Secondary Education: A Report on Rethinking the Federal Role in Education.” Brown Center on Education Policy, Brookings Institution, Washington, DC.

Høiseth Brugård, Kaja. 2013. “Does school choice affect student performance and public school quality?” Unpublished Manuscript, Center for Economic Research, Norwegian University of Science and Technology, Trondheim.

Hanhusek, Eric A., Sinan Sarpca, and Kusey Yilmaz. 2011. “B.E. Journal of Economic Analysis & Policy.” *Private Schools and Residential Choices: Accessibility, Mobility, and Welfare* 11(1):Article 44.

Hanushek, Eric A., Ludger Woessmann, and Lei Zhang. 2011. “General Education, Vocational Education, and Labor-Market Outcomes over the Life-Cycle.” NBER Working Paper No. 17504, National Bureau of Economic Research, Cambridge, MA.

Haraldsvik, Marianne. 2012. “Does Performance-Based School Choice Affect Student Achievement?” Unpublished Manuscript, Department of Economics, Norwegian University of Science and Technology, Trondheim.

Hastings, Justine S. and Jeffrey M. Weinstein. 2008. “Information, School Choice, and Academic Achievement: Evidence from Two Experiments.” *Quarterly Journal of Economics* 123(4):1373-1414.

Hoxby, Caroline M. 2000. “Does Competition among Public Schools Benefit Students and Taxpayers?” *American Economic Review* 90(5):1209-1238.

Hoxby, Caroline 2002. “How School Choice Affects the Achievement of Public School Students.” Pp. 141-177 in *Choice with Equity*, edited by Paul T Hill. Stanford, CA: Hoover Institution Press.

Hsieh, Chang-Tai and Miguel Urquiola. 2006. “The effects of generalized school choice on achievement and stratification: Evidence from Chile’s voucher program.” *Journal of Public Economics* 90:1477-1503.

Hussain, Iftikhar. 2013. “Not Just Test Scores: Parents’ Demand Response to School Quality Information.” Unpublished Manuscript, University of Sussex.

Imberman, Scott A. 2011. “The effect of charter schools on achievement and

behavior of public school students.” *Journal of Public Economics* 95(7-8):467-1018.

Jakubowski, Maciej 2010. “Institutional Tracking and Achievement Growth: Exploring Difference-in-Differences Approach to PIRLS, TIMSS, and PISA Data.” Pp. 41-81 in *Quality and Inequality of Education: Cross-National Perspectives*, edited by Japp Dronkers. London: Springer.

Jenkins, Stephen P., John Micklewright, and Sylke V. Schnepf. 2008. “Social segregation in secondary schools: how does England compare with other countries?.” *Oxford Review of Education* 34(1):21-37.

Koedel, Cory, Julian R. Betts, Lorien A. Rice, and Andrew C. Zau. 2009. “The Integrating and Segregating Effects of School Choice.” *Peabody Journal of Education* 84:110-129.

Koerselman, Kristian. 2013. “Incentives from Curriculum Tracking.” 32:140-150.
Ladd, Helen F. 2002. “School Vouchers: A Critical View.” *Journal of Economic Perspectives* 16(4):3-24.

Lindbom, Anders and Ellen Almgren 2007. “Valfrihetens effekter på skolornas elevsammansättning: Skolsegregationen i Sverige.” Pp. 89-118 in *Friskolorna och framtiden – segregation, kostnader och effektivitet*, edited by Anders Lindbom. Stockholm: Institutet för framtidsstudier.

Ludwig, Jens, Greg J. Duncan, Lisa A. Gennetian, Lawrence F. Katz, Ronald C. Kessler, Jeffrey R. Kling, and Lisa Sanbonmatsu. 2012. “Neighborhood Effects on the Long-Term Well-Being of Low-Income Adults.” *Science* 337(6101):1505-1510.

Ludwig, Jens, Lisa Sanbonmatsu, Lisa Gennetian, Emma Adam, Greg J. Duncan, Lawrence F. Katz, Ronald C. Kessler, Jeffrey R. Kling, Stacy Lindau Tessler, Robert C. Whitaker, and Thomas W. McDade. 2011. “Neighborhoods, Obesity, and Diabetes- A Randomized Social Experiment.” *New England Journal of Medicine* 365:1509-1519.

Machin, Stephen and Kjell Salvanes. 2010. “Valuing School Quality Via School Choice Reform.” Working Paper, Centre for the Economics of Education, London School of Economics, London.

Machin, Stephen and Olmo Silva 2013. “School Structure, School Autonomy and The Tail.” in *The Tail- How England’s Schools Faile One in Five and What Can be Done*, edited by Paul Marshall. London: Profile Books.

MacLeod, Bentley W. and Miguel Urquiola. 2012. “Anti-Lemons: School Reputation, Relative Diversity, and Educational Quality.” Discussion Paper No. 6805, Institute for the Study of Labor, Bonn.

Makles, Anna and Kerstin Schneider. 2011. “Segregation in primary schools – Do school districts really matter? Evidence from policy reforms.” Schumpeter Discussion Paper 2011-003, Schumpeter School of Business and Economics, University of Wuppertal, Wuppertal.

-
- Malamud, Ofer and Christian Pop-Eleches. 2011. "School Tracking and Access to Higher Education Among Disadvantaged Groups." *Journal of Public Economics* 95:1538-1549.
- Neal, Derek. 2002. "How Vouchers Could Change the Market for Education." *Journal of Economic Perspectives* 16(4):25-44.
- Nguyen-Hoang, Phuong and John Yinger. 2011. "The Capitalization of School Quality into House Values: A Review." *Journal of Housing Economics* 20:30-48.
- Niepel, Verena. 2012. "Essays on Skills, School Choice, and Their Long-Term Consequences." PhD Dissertation, Universität Mannheim, Mannheim.
- Nordström Skans, Oskar and Olof Åslund. 2010. "Etnisk segregation i storstäderna- bostadsområden, arbetsplatser, skolor och familjebildning 1985-2006." Report 2010:4, Institutet för arbetsmarknadspolitisk utvärdering (IFAU), Uppsala.
- Östh, John, Eva Andersson, and Bo Malmberg. 2012. "School Choice and Increasing Performance Difference: A Counterfactual Approach." *Urban Studies* Doi: 10.1177/0042098012452322.
- Raitano, Michele and Francesco Vona. 2010. "Peer Heterogeneity, Parental Background and Tracking: Evidence from PISA 2006." Working Paper No. 2010-23, OFCE- Centre de recherche en économie de Sciences Po, Paris.
- Raitano, Michele and Francesco Vona. 2011. "Assessing Students' Equality of Opportunity in OECD Countries: The Role of National and School-Level Policies." OFCE Working Paper .
- Rangvid, Beatrice S. 2010. "School Choice, Universal Vouchers and Native Flight from Local Schools." *European Sociological Review* 26(3):319-335.
- Söderström, Martin and Roope Uusitalo. 2010. "School Choice and Segregation: Evidence from an Admission Reform." *Scandinavian Journal of Economics* 112(1):55-76.
- Sacerdote, Bruce 2011. "Peer Effects in Education: How Might They Work, How Big Are They and How Much Do We Know Thus Far?" Pp. 249-277 in *Handbook of the Economics of Education*. Amsterdam: Elsevier/North-Holland.
- Sahlgren, Gabriel H. 2013. *Incentivising Excellence: School Choice and Education Quality*. London: Centre for Market Reform of Education and Institute of Economic Affairs.
- Sahlgren, Gabriel H. forthcoming. "Incentives in Education." CMRE Research Paper, Centre for Market Reform of Education, London.
- Sandström, Mikael F. and Fredrik Bergström. 2005. "School Vouchers in Practice: Competition Will Not Hurt You." *Journal of Public Economics* 89:351-380.
- Schneider, Mark, Gregory Elacqua, and Jack Buckley. 2006. "School Choice in Chile: Is it Class or the Classroom?" *Journal of Policy Analysis and Management* 25(3):577-601.
-

- Schneider, Kerstin, Claudia Schuchart, Horst Weishaupt, and Andrea Riedel. 2012. "The effect of free primary school choice on ethnic groups — Evidence from a policy reform." *European Journal of Political Economy* 28(4):430-444.
- Schutz, Gabriela, Elke Ludemann, Martin R. West, and Ludger Woessmann. 2007. "School Accountability, Autonomy, Choice, and the Equity of Student Achievement: International Evidence from PISA 2003." Education Working Paper No. 14, Directorate for Education, OECD, Paris.
- Schutz, Gabriela, Heinrich W. Ursprung, and Ludger Woessmann. 2008. "Education Policy and Equality of Opportunity." *Kyklos* 61(2):279-308.
- Sibieta, Luke, Haroon Chowdry, and Alastair Muriel. 2008. "Level Playing Field? The Implications of School Funding." Research Paper, CfBT Education Trust, London.
- Song, Yong S. 2012. "Educational Tracking, Residential Sorting, and Intergenerational Mobility." Working Paper, Department of Economics, Williams College, Williamstown, MA.
- Teske, Paul, Jody Fitzpatrick, and Tracey O'Brien. 2009. "Drivers of Choice: Parents, Transportation, and School Choice." Center on Reinventing Public Education, University of Washington, Seattle, WA.
- Waldinger, Fabian. 2007. "Does Ability Tracking Exacerbate the Role of Family Background for Students' Test Scores?" Unpublished Manuscript, Department of Economics, University of Warwick, Coventry.
- Walsh, Patrick. 2009. "Effects of School Choice on the Margin: The Cream is Already Skimmed." *Economics of Education Review* 28:227-236.
- Winters, Marcus A. 2012. "Measuring the effect of charter schools on public school student achievement in an urban environment: Evidence from New York City." *Economics of Education Review* 31:293-301.
- Vlachos, Jonas. 2010. "Betygets värde- En analys av hur konkurrens påverkar betygssättningen vid svenska skolor." Uppdragsforskningsrapport: 2010:6, Konkurrensverket, Stockholm.
- Vlachos, Jonas. 2012. "Är vinst och konkurrens en bra modell för skolan?" *Ekonomisk Debatt* 40(4):16-30.
- Woessmann, Ludger. 2007. "Fundamental Determinants of School Efficiency and Equity: German States as a Microcosm for OECD Countries." Discussion Paper No. 2880, Institute for the Study of Labor, Bonn.
- Zimmer, Ron, Brian Gill, Kevin Booker, Stéphane Lavertu, and John Witte. 2009. "Do Charter Schools 'Cream Skim' Students and Increase Racial-Ethnic Segregation?" Working Paper, National Center on School Choice, Vanderbilt University, Nashville, TN.
-



**CENTRE FOR MARKET
REFORM OF EDUCATION**

2 Lord North Street, London, SW1P 3LB

020 7799 8903

www.cmre.org.uk

info@cmre.org.uk