## THE CENTRE FOR MARKET AND PUBLIC ORGANISATION

The Centre for Market and Public Organisation (CMPO) is a leading research centre, combining expertise in economics, geography and law. Our objective is to study the intersection between the public and private sectors of the economy, and in particular to understand the right way to organise and deliver public services. The Centre aims to develop research, contribute to the public debate and inform policy-making.

CMPO, now an ESRC Research Centre was established in 1998 with two large grants from The Leverhulme Trust. In 2004 we were awarded ESRC Research Centre status, and CMPO now combines core funding from both the ESRC and the Trust.

Centre for Market and Public Organisation
Bristol Institute of Public Affairs
University of Bristol
2 Priory Road
Bristol BS8 1TX
http://www.bris.ac.uk/Depts/CMPO/

*Tel: (0117) 33 10799*
*Fax: (0117) 33 10705*
*E-mail: cmpo-office@bristol.ac.uk*

# The Formation of School Peer Groups: Pupils' Transition from Primary to Secondary School in England

Simon Burgess, Ron Johnston, Tomas Key,
Carol Propper and Deborah Wilson

February 2007

Working Paper No. 07/172

ISSN 1473-625X

**CMPO Working Paper Series No. 07/172**

# The Formation of School Peer Groups: Pupils' Transition from Primary to Secondary School in England

Simon Burgess[1], Ron Johnston[2], Tomas Key[3], Carol Propper[1] and Deborah Wilson[3]

*[1]CMPO and Department of Economics, University of Bristol*
*[2] Geographical Sciences and CMPO, University of Bristol*
*[3] CMPO, University of Bristol*

February 2007

## Abstract
This paper examines the transitions from primary to secondary school for a contemporary cohort of children moving between state schools in England. It uses data on over 12,000 primary schools, over 2000 secondary schools and around 400,000 pupils. The results suggest that the experiences of poor (FSM) pupils at age 11 may be quite different, on average, to their non-poor peers. Poor pupils' primary peer groups are more fractured at the age of 11 and these pupils tend to find themselves more concentrated within lower performing secondary schools. High ability pupils are more likely to go to the modal secondary school if it is better than average; the reverse is true for low ability pupils. Poor pupils are less likely to go to the modal school when it is better than average but more likely to go when it is worse. Finally, we find that primary schools which have high academic test scores have more bifurcated flows: poor and non-poor pupils are dispersed across different secondary schools, with the former more likely to attend a low performing secondary school.

**Keywords:** Primary to secondary school transitions; England; regression and graphical analysis

**JEL Classification:** I21

**Electronic version:** **http://www.bris.ac.uk/Depts/CMPO/workingpapers/wp172.pdf**

**Address for Correspondence**
CMPO, Bristol Institute of Public Affairs
University of Bristol
2 Priory Road
Bristol
BS8 1TX
Simon.burgess@bristol.ac.uk
www.bris.ac.uk/Depts/CMPO/

**CMPO** is jointly funded by the Leverhulme Trust and the ESRC

## Introduction

School peer groups are widely thought to be important in moulding children's development. In particular, a potential role for peer groups features prominently in analyses of educational attainment and behaviour in school. Less is known about the formation of peer groups, however. Clearly, this is complex and in this paper we focus on one component of this process. The transition of pupils from primary to secondary school involves the dispersal of primary school peer groups, the re-sorting of pupils, and the formation of secondary school year groups. School year groups are bigger than micro peer or friendship groups[1], but they provide the pool from which the new micro peer groups are formed. Analysing the dispersal and re-formation of these groups is a necessary first step to a better understanding of school peer groups.

Our analysis uses a national (England) census of all pupils in state schools. We track one cohort of approximately half a million pupils as they make the transition from primary to secondary school. We characterise the origin schools, destination schools and pupils themselves in terms of poverty status and educational attainment. We first simply quantify the degree of fragmentation and dispersal of year groups. We then compare the characteristics of origin and destination schools across typical transitions. Switching the focus to individual pupils, we ask which pupils follow the modal path from a primary school and which do not, depending on their personal characteristics. Finally, we evaluate the degree of bifurcation of the school transition flows: to what extent do poor and non-poor children go their different ways on leaving primary school.

The flows that we observe are the end result of the various processes that make up the current system of school choice in England. According to the rhetoric, parents and students should be able to exercise choice at all levels of the educational system, enabling them to opt for their preferred provider and, in part by stimulating inter-school competition, improving the overall quality of provision. Such choice has been available in the English school system since the 1944 Education Act, but its importance has increased very substantially since the Educational Reform Act 1988, and extended thereafter (White et al, 2001). The recent education Act (2006) introduced a new Schools Admissions Code for those making admissions decisions, the governing bodies of self-governing schools and LEAs.[2] Criteria such as parental occupation, income or marital status cannot be taken into account where a school is over-subscribed, nor must they interview applicants and use 'first preferences', nor should criteria be set – like the wearing of a school uniform – that would

[1] Though operationally, quite big groups are often used.
[2] The Code is available at http://www.dfes.gov.uk/sacode/docs/FinalSACode08Jan2007.doc.

discriminate against students from particular backgrounds. Under the Code, it is quite proper for a school to have a defined catchment area and give priority to students living within that area when deciding which applicants to accept if it is over-subscribed, but a place cannot be guaranteed to every student living within that area.[3] ‘Faith schools’ are allowed to use religious criteria if over-subscribed but cannot otherwise discriminate on religious grounds.

The strengthening of choice and the development of admissions procedures by LEAs and individual schools have stimulated a great deal of research, focussed mainly on three issues. First, the impact of school choice on the efficiency of schools has been evaluated. Results in Clark (2004), Gibbons, Machin and Silva (2006) and Burgess and Slater (2006) all suggest that this effect is limited at best. Second, researchers have examined the impact of choice on social segregation or sorting of pupils. This literature includes controversies about methods and measurements as well as results. Gorard et al (2003) and Allen and Vignoles (2007) debate changes in segregation over the 1990s. Burgess, McConnell, Propper and Wilson (2007) examine segregation in detail using recent data and characterise variations over space. Burgess and Briggs (2006) examine whether children from poor families have lower chances of attending ‘good’ schools[4]. Third, case studies such as in Ball and Vincent (1998) and Reay and Ball (1998), consider the sources of information used in parental choice, and a series of papers by Reay and Lucey (2000a, 2000b, 2003) examine students’ roles in decision-making on the transition from primary to secondary schools. Others have considered the role of ethnicity as a criterion in LEAs with large multi-ethnic populations (Bagley, 1996; Reay and Lucey, 2000a; Lucey and Reay, 2002).

The degree of fragmentation of streams of students experiencing the transition from primary to secondary schools, and variations across LEAs in that fragmentation, may be of considerable importance in a variety of ways. It may, as already noted, result in considerable social segregation among secondary schools, with potential implications for social integration. Alongside these concerns over social integration are others relating to educational performance. If parents use information on the ‘quality’ of various schools – using the data on exam performance published by the DfES and manipulated into league tables by the media, for example – the result may be segregation not only by ability but also by aspiration, so inducing considerable variation in school performance. Some students may benefit from gaining access to ‘better performing’ schools but

[3] The acceptability of a catchment area was determined in the case of *R v Rotherham Metropolitan Council ex parte Clark and others* (1997): EWCA Civ 2768. For Birmingham, the admissions information for each secondary school indicates the distance from the school travelled by the ‘last student admitted’: http://www.bgfl.org/services/secondary/files/Q31218a_SecondaryDirect07.pdf.

[4] An assessment of the economic evidence supporting choice is provided in Burgess, Propper and Wilson (forthcoming).

others will be disadvantaged, either by failing to gain access to them or by the ‘quality’ of the schools they have selected, perhaps on other criteria [5].

Our concern here is on the transition from primary to secondary school and the extent to which this is patterned by pupil ability and poverty status and the nature of the schools attended. It is difficult to develop specific hypotheses regarding the degree of current fragmentation of the primary-to-secondary transition in the English school system. We anticipate that it will be considerable, based on general appreciation of the geography of school attendance. For example, recent studies using the data employed in this paper have shown that most English students have considerable choice of secondary schools within a relatively short distance from their home (Burgess, Briggs, McConnell and Slater, 2006). Perhaps not surprisingly, therefore, most secondary students in urban areas do not attend their nearest school: only 24 per cent in London, and 43 per cent in other urban areas; the figure for rural areas is 57 per cent (Burgess, Briggs, McConnell and Slater, 2006). If ‘quality’ is a strong influence on choice, secondary schools appearing high on the league tables for their LEAs might draw students from a wider range of primary schools – i.e. have a more fragmented intake – than those occupying lower positions. (A recent study of six London LEAs – Butler et al, 2007 – shows that high-performing secondary schools draw students from wider catchment areas.) Similarly, if the parental choice criterion is a school’s social composition, secondary schools with higher status populations might draw from a wider range of primary schools – again, have more fragmented entry cohorts – than those of a predominantly lower perceived status. Complementing this patterning, primary schools may have more fragmented cohorts leaving them – i.e. going to a wider range of secondary schools – if either some of their students perform well at the standardised tests taken at age 11 or their student population includes a proportion from relatively affluent backgrounds. Schools with predominantly poorly performing students from lower socio-economic backgrounds may see most of them going to only one or a few nearby secondary schools.

## 2. Data

Our core dataset is the Pupil Level Annual School Census (PLASC), provided by the Department for Education and Skills (DfES). This is a census of all children in state schools in England, taken each year in January. PLASC provides a number of personal characteristics, and can also be linked

[5] From an analysis of intake cohorts to secondary schools between 1996 and 2002, Gibbons and Telhaj (2006) found no evidence that this is producing a growing gap between ‘high’ and ‘low’ performing schools. If anything, they find a greater diversity in student performance within secondary schools – although this is only a minor shift in a system with consistent variations across schools in their students’ performance.

to other items from the DfES's National Pupil Database (NPD), including each pupil's Key Stage (partial) test score history and school-level data.

(a) Available data

Data on pupils includes the following characteristics: gender, within-year age, ethnicity, and an indicator of Special Educational Needs (SEN, which measures learning or behavioural difficulties). A key variable for our analysis is an indicator of family poverty, eligibility for Free School Meals (FSM). This is dependent on receipt of state welfare benefits: parental eligibility for Income Support brings eligibility for FSM. Income Support largely captures single parents but also includes support for disability. Measurement error may be an issue: our FSM variable is probably a very good measure of the FSM status of children[6], though the FSM variable is a noisy measure of poverty status[7]. The proportion of children eligible for FSM is less than the proportion counted as poor using standard measures, so FSM children are likely to be poorer than the average poor child.

There are 4 Key Stage tests that pupils sit during compulsory education, at the ages of 7, 11, 14 and 16. The school level average exam scores reflect both the teaching of the school (value added) and the composition of the school (peer group). In our analysis, we use results from the Key Stage 2 (KS2) test to characterise primary school quality, and results from the KS3 test to characterise secondary school quality. The KS2 and KS3 tests are both nationally set groups of tests (in English, Maths and Science), marked outside the school. In terms of timing, the KS2 mean score is always for the cohort of pupils we follow. To avoid simple longitudinal linkages in the data (not what we want to pick up), the KS3 mean used to characterise secondary schools is the average of the mean KS3 scores for 2001/2/3. We also have additional data on school characteristics: religious denomination (if any); funding-type; selection policy; whether the school is single-sex; and whether the school is in a rural or urban area.

(b) Sample Selection

The paper analyses pupils transiting from primary school (PS) to secondary school (SS) at age 11, and we select an analysis sub-sample to focus on this education stage. We extract a cohort of pupils who took their KS2 tests in 2001 and their KS3 exams in 2004. We link three PLASCs to capture the schools attended by these pupils. The cohort transferred from primary to secondary school

[6] See http://www.bris.ac.uk/Depts/CMPO/PLUG/userguide/anna.ppt for a discussion of the multi-stage checking of the schools' data.

[7] For some evidence, see http://www.bris.ac.uk/Depts/CMPO/PLUG/events/130906/vignoles.ppt

following their KS2 exams in 2001. For time-varying variables such as FSM status, we use the value for the student from PLASC 2002, their first year in SS.

In the following analysis we focus solely on state school pupils, accounting for around 93% of all pupils (data are not available for students at private schools). We also choose to omit pupils attending schools in selective Local Education Authorities (LEA). We define a selective LEA as one in which more than 10% of pupils attend a school which selects all of its pupils on the basis of their ability. There are 18 selective LEAs in England out of a total of 150, accounting for 13% of pupils in our cohort.

Some LEAs in England operate a 'middle schools' policy whereby pupils make two transfers, between lower, middle and upper schools at ages 9 and 13 respectively. We omit these schools from this analysis: roughly 9% of pupils in non-selective LEAs attend middle schools. Also a very small number of pupils who attend a primary school until the age of 12 are dropped. We also omit special schools, as well as other academic centres such as hospital schools and detention centres, from our dataset. Finally, we discard pupils with missing data. This leaves us with a sample of 412,793 pupils used in the regressions of Table 6, some 86% of the available total in non-selective LEAs. Our sample has 12367 primary schools and 2517 secondary schools.

## 3. Results

We examine four linked components of the transitions between primary and secondary school. We begin with an examination at school level. We look first at primary school outflows and secondary school intakes separately, examining the degree of dispersal of primary school (PS) pupils as they move on to secondary school (SS) and the degree of fragmentation of the intake cohort into SS. Second, we undertake an analysis of the link between schools analysing the most popular (the modal) SS destination for each PS and comparing the characteristics of these linked schools in terms of mean test scores and proportions of poor pupils. Third, we move to a pupil level analysis, and ask which pupils follow the modal path for their PS and which pupils go elsewhere. Our focus is on differences between pupils according to their ability and their free school meal status. Finally, we analyse the extent to which the individual pupil PS to SS flows bifurcate in terms of poverty, with poor and non-poor children from the same PS going to different SSs.

(a) Dispersal and Fragmentation

This first section of analysis examines the flow of pupils from primary school (PS) to secondary school (SS) at a school level. We examine two different measures of the destinations and origins of pupils. The first is simply a count of the number of SSs that a PS sends to. Similarly for the SS intake we count the number of PSs that a SS derives its pupils from. Our second measure is analogous to a market share variable, and controls for school size, which the count measure does not. For analysis of PS destinations, we calculate the percentage of the PS cohort that attends each SS, squaring these percentages, and then summing them for each PS. The measure will decrease with increasing cohort dispersion, with a maximum value of 10,000 if all pupils move to the same SS. The measure for the SS intake analysis is similarly generated[8].

Table 1 presents summary statistics. On average, a PS sends pupils to just under 5 schools. About 25 per cent of schools send to 1 or 2, and 25 per cent send to 6 or more. Cohorts are most widely dispersed in London LEAs, where the average number of destinations is just under 10, and least in rural LEAs, where the average is just under 3. The degree of dispersal is also correlated with the KS2 score of the PS and the fraction of poor pupils in the PS. The mean sum of squares measure confirms these results when correcting for school size. Dispersion is greater in urban areas, greater from poor schools, and slightly greater from low-scoring PSs.

These are bivariate correlations and as location, poverty and test performance are correlated we present a multivariate description of the data in Table 2. Regression (i) uses the count variable of PS dispersion. The results indicate that, perhaps not surprisingly, cohorts from urban primary schools are more widely dispersed than their rural counterparts. Holding location constant, pupils originating from PSs with a higher proportion of FSM children are more widely dispersed than their peers from richer schools. The KS2 score of a PS, once we control for these other factors, is no longer significantly correlated with the degree of dispersion. As we would expect, the size of the PS is also positive and significant: bigger PSs send to a greater number of SSs. Regression (ii) uses the sum of squares measure of cohort dispersion. The results are consistent with those from (i), other than for size, which is here negatively related to cohort dispersion. Once we use a measure that controls for size, large PSs send to fewer SSs than smaller ones.

Table 3 shows the extent of the fragmentation of an SS's intake. The average number of PSs contributing to an SS intake is just under 24. This is highest in London (37 PSs), followed by other

[8] Secondary schools are much larger – averaging 970 students – than primary schools, most of which take students for six years from 5-11, and average 240 students. Secondary school intakes are therefore likely to be more fragmented – i.e. spread across more primary schools – than are the flows out of primary schools.

urban areas (23), and rural LEAs (20). Better secondary schools, in terms of average KS3 score, have a more fragmented intake. In this bivariate analysis, there does not appear to be any clear association of fragmentation and the proportion of FSM pupils in the SS. Table 4 presents the multivariate description, also controlling for LEA dummies and other SS characteristics[9]. The dependent variable in regression (i) is the count of the PSs from which the SS derives its pupils. Secondary schools which have better exam performance and those which have a higher percentage of poor students have a more fragmented intake. The urban location dummy has an insignificant coefficient (probably because of collinearity between that variable and school size). The bigger the school the more fragmented the intake. Regression (ii) uses the sum of squares measure as the dependent variable. The results are consistent with those from the first regression.

The outflows and inflows can be shown in a network-type figure. Figure 1 takes one urban LEA and shows all the (state) PSs and SSs in the LEA and the flows between them[10]. The squares represent SSs and the circles PSs; filled shapes indicate schools in the top third of their respective distribution of test scores; and the thickness of the line joining a PS to an SS shows that flow as a proportion of the PS's cohort. Note that the Figure has no spatial interpretation at all – schools in the north-east of the figure are not necessarily in the north-east of the LEA, and schools close to one another in the diagram are not necessarily close in reality. The software[11] simply arranges the units on the page in the clearest way.

The overwhelming impression from the figure is of a very complex system. There are no sets of PSs and associated SS that are isolated, in terms of flows, from the rest. Several parts of the figure show extremely dense inter-relationships; for example, the centre lower part of the figure. It is clear that some SSs receive pupils from very many PSs: an example is the filled in square (a better performing secondary school) in the centre of the picture, which receives a small proportion of many primary schools' outflows. The graph also gives a sense that the filled squares (better secondary schools) link to more PSs than the blank squares, which fits with the results from table 4 which show that better secondary schools have a more fragmented intake than ones lower down the LEA ranking in terms of KS3 score. It is also very clear from the figure that this LEA is not at all like a simple "feeder school" system. And this complexity is not just restricted to this LEA: many urban LEA show a similarly complex pattern[12].

[9] Roman Catholic and Church of England schools have a more fragmented intake than 'non-faith' schools; minority faith schools have a less fragmented intake.
[10] The number of flows outside this LEA are extremely small.
[11] NetDraw 2.41
[12] The LEA pictured here contains 20 secondary school and 95 primary schools

Figure 2 portrays the same information for a predominantly rural LEA. In this case, while again there are no completely detached clusters, the graph is clearly much less connected overall. A lot of PSs only send to one SS, and one SS only takes in pupils from four PSs. This reflects rurality and again shows what the multivariate analyses of all schools find – that children from primary schools in urban locations are more widely dispersed. However, even in a rural LEA, there is a cluster of schools with much denser connections that arise in a more urban part of the LEA.

(b) Comparing PS and destination SS characteristics

Since each PS sends pupils to many SSs, it is not straightforward to characterise the relationship between the linked schools. We first examine the whole distribution of SSs that a PS sends to, and then single out the most popular (the modal) SS destination for each PS and focus on that. Given the nature of pupil dispersal, for some schools the modal SS could be clearly dominant, in other cases only marginally so, and in many cases will account for less than half of all pupils.

Figures 3 to 5 present quantile plots that show the distribution of types of secondary school that different primary schools send their pupils to. Figure 3 plots the KS2 mean of the origin PS against the average of the KS3 mean of the SSs that it sends to. The quantile plot shows a clear upward trend: PSs with higher average KS2 scores send their pupils to SSs with higher KS3 scores. The extent of dispersion around the median is relatively small. The 90/10 range of destination SS scores for the PSs in the bottom 5% is 29 – 35, compared to 34 – 38 for the highest scoring 5% of PSs.

Figure 4 presents the relationship between the percentage of FSM pupils at a PS, and the average percentage of FSM pupils at the SSs it sends to. The quantile plot displays a relationship that is both non-linear and that has a widening distribution. There is no strong relationship between the FSM status of the primary school and the secondary schools to which it sends its pupils for those primary schools in the bottom half of the FSM distribution. However, for primary schools in the top part of the primary school distribution of FSM children the picture is rather different. These schools send to secondary schools with a high proportion of FSM children. At the very top end, some PSs with high proportions of FSM children send to SS destinations which have very high proportions of such children and few other primary schools send their pupils to such schools.

Figure 5 presents the relationship between the percentage of FSM pupils a PS has and the average KS3 score of the SSs it sends to. The plot displays a linear relationship between these two school characteristics, and also a similar level of dispersion at all points in the distribution. It confirms that PSs with poorer pupils send to lower performing SSs[13].

Turning to the analysis of the modal SS (M-SS) destination for each PS, Figure 6 plots the score of the modal secondary school relative to its LEA average, against quantiles of the KS2 performance of the PS. The vertical axis shows percentiles of the difference between the M-SS KS3 mean and the LEA average KS3 mean. The graph is linear and increasing. Low scoring PSs have modal destinations that are below the LEA average, while high scoring PSs have modal destinations above the average. The dispersion is constant. Similarly, Figure 7 plots the score of the M-SS against quantiles of percentage FSM pupils of the PS. The graph is linear (after the first 4 quantiles which all have no FSM pupils) and decreasing: 'richer' PSs have modal destinations that are above the LEA average.

Table 5 confirms these results in a multivariate context. The unit of analysis is a PS and the dependent variable is 1 if the score of its M-SS exceeds the LEA average and 0 otherwise. The results show that the probability of having a better than average modal destination is increasing in the KS2 score of the PS, but is decreasing in the proportion of FSM pupils. The coefficient on the urban dummy is negative so urban primary schools are less likely to have a modal destination that is above the LEA average KS3 performance[14].

In summary, this analysis at school level has shown that there are systematic differences in the destinations that primary schools send to according to type of pupils in these schools. For example, primary schools with a higher percentage of FSM pupils are more likely to disperse these children across a larger number of secondary school. Primary schools that have better test scores send children to secondary schools with better test scores. Primary schools with more FSM children are more likely to have flows out to secondary schools which have more FSM children and to send children out to poorer performing schools in terms of academic test scores. Put another way, the ability and poverty status of children in a PS is related to the number and type of pupils in the SSs that the children of that school go to.

(c) Modal path and off-modal-path flows

[13] The quantile plots were repeated to examine the relationship between the characteristics of the PS and those of its most popular destination SS. These show very similar patterns discussed to those for all schools, so are not shown here.
[14] The modal SS for an urban primary school is better than all the other schools to which it sends pupils to. This is not the case for rural primary schools.

The school level analysis suggests that the experiences of similar pupils from different school types will differ. In this section we look at the experience of individual pupils, in particular focusing on whether the characteristics of the average pupil in a PS are correlated with the flows of individual pupils, after controlling for their own characteristics.

We first analyse whether pupils make the modal transition for their PS, then distinguish between whether it is a better transition than the alternatives or a worse one. The results are presented in tables 6 and 7. Column (i) of Table 6 examines the relationships between pupil poverty status and KS2 scores and school characteristics and the probability of following the modal path. The coefficients show the marginal effect of a change of each variable on the probability. The results show that pupils who are poor and pupils who are more able are both less likely to follow the modal path from their PS. On top of this, pupils from high scoring PSs are more likely to follow the modal path, whilst those from PSs with the most FSM pupils are less likely to do so. The next two columns allow for interactions between pupil and school characteristics (specification ii) and for LEA fixed effects (specification iii). The interactions produce lower main effects for pupil FSM but significant interaction terms in pupil FSM. Calculated probabilities using the estimates of the last column show that where the primary school has a higher proportion of free school meal children, the poor children in that school are about 1% more likely to follow the modal path than their non-poor peers.

Table 7 examines the probability that a pupil attends the modal SS, splitting the modal school in terms of whether it was above or below the LEA average on KS3 performance. In the left hand specifications – columns (i) and (ii) - the modal school is a less well performing school relative to the LEA average. In the right hand specifications – columns (iii) and (iv) - it is a higher performing school. We see some striking differences across children and school types. The results show that FSM pupils are more likely to go to the modal school when it is low scoring, but less likely when it is high scoring. The opposite is true for a pupil's ability. On the other hand, children from a high performing PS are more likely to attend the modal SS, regardless of whether it is better or worse than the average secondary school. This is consistent with the earlier findings (Table 2) that poor performing schools send to more destinations. Similarly, attendance at a PS with the most FSM pupils always has a negative impact on the chance of moving along the modal path; again a finding that we saw in the school level analysis.

Using the estimated coefficients from specification (ii) to look at the chances of taking the modal path to a low performing secondary school, a poor child is always more likely to attend the modal school when it is low performing than a non-poor child. However, when the origin primary school is academically good, the chance that the FSM child will take the modal path to the low scoring secondary school is about 5 percentage points higher than that of the non-FSM child. But when the origin primary school is not academically good the chance is only 2 percentage points higher. Put another way, non-poor children who attend good primary schools have a better chance of escaping the modal flow when this flow is to a poorly performing secondary school. Using the estimated coefficients from specification (iv) to look at the chances of making the modal transition where it is to a good school, FSM children are 4 to 5 percentage points less likely to take this path than their non-FSM peers. This gap does not vary that much by characteristics of primary school.

(d) Bifurcation by poverty status

These results suggest that poor and non-poor children often follow different paths in their transitions between primary and secondary school. We focus on this in this final section of results. First, we present a network-type diagram. Figure 8 shows the flows out of the PSs in the urban LEA along which a significantly greater proportion (10 percentage points more) of the PS's FSM pupils travel than its non-FSM pupils. We mark a flow in this figure if *x*% of a PS's poor pupils flow to a particular SS and fewer than (*x-10*)% of its non-poor pupils flow there. In other words, we mark a flow when the relative odds of a poor pupil making this transition are at least 10 percentage points higher than the odds of a non-poor pupil making the transition. Conversely, in Figure 9 we mark the flows with disproportionately more non-poor pupils. Because of these definitions, a PS (if connected) will necessarily link to different SSs in the two figures.

A visual comparison of the two figures shows that in the urban LEA in Figure 8, where the flows that are those taken disproportionately by poor children, the most common destination SS is a lower-scoring one. In contrast, in Figure 9, where the flows are those taken disproportionately by richer children, more of the flows are into high-scoring SSs. Figures 10 and 11 repeat this exercise for the rural LEA. Overall, poverty levels there are lower, so there are fewer links altogether in Figure 10. Again, however, more of the connections are into low-scoring schools in the excess-poor flows and more into high-scoring schools in the excess-non-poor flows. So in both settings, the paths which poor children take, compared to their richer peers in the *same* schools, are those to the less good schools.

Finally, we quantify the degree of bifurcation of the pupil flows out of PS by poverty status. To be precise, we ask what proportion of a PS's poor pupils go to schools to which it sends no non-poor pupils, and what proportion of its non-poor pupils go to schools to which it sends no poor pupils. The index $B$ is computed for school $i$ as:

$$B_i = \frac{P_i^B + NP_i^B}{S_i} = \left(\frac{P_i^B}{P_i}\right) p_i + \left(\frac{NP_i^B}{NP_i}\right)(1 - p_i)$$

where $P_i^B$ is the number of poor pupils moving to an SS with only other poor peers, $NP_i^B$ is the number of non-poor pupils moving to an SS with only other non-poor peers, $S_i$ is the total size of the exiting cohort in school $i$, $P_i$ is the number of poor pupils, and $p_i = P_i/S_i$. Note that the measure makes sense only for schools that have both types of pupil, and we only report it for such pupils below. A high value indicates high bifurcation – that poor and non-poor pupils essentially go separate ways on leaving their PS. The index depends mechanically on both $p$ and $S$, and we control for this below.

The results are tabulated in Table 8 for all PSs with both poor and non-poor pupils, but not controlling for $p$ and $S$. The mean value for London shows that a third of PSs there send pupils on to SSs in a bifurcated manner. The fact that there are hardly any PSs in London (1 percent) which send all their pupils on in mixed ways (having a bifurcation score of 0) is also indicative of a low degree of commonality in the flows. The degree of bifurcation seems to correlate with the degree of urban-ness: the median value is highest in London, lowest for rural PSs; the number of zero values is lowest in London and highest in rural areas.

As both the size and poverty of PSs is correlated with the degree of urban-ness, we deal with this by controlling for them in a regression. The results are in Table 9. The first column does not include controls for LEAs, the second does. As expected, quadratics in both $p$ and $S$ matter and pick up the mechanical dependence of the index on these. Conditional on those, we see that higher-scoring PSs tend to have more bifurcated flows, as do those with more FSM children. We also see that flows are indeed more bifurcated in urban LEAs. One reason for this is that in urban areas there are more feasible destination schools, so in this dimension there is more school choice. This allows the greater poverty bifurcation that we see in the data to occur. In rural areas, with a more limited set of SSs to choose from, to a degree much of the PS cohort moves together and there is therefore less bifurcation.

**4. Conclusions**

In this paper we have documented the flows of pupils from primary schools to secondary schools in England's state education system. The way in which pupils are (re)allocated across schools at the age of 11 determines the extent to which pupils are sorted, and thus has an impact on the make-up of secondary school peer groups. This in turn may potentially impact both on pupils' educational experience and their attainment.

We consider these primary to secondary school transitions at both school and pupil level. At school level we show that there are systematic differences in the destinations that primary schools send to, according to the type of pupils in these schools. In particular, pupils from poor primary schools are more widely dispersed. We also find that poor primary schools (those with a higher proportion of FSM pupils) send to secondary schools that are both lower performing and also have high proportions of FSM pupils. These two results together suggest that the experiences of FSM pupils at age 11 may be quite different, on average, to their non-FSM peers: FSM pupils' primary peer groups are more fractured at the age of 11, and these pupils tend to find themselves more concentrated within lower performing secondary schools.

Our pupil level analysis confirms the different experiences of poor and non-poor pupils. We define the modal secondary school as the most popular destination that a primary school's pupils transfer to, and investigate how flows to that school depend on whether it is of higher quality than the LEA average. Again, our results for FSM pupils stand out. While high ability pupils are more likely to go to the modal school if it is better than average, the reverse is true for FSM pupils. Poor pupils are less likely to go to the modal school when it is better than average; more likely to go when it is worse. Finally, we find that high scoring primary schools have more bifurcated flows: poor and non-poor pupils are dispersed across different secondary schools, with the former more likely to attend a low performing secondary school. This pattern of bifurcation is more pronounced in urban areas where the number of feasible destination schools – one measure of school choice – is greater.

Our results suggest that there are systematic differences in the flows of poor and non-poor pupils between primary and secondary schools, and flows are such that poor students appear to be (further) disadvantaged. Their primary school peer groups are more dispersed at age 11, they are more likely to end up in lower performing secondary schools than their non-poor peers and they are less likely to benefit in their transition from having been at a high performing primary school.

It is likely that many different processes are contributing to the transition patterns we observe, and that the worse outcomes we see for poorer children are a combination of choice and constraint on both the demand and the supply sides of the education quasi-market. While we cannot attribute the observed patterns to any one of these processes (or combinations thereof), they are the result of the system of school choice as it currently operates in England. The outcomes we have documented in this paper, therefore, provide a benchmark to judge the extent to which the reform package in the recent Education Act influences inequities in the sorting of pupils across England's schools.

## References


Allen, R. and Vignoles, A. (2007) What should an index of school segregation measure? *Oxford Review of Education*

Bagley, C. 1996: Black and white unite or flight? The racialised dimension of schooling and parental choice. *British Educational Research Journal* 22: 569-580.

Ball, S. J. and Vincent, C. 1998: 'I heard it on the grapevine': 'hot' knowledge and school choice. *British Journal of Sociology of Education* 19: 377-400.

Burgess, S. and Briggs, A. (2006) School Assignment, School Choice and Social Mobility, DP 06/157. CMPO, Bristol.

Burgess, S., Briggs, A., McConnell, B. and Slater, H. (2006) School Choice in England: Background Facts. DP 06/159. CMPO, Bristol

Burgess, S., McConnell, B., Propper, C. and Wilson, D. (2007) The Impact of School Choice on Sorting by Ability and Socio-economic Factors in English Secondary Education. In L. Woessmann and P. Peterson (eds) *Schools and the Equal Opportunity Problem.* MIT Press, Cambridge.

Burgess, S. and Slater, H. (2006) Using Boundary Changes to Estimate the Impact of School Competition on Test Scores. DP 06/158. CMPO, Bristol.

Burgess, S, Wilson, D and Propper, C (forthcoming) The impact of school choice in England: implications from the economic evidence, forthcoming *Policy Studies.*

Butler, T., Hamnett, C., Ramsden, M. and Webber, R. 2007: The best, the worst and the average: secondary school choice and education performance in East London. *Journal of Education Policy*, 22, 7-29.

Clark, D. (2004) Politics, markets and schools: quasi-experimental evidence on the impact of autonomy and competition from a truly revolutionary UK reform. *mimeo*, University of California, Berkeley

Gibbons, S., Machin, S., and Silva, O. (2006) Competition, Choice and Pupil Achievement. CEE DP 56 London: London School of Economics, Centre for the Economics of Education, Paper

Gibbons, S. and Telhaj, S. 2006: *Are schools drifting apart? Intake stratification in English secondary schools*. London: London School of Economics, Centre for the Economics of Education, Paper CEEDP0064.

Gorard, S. and Fitz, J. 2006: What counts as evidence in the school choice debate? *British Educational Research Journal*, 32, 797-816.

Gorard, S., Taylor, C. and Fitz, J. 2001: Social exclusion and public policy: the relationship between local school admission arrangements and segregation by poverty. *International Journal of Sociology and Social Policy*, 21, 10-36.

Gorard, S., Taylor, C. and Fitz, J. (2003) Schools, Markets and Choice Policies. London: RoutledgeFalmer

Johnston, R. J., Burgess, S., Wilson, D. and Harris, R. 2006: School and residential segregation: an analysis of variations across England's Local Education Authorities. *Regional Studies*, 40, 973-990.

Lucey, H. and Reay, D.2002: A market in waste: psychic and structural dimensions of school-choice policy in the UK and children's narratives on 'demonized' schools. Discourse: *Studies in the Cultural Politics of Education* 23: 253-266.

Parsons, E., Chalkley, B. and Jones, A. 2000: School catchments and pupil movements: a case study in parental choice. *Educational Studies,* 26: 33-48.

Pattie, C. J. 1986: Positive discrimination in the provision of primary education in Sheffield. *Environment and Planning A*, 18, 1249-1257.

Reay, D. and Ball, S. J. 1997: 'Spoilt for choice': the working classes and educational markets. *Oxford Review of Education* 23: 89-101.

Reay, D. and Ball, S. J. 1998: 'Making their minds up': family dynamics of school choice. *British Educational Research Journal* 24: 431-448.

Reay, D. and Lucey, H. 2000a: 'I don't really like it here but I don't want to be anywhere else': children and inner city council estates. *Antipode* 32: 410-428.

Reay, D. and Lucey, H. 2000b: Children, school choice and social differences. *Educational Studies* 26: 83-100.

Reay, D. and Lucey, H. 2003: The limits of 'choice': children and inner city schooling. *Sociology* 37: 121-142.

West, A., Pennell, H. and Noden, P. 1998: School admissions: increasing equity, accountability and transparency. *British Journal of Educational Studies* 46: 188-200.

White, P., Gorard, S., Fitz, J. and Taylor, C. 2001: Regional and local differences in admission arrangements for schools. *Oxford Review of Education*, 27, 317-337.

**Table 1: Summary statistics for primary school level dependent variables (n=12367)**

| | | Mean of Destination Count | Mean Sum of Squares |
|---|---|---|---|
| Full sample | | 4.793 | 5954.141 |
| | | (3.277) | (2660.194) |
| Split by PS location | London | 9.657 | 3000.096 |
| | | (3.910) | (1790.160) |
| | Non-London urban | 4.944 | 5865.276 |
| | | (2.666) | (2418.605) |
| | Rural | 2.707 | 7216.372 |
| | | (1.684) | (2453.333) |
| Split by PS KS2 performance | Top 1/3 | 4.131 | 6234.617 |
| | | (2.980) | (2750.605) |
| | Middle 1/3 | 4.592 | 6152.569 |
| | | (3.171) | (2630.579) |
| | Bottom 1/3 | 5.350 | 5592.034 |
| | | (3.444) | (2606.034) |
| Split by PS % FSM | Top 1/3 (most FSM pupils) | 6.284 | 4942.382 |
| | | (3.703) | (2522.353) |
| | Middle 1/3 | 4.396 | 6376.046 |
| | | (2.966) | (2555.006) |
| | Bottom 1/3 | 3.585 | 6620.531 |
| | | (2.344) | (2585.197) |

*Notes:*

1. Standard deviations in parentheses.
2. Destination Count is the number of different secondary schools that each primary school's pupils move to.
3. Sum of Squares is the squared percentage of the primary school cohort that attends each distinct secondary school, summed by primary school. It has a maximum value of 10,000, which would be realised if all pupils moved to the same secondary school.

**Table 2: Regression of two measures of cohort dispersion at primary school (PS) level on primary school characteristics**

| | (i) | (ii) |
|---|---|---|
| | Destinations Count | Sum of squares |
| PS average KS2 score | -0.013 | 0.021 |
| | (0.012) | (13.235) |
| PS % FSM | 1.017 | -1,295.021 |
| | (0.168)** | (172.150)** |
| Urban PS dummy | 0.333 | -724.304 |
| | (0.052)** | (61.997)** |
| PS size (cohort) | 0.043 | 6.800 |
| | (0.001)** | (1.046)** |
| Constant | 2.039 | 6,584.145 |
| | (0.371)** | (432.980)** |
| R-squared | 0.62 | 0.39 |
| N | 12367 | 12367 |

*Notes:*

1. Robust standard errors in parentheses. *Significant at 5%. **Significant at 1%.
2. Destination Count is the number of different secondary schools that each primary school's pupils move to.
3. Sum of Squares is the squared percentage of the primary school cohort that attends each distinct secondary school, summed by primary school. It has a maximum value of 10,000, which would be realised if all pupils moved to the same secondary school.
4. Also included in the regression but not reported are dummies for the denomination of the primary school, for funding type and LEA dummies.

**Table 3: Summary statistics for secondary school level dependent variables (n=2517)**

| | | Mean of Intake Count | Mean of Sum of Squares |
|---|---|---|---|
| Full sample | | 23.978 | 1536.020 |
| | | (11.756) | (895.467) |
| Split by SS location | London | 36.940 | 915.994 |
| | | (13.768) | (567.234) |
| | Non-London urban | 22.548 | 1575.952 |
| | | (10.574) | (863.830) |
| | Rural | 20.387 | 1769.768 |
| | | (8.006) | (944.207) |
| Split by SS KS3 performance | Top 1/3 | 27.225 | 1362.664 |
| | | (12.866) | (826.560) |
| | Middle 1/3 | 22.612 | 1619.786 |
| | | (9.818) | (850.121) |
| | Bottom 1/3 | 22.099 | 1625.503 |
| | | (11.707) | (977.887) |
| Split by SS % FSM | Top 1/3 (most FSM pupils) | 24.817 | 1470.890 |
| | | (13.324) | (965.125) |
| | Middle 1/3 | 22.035 | 1645.639 |
| | | (9.546) | (866.524) |
| | Bottom 1/3 | 25.076 | 1492.948 |
| | | (11.863) | (840.412) |

*Notes:*

1. Standard deviations in parentheses.
2. Intake Count is the number of different primary schools that each secondary school's pupils come from.
3. Sum of Squares is the squared percentage of the secondary school cohort that comes from each distinct primary school, summed by secondary school. It has a maximum value of 10,000, which would be realised if all pupils came from the same primary school.

**Table 4: Regression of two measures of intake fragmentation at secondary school (SS) level on secondary school characteristics**

| | (i) | (ii) |
|---|---|---|
| | Intake Count | Sum of Squares |
| SS average KS3 score | 0.703 | -40.737 |
| | (0.129)** | (10.626)** |
| SS % FSM | 5.164 | -413.679 |
| | (2.597)* | (300.850) |
| Urban SS dummy | -0.352 | 74.509 |
| | (0.425) | (48.300) |
| SS size (cohort) | 0.055 | -4.223 |
| | (0.003)** | (0.326)** |
| Constant | -16.520 | 4,013.246 |
| | (4.952)** | (411.603)** |
| R-squared | 0.61 | 0.45 |
| N | 2517 | 2517 |

*Notes:*

1. Robust standard errors in parentheses. *Significant at 5%. **Significant at 1%.
2. Intake Count is the number of different primary schools that each secondary school's pupils come from.
3. Sum of Squares is the squared percentage of the secondary school cohort that comes from each distinct primary school, summed by secondary school. It has a maximum value of 10,000, which would be realised if all pupils came from the same primary school.
4. Also included in the regression but not reported are dummies for the denomination of the secondary school, for funding type, for selection policy, for single-sex schools, and LEA dummies.

**Table 5: Probit linking primary school and modal secondary school performance.**

| | Modal KS3 Vs. LEA average |
|---|---|
| PS average KS2 score | 0.053 |
| | (18.55)** |
| PS % FSM | -0.980 |
| | (23.97)** |
| Urban PS dummy | -0.115 |
| | (9.60)** |
| PS size (cohort) | -0.002 |
| | (7.30)** |
| Pseudo $R^2$ | 0.179 |
| N | 12350 |

*Notes:*

1. Coefficients reported are sample average marginal effects. Robust *z* statistics in parentheses. *Significant at 5%. **Significant at 1%.
2. Dependent variable equals 1 if the mean KS3 score of the modal secondary school is greater than, or equal to, the LEA KS3 mean.
3. Also included in the regression but not reported are dummies for the LEA of the primary school.

**Table 6: Probit of whether a pupil follows the modal path or not, defining the modal school as the most popular school**

| | (i) | (ii) | (iii) |
|---|---|---|---|
| **Pupil's:** | | | |
| FSM | -0.005 | -0.011 | -0.004 |
| | (2.23)* | (3.21)** | (1.34) |
| KS2 Score | -0.002 | -0.002 | -0.003 |
| | (10.04)** | (7.20)** | (7.77)** |
| **PS's:** | | | |
| KS2 average in top quartile of LEA (0 1) | 0.003 | 0.070 | 0.070 |
| | (0.63) | (3.35)** | (3.41)** |
| % FSM in top quartile of LEA (0 1) | -0.019 | -0.044 | -0.050 |
| | (4.47)** | (2.62)** | (3.08)** |
| Number of destination SS | -0.039 | -0.039 | -0.036 |
| | (58.12)** | (58.08)** | (45.59)** |
| **Interactions:** | | | |
| Pupil FSM with PS KS2 | | 0.005 | 0.005 |
| | | (0.76) | (0.76) |
| Pupil FSM with PS % FSM | | 0.013 | 0.012 |
| | | (2.59)** | (2.46)* |
| Pupil KS2 with PS KS2 | | -0.002 | -0.002 |
| | | (3.48)** | (3.45)** |
| Pupil KS2 with PS % FSM | | 0.001 | 0.001 |
| | | (1.80) | (2.01)* |
| LEA dummies? | N | N | Y |
| Age interacted with PS variables? | N | Y | Y |
| Ethnicity interacted with PS variables? | N | Y | Y |
| N | 412793 | 412793 | 412793 |
| Pseudo $R^2$ | 0.097 | 0.097 | 0.109 |

*Notes:*

1. Coefficients reported are sample average marginal effects. Robust *z* statistics, clustered on PS, in parentheses. *Significant at 5%. **Significant at 1%.
2. Dependent variable equals 1 if pupil follows the modal path, 0 otherwise.
3. Age-within-year dummies, ethnicity dummies and primary school funding type dummies included in all regressions

**Table 7: Probit of whether a pupil follows the modal path or not split into low and high performing KS3 modal SS**

| | Low | | High | |
|---|---|---|---|---|
| | (i) | (ii) | (iii) | (iv) |
| **Pupil's:** | | | | |
| FSM | 0.022 | 0.019 | -0.032 | -0.031 |
| | (7.76)** | (4.21)** | (9.27)** | (6.66)** |
| KS2 Score | -0.006 | -0.008 | 0.001 | 0.002 |
| | (18.75)** | (16.21)** | (4.27)** | (5.14)** |
| **PS's:** | | | | |
| KS2 average in top quartile of LEA (0 1) | -0.003 | 0.130 | -0.008 | 0.111 |
| | (0.039) | (3.65)** | (1.56) | (4.79)** |
| % FSM in top quartile of LEA (0 1) | -0.011 | -0.120 | -0.023 | -0.108 |
| | (2.26)* | (5.84)** | (3.24)** | (3.56)** |
| Number of destination SS | -0.029 | -0.029 | -0.039 | -0.039 |
| | (28.88)** | (28.94)** | (32.02)** | (32.14)** |
| **Interactions:** | | | | |
| Pupil FSM with PS KS2 | | 0.038 | | 0.009 |
| | | (3.56)** | | (1.04) |
| Pupil FSM with PS % FSM | | 0.002 | | -0.008 |
| | | (0.36) | | (1.04) |
| Pupil KS2 with PS KS2 | | -0.005 | | -0.004 |
| | | (3.99)** | | (5.58)** |
| Pupil KS2 with PS % FSM | | 0.004 | | 0.003 |
| | | (6.08)** | | (3.29)** |
| Age interacted with PS variables? | N | Y | N | Y |
| Ethnicity interacted with PS variables? | N | Y | N | Y |
| Constant | | | | |
| N | 209444 | 209444 | 203341 | 203341 |
| Pseudo $R^2$ | 0.090 | 0.091 | 0.138 | 0.139 |

*Notes:*

1. Coefficients reported are sample average marginal effects. Robust *z* statistics, clustered on PS, in parentheses. *Significant at 5%. **Significant at 1%.
2. Dependent variable equals 1 if pupil follows the modal path, 0 otherwise.
3. Age-within-year dummies, ethnicity dummies, PS funding type dummies and dummies for the LEA of the PS included in all regressions

**Table 8: Summary statistics for measure of the prevalence of bifurcated flows from PS to SS, for those PS that have both FSM and non-FSM claiming pupils.**

| | Mean | 25th %ile | 50th %ile | 75th %ile | Number of 0's (%) | Number of obs. |
|---|---|---|---|---|---|---|
| London | 0.333 | 0.164 | 0.270 | 0.447 | 9 (0.01) | 1327 |
| Non-London urban | 0.182 | 0.050 | 0.111 | 0.237 | 504 (0.08) | 6572 |
| Rural | 0.218 | 0.018 | 0.100 | 0.310 | 514 (0.24) | 2163 |
| Full Sample | 0.210 | 0.051 | 0.127 | 0.282 | 1027 (0.10) | 10062 |

*Notes:*

1. Bifurcation variable measures the proportion of a primary school's cohort who transfer to secondary school only with peers of the same FSM status as them. So, for example, if a primary school's pupils transfer to 2 secondary schools, and all the non-FSM pupils go to the first and all the FSM pupils to the second, this school would have a measure of bifurcation equal to 1.

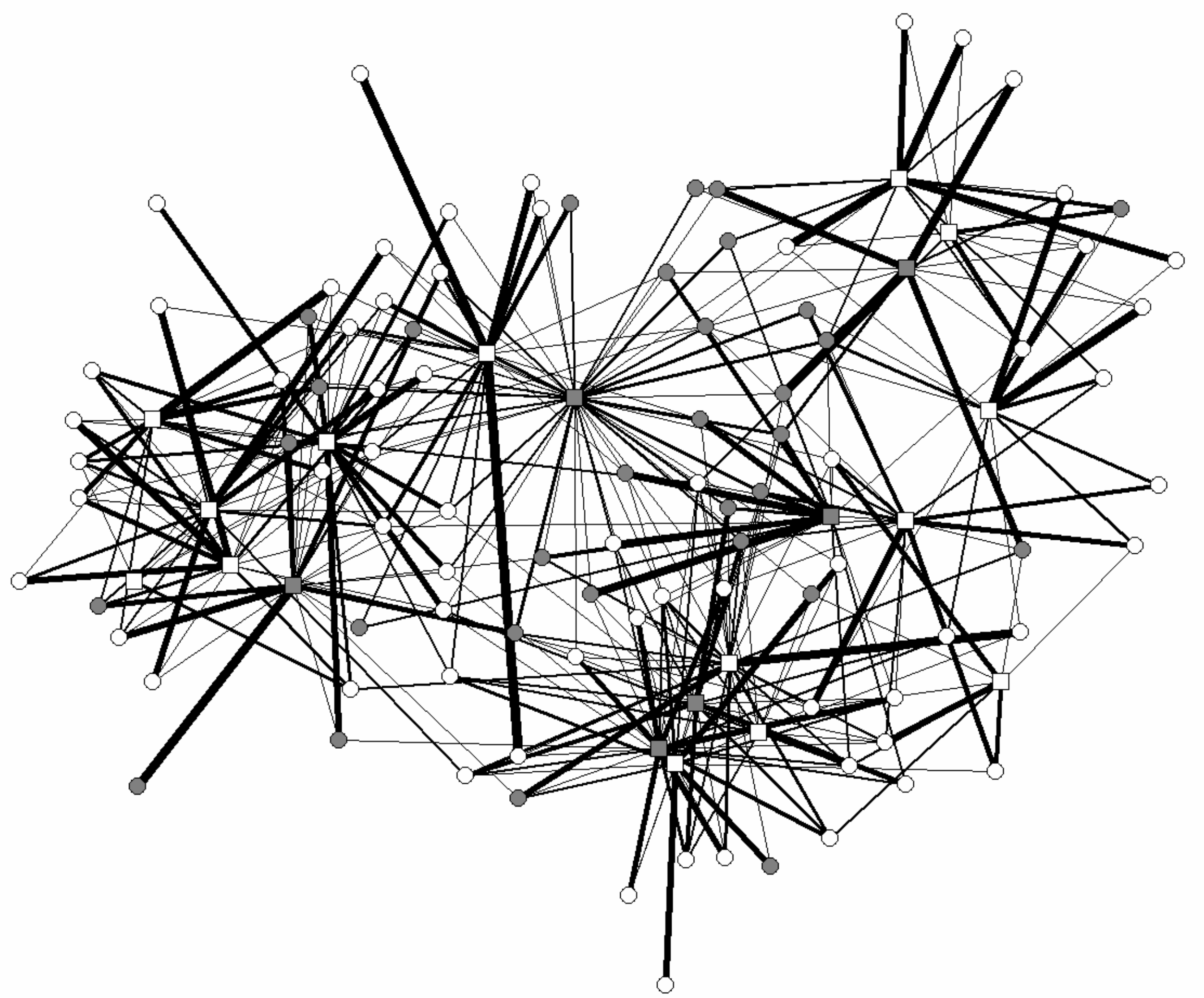
**Table 9: Regressions of bifurcated transfer measure on PS variables.**

| | (i) | (ii) |
|---|---|---|
| PS average KS2 score | 0.009 | 0.003 |
| | (0.002)** | (0.001)* |
| PS % FSM | -1.011 | -1.213 |
| | (0.048)** | (0.051)** |
| PS % FSM - squared | 1.327 | 1.408 |
| | (0.070)** | (0.075)** |
| Urban dummy | 0.094 | 0.030 |
| | (0.007)** | (0.007)** |
| PS cohort size | -0.007 | -0.007 |
| | (0.000)** | (0.000)** |
| PS cohort size - squared, | 0.004 | 0.004 |
| divided by 100 | (0.000)** | (0.000)** |
| LEA dummies? | N | Y |
| Constant | 0.198 | 0.472 |
| | (0.045)** | (0.052)** |
| R-squared | 0.14 | 0.28 |
| N | 10061 | 10061 |

*Notes:*

1. Robust standard errors in parentheses. *Significant at 5%. **Significant at 1%.
2. Bifurcation variable measures the proportion of a primary school's cohort who transfer to secondary school only with peers of the same FSM status as them. See note above for example.

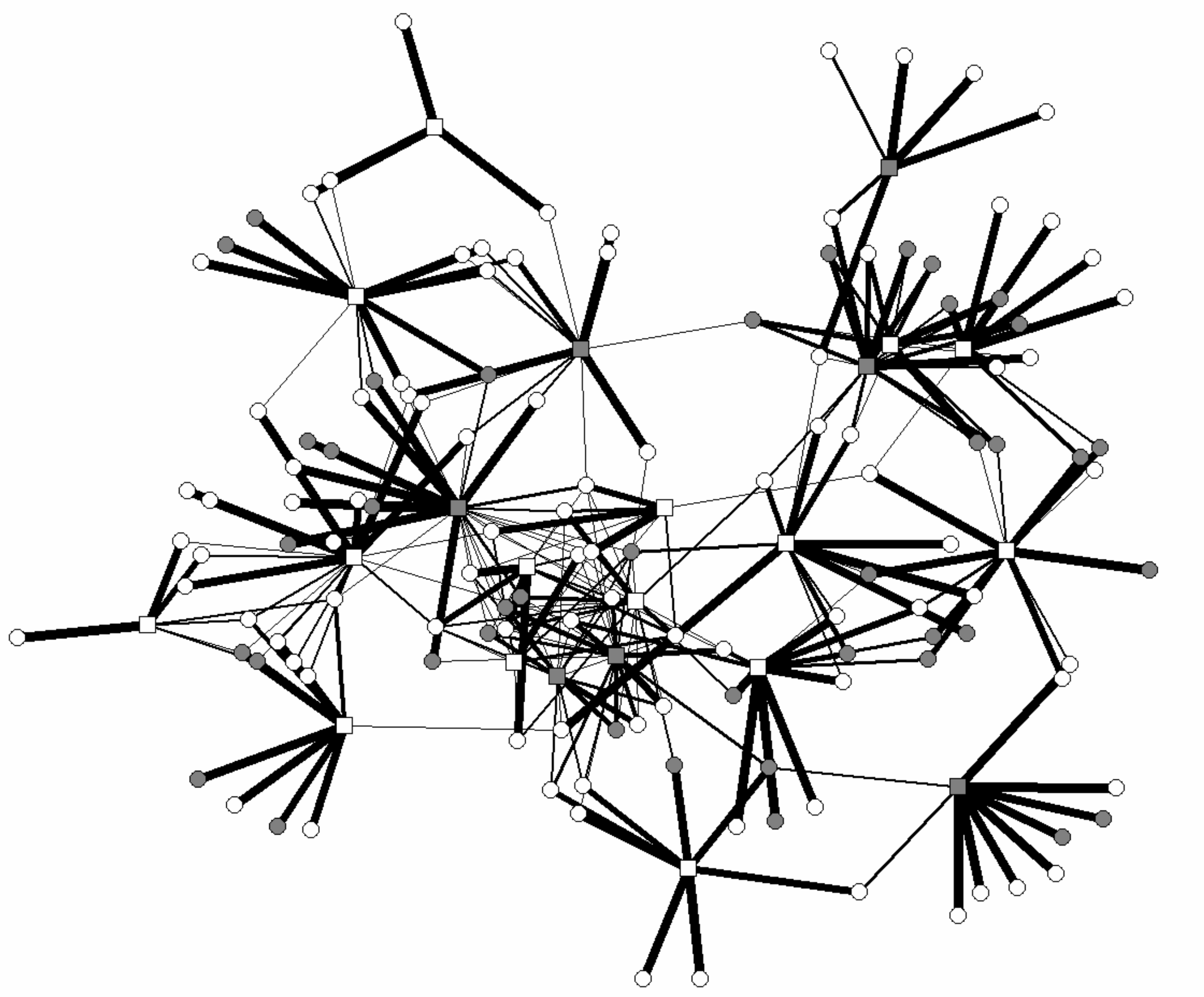
**Figure 1: Primary to secondary flows for an urban LEA**



*Notes:*

1. The thickness of the lines linking primary and secondary schools is proportional to the number of flows between them.
2. Circles are primary schools, squares are secondary schools.
3. Grey schools are those in the top third of the KS2 distribution (primary schools) and KS3 distribution (secondary schools).

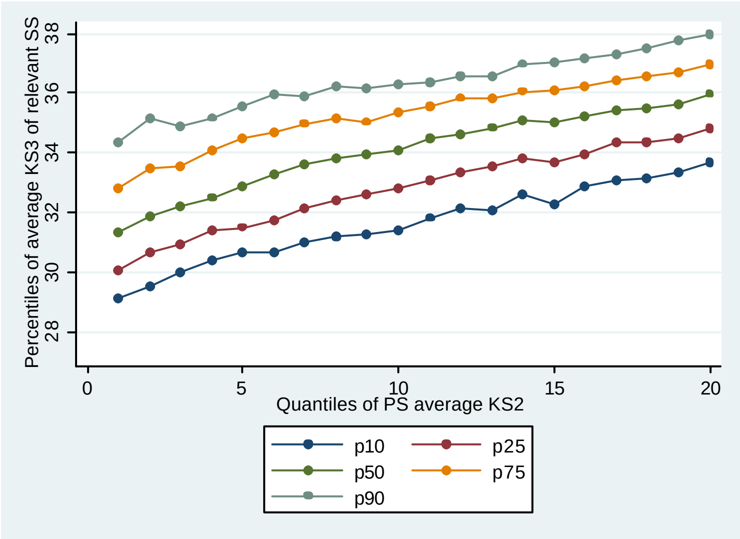
## Figure 2: Primary to secondary flows for a rural LEA



*Notes:*

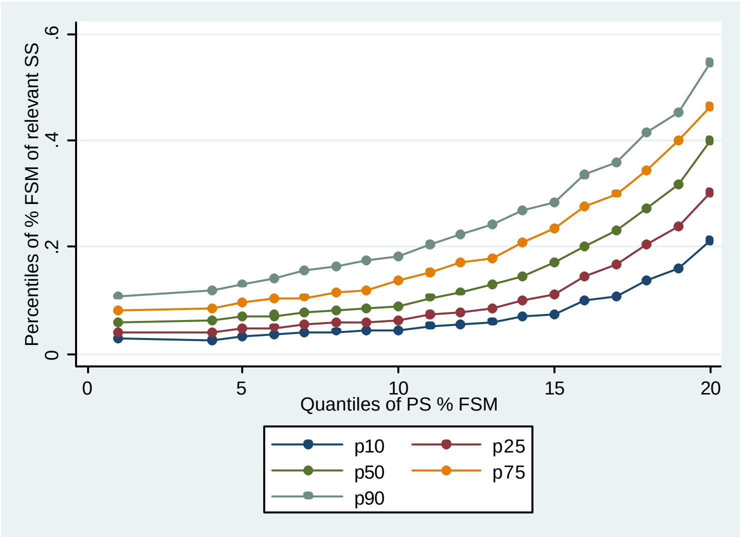
1. The thickness of the lines linking primary and secondary schools is proportional to the number of flows between them.
2. Circles are primary schools, squares are secondary schools.
3. Grey schools are those in the top third of the KS2 distribution (primary schools) and KS3 distribution (secondary schools).

**Figure 3: KS2 Performance of primary schools and KS3 performance of secondary schools**



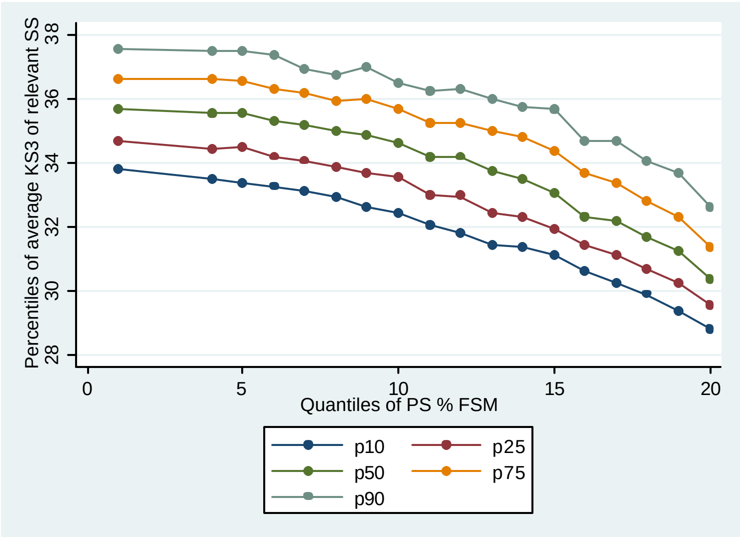

*Note:* p10, p25, p50, p75 and p90 are the 10th, 25th, 50th, 75th and 90th percentiles respectively.

**Figure 4: Percentage FSM children in primary school and in secondary school**



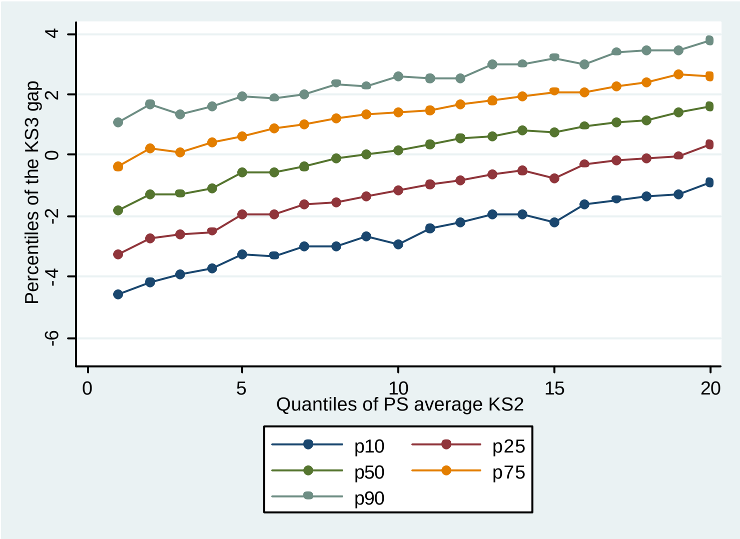

*Note:* p10, p25, p50, p75 and p90 are the 10th, 25th, 50th, 75th and 90th percentiles respectively.

**Figure 5: Percentage FSM children in primary school and KS3 score of secondary school**



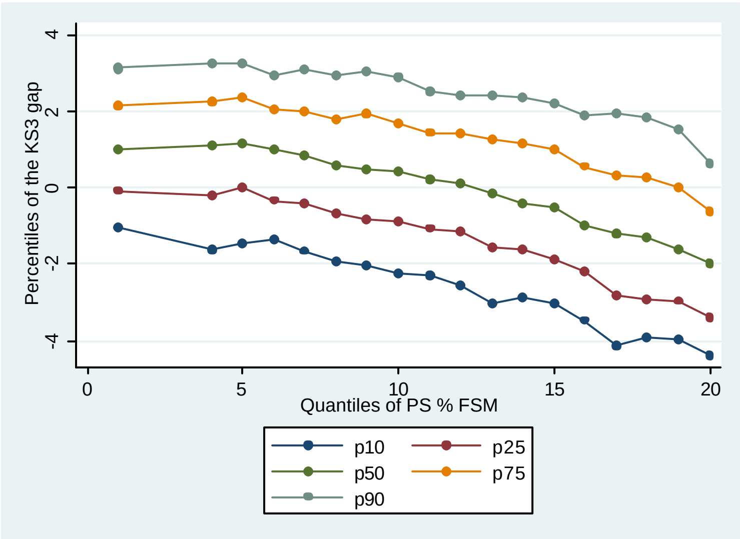

*Note:* p10, p25, p50, p75 and p90 are the 10th, 25th, 50th, 75th and 90th percentiles respectively.

**Figure 6: Modal secondary schools by primary school KS2**



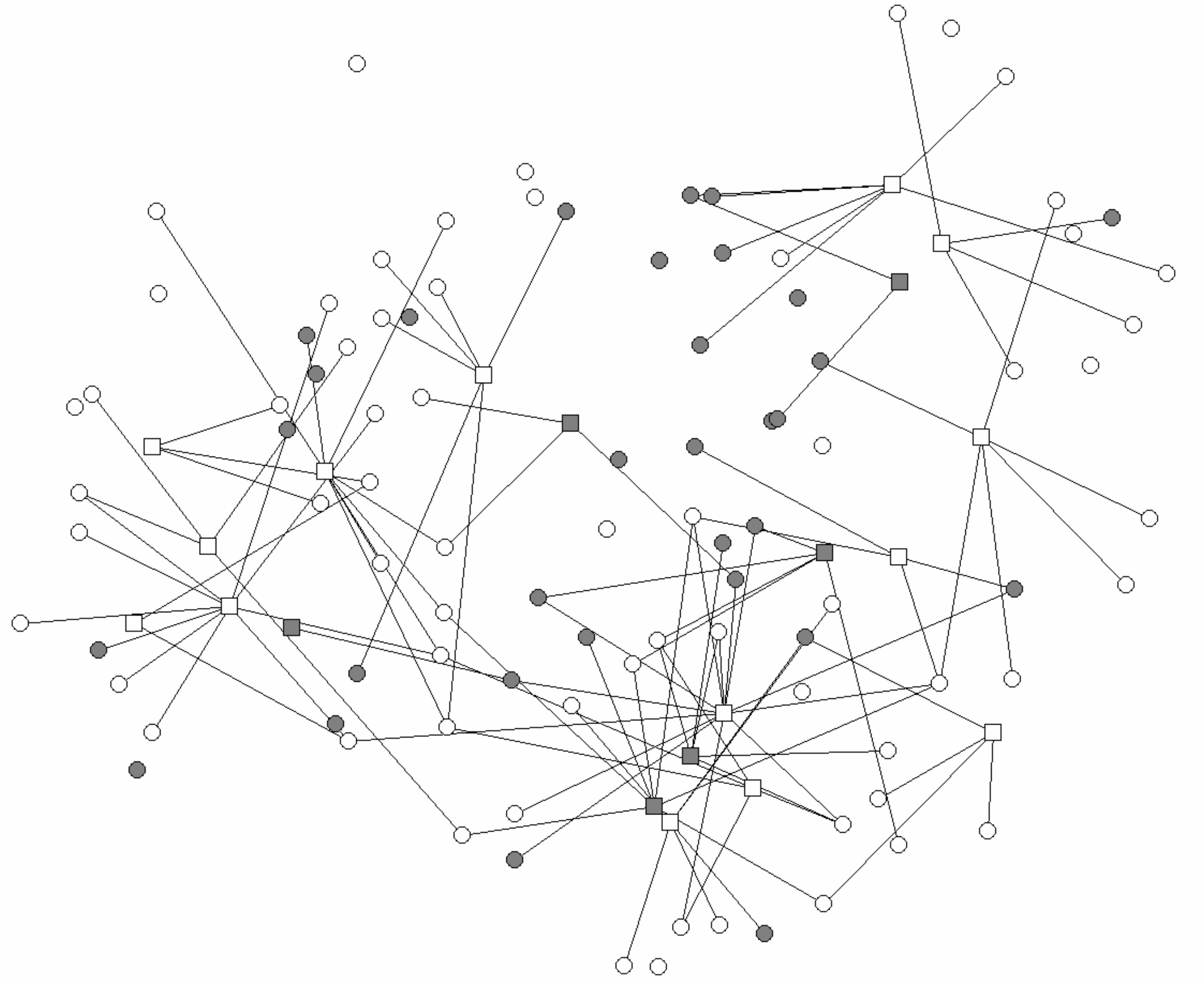

*Note:* p10, p25, p50, p75 and p90 are the 10th, 25th, 50th, 75th and 90th percentiles respectively of the gap between the mean KS3 score of the modal secondary school and the LEA KS3 average.

**Figure 7: Modal secondary schools by primary school FSM**




*Note:* p10, p25, p50, p75 and p90 are the 10th, 25th, 50th, 75th and 90th percentiles respectively of the gap between the mean KS3 score of the modal secondary school and the LEA KS3 average.

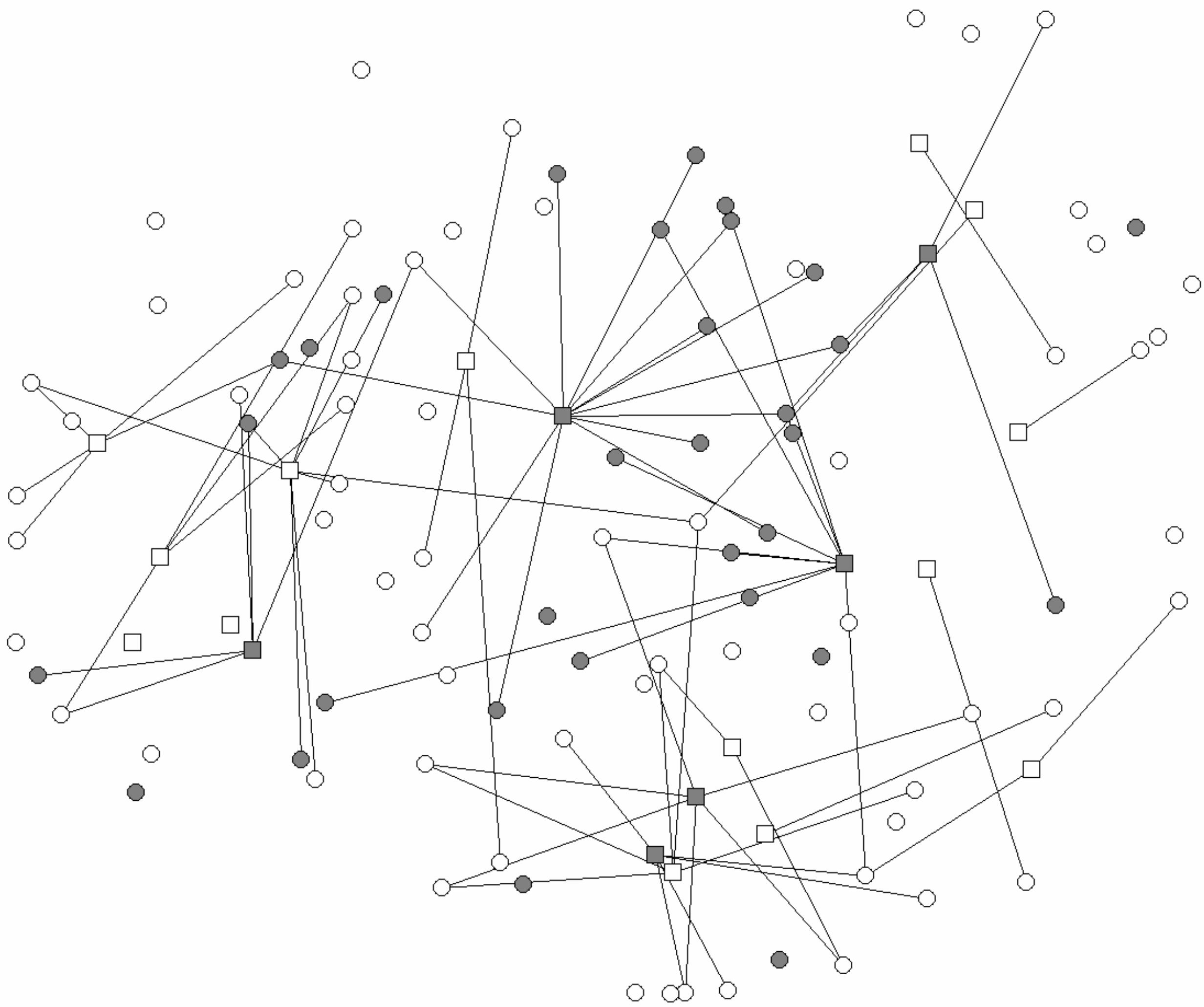
**Figure 8: Flows disproportionately made by FSM children, urban LEA**



*Notes:*

1. Only flows made disproportionately by FSM pupils are marked.
2. Circles are primary schools, squares are secondary schools.
3. Grey schools are those in the top third of the KS2 distribution (primary schools) and KS3 distribution (secondary schools).

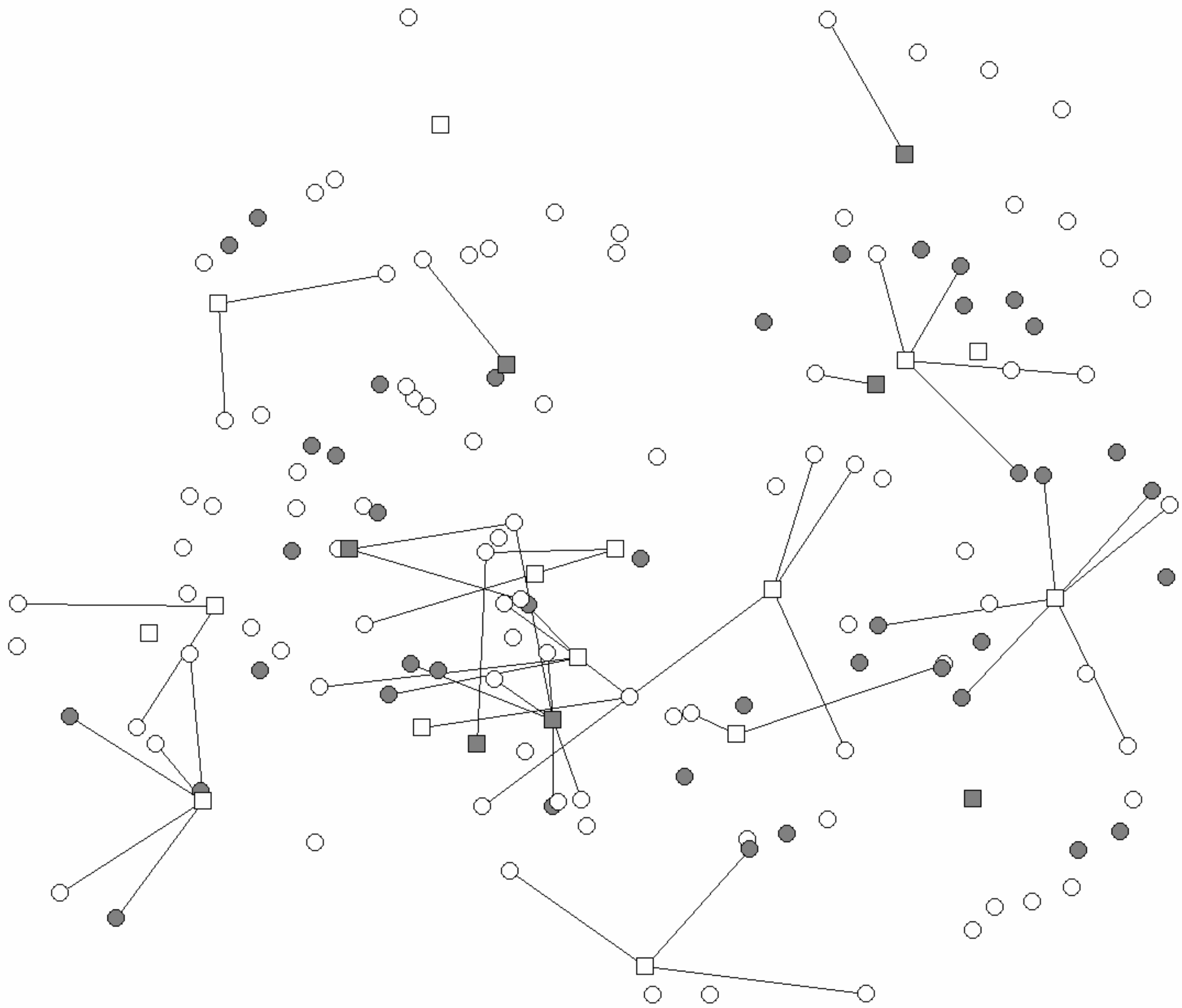
**Figure 9: Flows disproportionately made by non-FSM children, urban LEA**



*Notes:*

1. Only flows made disproportionately by non-FSM pupils are marked.
2. Circles are primary schools, squares are secondary schools.
3. Grey schools are those in the top third of the KS2 distribution (primary schools) and KS3 distribution (secondary schools).

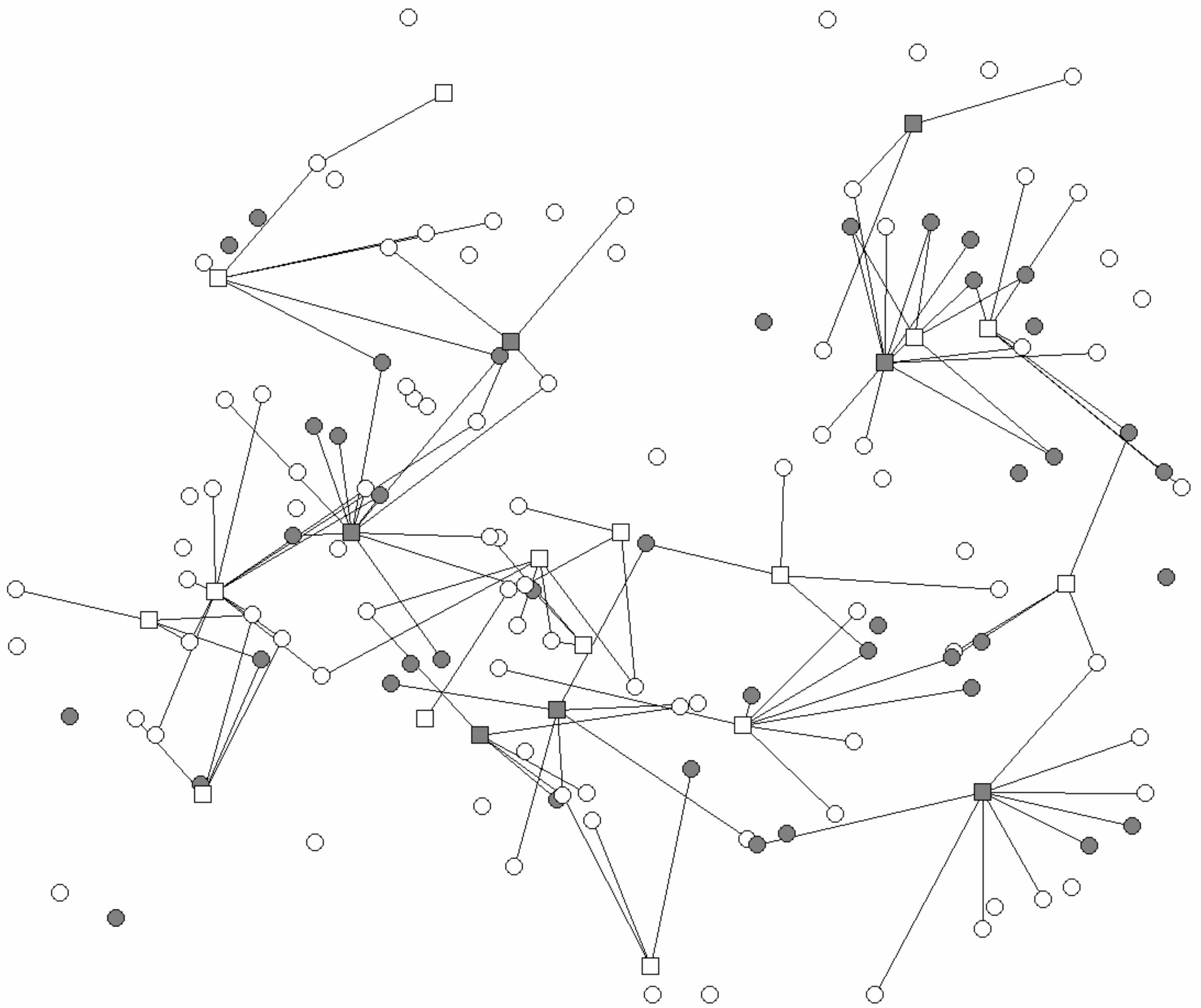
**Figure 10: Flows disproportionately made by FSM children, rural LEA**



*Notes:*

1. Only flows made disproportionately by FSM pupils are marked.
2. Circles are primary schools, squares are secondary schools.
3. Grey schools are those in the top third of the KS2 distribution (primary schools) and KS3 distribution (secondary schools).

**Figure 11: Flows disproportionately made by non-FSM children, rural LEA**



*Notes:*

4. Only flows made disproportionately by non-FSM pupils are marked.
5. Circles are primary schools, squares are secondary schools.
6. Grey schools are those in the top third of the KS2 distribution (primary schools) and KS3 distribution (secondary school).