The distributional impact of increased school resources:
the Specialist Schools Initiative and the Excellence in Cities Programme[1]

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This paper estimates the impact of two flagship education policies, the Specialist Schools initiative and the Excellence in Cities programme, on the attainment of secondary school pupils in England. The focus is on their relative impact across gender, ethnic and socio-economic groups. The three main findings are, first, that the EiC Programme has been substantially more effective than the specialist schools initiative in raising the attainment of ethnic minority pupils, particularly Asians. Second, specialist schools have favoured pupils from economically advantaged families whereas the EiC programme has been more effective in raising the attainment of pupils from poor families. Third, both policies are estimated to have been more effective for girls than for boys, thereby contributing to the educational gender gap.

Key words: Ethnicity, Gender, Test scores, Excellence in Cities, Specialist schools.

JEL classifications: I20, I21, I28

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1. Introduction

Governments across the world recognise that educational attainment is a critical factor in economic and social advancement. Evidence of the belief in the power of education to bring economic improvements is clearly indicated by global trends in educational expenditure over recent decades. Both total educational expenditure and expenditure per pupil have been on an upward trend in OECD countries in recent decades (OECD 2008).[2] It is also widely recognised that education is the key to breaking down barriers to intergenerational mobility so that pupils from economically deprived families can escape from poverty through greater educational achievement, and hence greater success in the labour market than attained by their parents.

The question facing policymakers is how educational outcomes can be improved, especially for the economically underprivileged since it is primarily this group that suffers from poor educational attainment and consequently low skill levels. There has been intense debate amongst economists about how public education should be delivered and the extent to which extra resources will lead to improvements in educational outcomes. At one end of the spectrum are those who argue that the provision of education should be controlled by central government on the grounds that a decentralised approach will lead to socio-economic segregation and ultimately to the reinforcement of income inequalities (Levin 1991a, 1991b). At the other extreme are those who have challenged the traditional model of centralised provision (following Friedman 1962). They argue for a decentralised approach on the grounds that this is likely to increase both allocative and productive efficiency (Hoxby 1996).

In recent years, several countries including the UK have moved towards a more decentralised system characterised, for example, by greater parental choice, delegation of expenditure decisions to schools, competition for pupils between schools, permitting school enrolment to respond to demand for places, and contracting educational services out to private suppliers. In other words, there has been a deliberate shift towards the creation of a quasi-market in educational provision. These and other policies have been the hallmark of several radical changes to education policy in England since the early 1990s following the Education Reform Act of 1988. The reforms of the early 1990s received a major boost after Labour came to power in 1997. Expenditure per pupil increased by around 50% in real terms during 1997-2007 and many new policy initiatives have been introduced in an attempt to improve the educational outcomes of primary and secondary school pupils.[3]

Two flagship policies directed specifically at secondary school pupils are the focus of the present paper. The Specialist Schools initiative and the Excellence in Cities (EiC) programme have provided extra resources to schools in the form of capital grants and increased recurrent spending. The

[2] For the OECD as a whole, expenditure on education as a proportion of the public budget increased from 11.9% to 13.2% between 1995 and 2005; while the index of (real) expenditure per student increased from 89 to 119 in primary, secondary and other non-tertiary education. See *Education at a Glance 2008: OECD Indicators*. The website is http://fiordiliji.sourceoecd.org/pdf/factbook2008/302008011e-09-02-03.pdf

[3] Total real expenditure on secondary schools increased by 60% from £9.9b in 1997/98 to £15.8b in 2006/7, and real expenditure per FTE pupil increased by over 50%, from £3206 in 1997/98 to £4836 in 2006/07 (at 2005/6 prices). See DCSF, *Annual Report 2007*, p102 and *Annual Report 2008*, p.150, annex N.

Specialist Schools initiative, which began in 1994, sought to raise attainment by inducing all qualifying secondary schools to specialise in subjects in which they have a comparative advantage, thereby increasing diversity and providing parents with greater school choice. The EiC programme took a more targeted approach to raising attainment by deliberately focusing resources, from its inception in 1999, on schools in deprived inner city areas with low levels of attainment and a high proportion of pupils from poor families.

Since these two flagship policies have differed fundamentally in their approach to improving educational attainment, it is important for policy makers to know which approach has been the most effective. Previous attempts to estimate the impact of these two resource-based policies have focused primarily on each policy separately. The Specialist Schools initiative, for example, has been evaluated by Gorard (2002), Jesson and Crossley (2004), Schagen and Goldstein (2002), Noden and Schagen (2006), and Taylor (2007), while the EiC programme has been the focus of papers by Machin, McNally and Meghir (2007) and Kendall *et al*. (2005). Since the two policies ran concurrently from 1999, there is a strong case for investigating their *simultaneous* impact on educational attainment. The only previous paper attempting to estimate the impact of both policies simultaneously uses *school*-level data (Bradley and Taylor 2008). The present paper extends previous work by using *pupil*-level data.

An issue of crucial importance in estimating the impact of resource-based policies concerns their distributional consequences. This issue is particularly important for UK policymakers in view of the wide gender and ethnic disparities in educational outcomes at the end of compulsory education. A critical feature of these gender and ethnic disparities in attainment is the considerable widening that occurs during the final two years of compulsory education. The sharp widening of the gender gap across all ethnic groups is shown Figure 1 (for the 2003 cohort of pupils). Ethnic disparities in attainment are shown separately for boys and girls in Figures 2 and 3. For both boys and girls, Asian pupils improve their position relative to whites during the final two years of compulsory education whilst Black Caribbean pupils fall even further behind.

Although both gender and ethnic differences in attainment have been investigated extensively in previous research, very little progress has yet been made in identifying and quantifying the causes of these disparities (Burgess *et al*. 2004, Wilson, Burgess and Briggs 2005, Andrews *et al*. 2007, Casson and Kingdom 2007, Kingdom and Casson 2007). A primary concern of the present paper is therefore to investigate the distributional impact of the Specialist Schools initiative and the EiC programme on pupil attainment according to their gender, ethnicity and family income, especially since these two policies are likely to have had different effects across the socio-demographic spectrum. The Specialist Schools initiative, for instance, has favoured schools with above average attainment levels, whereas the EiC programme has specifically targeted schools with low attainment

and a high proportion of pupils from poor families.[4] We therefore seek to discover not only the extent to which these two policies have been effective in raising overall test scores but also whether they have been more effective for some socio-demographic groups than for others.

Our main findings are as follows. First, the Specialist Schools programme has been largely ineffective in raising educational attainment, but in so far as the impact has been positive, it has favoured pupils with higher initial levels of attainment (as indicated by test scores at age 11). Second, both policies are estimated to have been more effective for girls than for boys, thereby contributing to the so-called 'educational gender gap'. Third, the EiC programme has been much more effective than the Specialist Schools initiative in helping to raise the educational attainment of ethnic minority pupils, especially Asian girls. Fourth, both policies have notably failed to raise levels of attainment for white boys from disadvantaged backgrounds. Hence, our overall conclusion is that the EiC programme has been far more successful than the Specialist Schools initiative in raising attainment levels during secondary education. The EiC programme has been particularly successful in raising attainment for pupils from ethnic minorities attending schools in economically deprived neighbourhoods.

The remainder of this paper is structured as follows. Section 2 briefly outlines the Specialist Schools initiative and the EiC programme and reviews previous attempts to estimate their impact on educational attainment. Section 3 explains our econometric approach and describes the data and variables used in the statistical analysis, while section 4 discusses the results. Section 5 concludes.

2. Previous studies of the effect of the Specialist Schools Initiative and the EiC Programme on test scores

2.1 Specialist schools

The Specialist Schools Initiative began in 1994 with the designation of technology colleges in selected secondary schools in England. By 2007, over 85% of all secondary schools in England had specialist status in at least one of ten available subject areas.[5] The original aim was that all secondary schools in England would eventually have specialist status (Levavic and Jenkins 2004), the intention being to improve attainment through schools specialising in the subjects in which they have a comparative advantage and through pupil preferences being matched more closely with a school's syllabus.

Schools were incentivised to apply for specialist status by a capital grant from the government of £100,000 together with extra annual funding of £129 per pupil, thereby increasing income by around 5% per annum over a period of at least four years following designation of specialist status.

[4] The percent of pupils eligible for free school meals was 14.7% for specialist schools and 20.7% for non-specialist schools in 2006. For the first phase of the EiC programme in 1999/2000, the corresponding percentages were 35.6% for participants and 14.7% for non-participants.

[5] The specialisms were introduced as follows: languages in 1995; art and sport in 1997; business & enterprise, engineering, maths & computing, and science in 2002; and humanities and music in 2004. From September 2007, a vocational specialism has been added and schools have also been allowed to specialise in more than one subject. In 2006/7, 10% of all maintained secondary schools had two specialisms. See the following web site at the DCSF: http://www.standards.dfes.gov.uk/specialistschools/.

The requirement to obtain matched private sector funding to supplement the initial capital grant resulted in a strong funding bias, especially in the earlier years of the initiative, towards schools with 'good' exam results, as indicated by the proportion of pupils with five or more A* to C grades in the GCSE exams at the end of compulsory education (age 16). This effectively meant that schools with a high proportion of pupils from families on income support have been far less likely to acquire specialist status since private capital endowments have favoured schools with 'good' exam results (Bradley and Taylor, 2008).

There is conflicting evidence on the success of the specialist schools programme. Evidence of a positive effect of specialist schools on exam performance is provided by Gorard (2002), Jesson and Crossley (2004) and OFSTED (2005). These claims have led the Government to argue that the programme has been extremely successful, a view vigorously challenged by the Education and Skills Committee of the House of Commons (House of Commons, 2003, p.4). Furthermore, methodological weaknesses of previous analyses have been identified by Schagen and Goldstein (2002), who are especially critical of the school-level analyses conducted by the Specialist Schools Trust (see also Noden and Schagen, 2006). They argue that multi-level modelling techniques should be used to take into account the multi-level structure of the data. Taylor (2007) argues that all previous research suffers from a fundamental flow: no attempt has been made to investigate whether the switch to specialist status has been associated with a subsequent *change* in a school's performance. When the focus is switched to *changes* in performance over time, rather than simple cross-sectional analyses, Taylor estimates that the Specialist Schools Initiative raised exam results by around 1 percentage point on average, though there is evidence of more substantial impacts for specific areas of specialisation, such as business studies and technology. More recent work, using a panel of secondary schools in England over the period 1992-2006, provides further support that the Specialist Schools Initiative has had only a very modest impact on exam performance (Bradley and Taylor, 2008).

2.2 EiC Partnerships

In contrast to the Specialist Schools Initiative, the *EiC* policy explicitly targets pupils from disadvantaged backgrounds, especially in metropolitan areas. Launched in 1999, the programme included all secondary schools in 25 local education authorities in the major cities of England, and was subsequently extended in 2000 (phase 2) and again in 2001 (phase 3).[6] By 2006, the programme was organised into 57 partnerships, covering approximately one third of all secondary schools. Total funding for the EiC Programme during the period 1999-2006 was approximately £1.7b, with per pupil funding of around £140 per year. Specifically, the EiC Programme had three main elements: first, the establishment of learning mentors, to provide support for pupils with educational or behavioural difficulties; second, learning support units, to provide short-term support for 'difficult-to-teach' pupils; and third, the gifted and talented programme has focused on the most able 5-10% of pupils in these

[6] See 'EiC 1999-2006' on the Standards Site, DCSF (http://www.standards.dcsf.gov.uk/sie/eic/) for more information about the programme.

EiC schools. The aim of the programme has been to improve attainment by raising the motivation and expectations of pupils, improving the quality of teaching and changing the ethos of schools.

There have been relatively few attempts to evaluate the impact of the EiC Programme. In a detailed review, Kendall *et al*. (2005) conclude that the programme created a positive ethos towards learning, resulting in improved pupil motivation, behaviour and attendance. Improvements in test scores, however, were confined to maths at the end of Key Stage 3 and to pupils in the most disadvantaged schools. In further work, Machin, McNally and Meghir (2004, 2007) estimate that the short-run impact of the EiC Programme has been modest, increasing the probability of attaining a grade 5 in maths (on a seven-point scale at age 14) by between 1.9 and 3.4 percentage points. No evidence was found, however, of an impact on the English test score. Two further findings by Machin *et al*. are, first, that the EiC policy has become more effective over time (as phases 1 to 3 have unfolded) and, second, that higher ability pupils benefited from the EiC Programme more than lower ability pupils. Similar results have been obtained by Bradley and Taylor (2008) using a panel of secondary schools in England. They estimate that the EiC Programme has raised the percentage of pupils achieving five or more A* to C grades at age 16 by 3 percentage points; and that the programme's biggest impact was on schools with a high proportion of ethnic minority pupils. As in the Machin *et al.* study, Bradley and Taylor find that the impact of the EiC Programme increased over time.

3. Estimation method and data

3.1 Econometric methodology

Our econometric modelling is based on the education production function (Hanushek, 1979, 1986, 1996; Todd and Wolpin 2003, 2004). We begin with the following general form:

$$Y_{ist} = f(PUP_{is}, FAM_{is}, SCH_{ist(a)}) + \varepsilon_{ist} \quad (1)$$

where Y refers to the test score of pupil i in school s at time t; *PUP* indexes observed pupil characteristics, such as gender and ethnicity; *FAM* refers to family characteristics, such as whether a pupil's parents receive income support; and *SCH* represents a set of school inputs, such as school size and the pupil-teacher ratio. A pupil's educational development is a cumulative process, influenced by the history of family and school inputs as well as unobserved inherited endowments (Todd and Wolpin, 2003). Unfortunately, we do not observe the history of family inputs in our data. The data, however, do contain school inputs measured immediately prior to entry into secondary schooling at age 11.[7] The vector *SCH* therefore includes age-related school inputs, denoted by the subscript *a*. The

[7] These prior school inputs refer to school level inputs at the end of primary schooling which partly determine test score performance at that age. Our preference is to include these school inputs, rather than test score at age 11, since the latter is endogenous.

error term captures the effect of unobserved pupil and school characteristics, as well as measurement error in the test score.

Given our focus on the effects of the two education policy initiatives on educational outcomes, equation 1 can be extended to include policy variables:

$$Y_{ist} = f(PUP_{is}, FAM_{is}, SCH_{ist(a)}, SPEC_{ist}, EiC_{ist}) + \varepsilon_{ist} \quad (2)$$

where *SPEC* refers to whether, and for how long, the school has acquired specialist status whilst the pupil has been at the school. *EiC* has an equivalent definition with respect to *EiC* status. Therefore, for both *SPEC* and *EiC*, we observe not only whether these policies were in operation during a pupil's time at a school, but also how long each policy had been in operation. *SPEC* and *EiC* are censored to correspond to the length of time the pupil has spent at a school in which the policy has been in operation in order to reflect the pupil's exposure to the policy.

The existence of specialist schools adds to the diversity of educational provision in an education district and hence allows pupils to choose schools that better match their preferences and aptitudes. To the extent that this choice improves allocative efficiency, we expect *SPEC* to have a positive effect on educational outcomes. Also, given that specialist schools receive extra funding, which is used to provide a school with extra capital inputs in order to improve attainment across the entire curriculum, it is expected that the longer the pupil has spent in a specialist school the greater should be the effect on the test score.

The extra funding provided under the EiC Programme was targeted at schools with a high proportion of pupils from disadvantaged backgrounds, particularly in metropolitan areas. The aim was to improve the exam performance of 'poor' schools through providing extra resources. We therefore expect the EiC Programme to have a positive effect on the exam performance of pupils, and furthermore, that these effects will be larger the longer a pupil has been at such a school. Since Britain's ethnic minority population tends to be clustered in the poorest metropolitan areas, we expect these pupils to benefit most from the EiC Programme.

A potentially serious problem with estimating equation (2) as it stands is that the error term is likely to include unobservables (such as teaching quality and school ethos) which are correlated with the observed covariates, including the two education policy variables (Mayston, 2007; De Fraya, Oliveira and Zanchi, 2006). Our estimation strategy is therefore to include school fixed effects in the estimation equation in order to reduce this potential bias in the estimated impact of these two policies.[8] We therefore exploit the panel nature of our data and estimate a fixed effects model, as follows:

$$Y_{ist} = \alpha + \beta_1 PUP_{is} + \beta_2 FAM_{is} + \beta_3 SCH_{ist(a)} + \beta_4 SPEC_{ist} + \beta_5 EiC_{ist} + \mu_s + \varepsilon_{ist} \quad (3)$$

[8] An alternative strategy is to include pupil fixed effects in order to control for unobserved time-invariant pupil level factors such as innate ability. Results from this model are available from jim.taylor@lancaster.ac.uk in an extended working paper.

where the vector SCH now refers to time-varying and age-related school inputs; and μ_s are school level fixed effects, which capture the effect of unobserved, time-invariant, school level variables. This is our basic specification. Note, however, that we include 'fixed' pupil level characteristics, such as gender and ethnicity, in the model. In addition, gender and ethnicity are interacted with the two policy variables (*SPEC* and *EiC*) since we are interested in whether these policies had differential impacts on boys and girls in each ethnic group.

An alternative specification of Equation 3 is one that includes the lagged test score, $Y_{is,t-1}$, on the right-hand side. This model has the advantage that the lagged test score captures the history of omitted family and school inputs, but suffers from the fact that lagged test score is endogenous. Two further models have also been estimated in the literature, that is, a value added model whereby the left-hand side of equation 3 is replaced by $Y_{ist} - Y_{is,t-1}$, and a value added model with lagged test score included on the right-hand side. Results from the various formulations of the model are broadly similar, so we report only those obtained from equation (3) in this paper.[9]

3.2 Data and variables

The data used in this paper were obtained from two sources: the National Pupil Database (NPD) and the annual Schools' Census. Both datasets were obtained from the Department for Education and Skills and the data are for pupils who were in their final year of compulsory education in maintained (state-funded) secondary schools in England in 2003. The NPD provides pupil level data, such as test and exam results (at specified key stages), gender and ethnicity and it identifies the school attended at each key stage. The latter variable makes it possible to map in school-level data to incorporate variables such as school size, pupil / teacher ratio and other time-varying measures of school inputs.

In England, pupils are tested at four stages: key stage 1 (age 7/8), key stage 2 (age 10/11), key stage 3 (age 13/14) and key stage 4 (age 15/16). Key stage 2 refers to the final test taken during primary schooling and key stages 3 and 4 tests are taken during secondary schooling, which is the focus of this paper. The dependent variable is therefore constructed from test scores obtained by pupils at age 13/14 and age 15/16. At age 13/14, pupils sit tests in three subjects (English, maths and science) and the score used here is the average over the three subjects. Pupils in their final year of compulsory schooling at age 15/16 typically sit exams in up to ten GCSE and GNVQ subjects.[10] Once again, we calculate the average points score for each pupil.

The dependent variable used in the estimated regression equations (i.e. test score) is measured as a standard normal variable for two reasons. First, the test scores at key stages 3 and 4 are measured on entirely different scales and are therefore incompatible in their original form. Second, the

[9] The results obtained from these additional formulations of the model are available in a working paper and can be obtained from the corresponding author (jim.taylor@lancaster.ac.uk).

[10] GCSE refers to the General Certificate of Secondary Education and GNVQ is the General National Vocational Qualification. The test score in each subject is graded A* to G. These are converted to points and then summed across all subjects (A* = 8, A = 7, B = 6 to G = 1).

interpretation of the estimated coefficients is clearer when the relevant variables are standardised. The estimated impact of each policy is therefore measured in terms of the standard deviation of the test score.

Since it seems likely that a policy will take time to reach its full impact on educational outcomes, the two policy variables are measured in terms of the number of years a school has been 'under treatment' during the time that each pupil is in attendance at the specified school. For the Specialist Schools Initiative, a school could have had specialist status for up to five years by the time a pupil reached the end of key stage 4, depending on the year in which the school became specialist. The maximum period a school could have been in an EiC Partnership by 2003, however, is just four years since the first year of the programme was 1999/00 (which is the second year of secondary schooling for those reaching the end of compulsory schooling in 2003). The estimated impact of each policy will therefore be dependent on the number of years the school attended has been under treatment.

The explanatory variables of primary interest are those relating to the pupil's ethnic group and their gender. Seven groups are identified: whites, black Caribbeans, other Blacks including Africans, Indians, Pakistanis, Bangladeshis, and other ethnic.[11] The footnote to Table 1 identifies the time-varying family, neighbourhood and school covariates that are included as controls in the current paper.

4. Results

Two models have been estimated to investigate the relationship between education policies and test score during secondary schooling (at key stages 3 and 4). The first model provides an estimate of the overall impact of each policy variable (i.e. the Specialist Schools Initiative and the EiC Programme) on test score; the second model disaggregates the estimated policy impact by interacting each policy variable with ethnicity. The advantage of including the policy-by-ethnicity interaction terms is that different ethnic groups may vary in their response to the two policies. Separate analyses have also been undertaken for boys and girls.

Recall that each of the policy variables is expressed in terms of the number of years a school has been 'under treatment' during the pupil's time at the school (see section 4.2). An estimate of the long-run effect of each policy is therefore obtained by multiplying the estimated coefficients on the two policy variables by 5 and 4 respectively.

4.1 Estimated policy effects by gender and ethnicity

The Specialist Schools Initiative is estimated to have raised the test score by 0.02 (of a standard deviation) per year of operation for boys and 0.06 for girls (see Table 1). The long-run (5-year) impact of the specialist school's policy is therefore estimated to be 0.1 for boys and 0.3 for girls. By contrast,

[11] In a previous paper, we have shown that, after controlling for family background (such as parental occupation), school inputs and neighbourhood characteristics, pupils from Asian families perform substantially better in national exams than whites (Bradley and Taylor, 2004).

the estimated coefficient for the EiC Programme is not significantly different from zero for boys and 0.04 of a standard deviation for girls, which translates into a long-run (4-year) impact of the EiC Programme of 0.16 of a standard deviation for girls. The overall impact of the two policies therefore appears to have been substantially greater for girls than for boys. Girls appear to have been more responsive to these two policies than boys.

Since whites account for 86% of all pupils in the 2003 cohort, the aggregate coefficients on the two policy variables are dominated by the estimated impact on whites. It is therefore useful to investigate whether the policy impact varies between ethnic groups by interacting the policy variables with the ethnicity dummies (for boys and girls separately). Interacting the Specialist Schools Initiative with ethnicity, reveals that the estimated coefficients are statistically significant in only four cases for boys (see Table 1). The coefficient is not significantly different from zero for black Caribbeans, Pakistanis and Bangladeshis. By contrast, the estimated coefficients for girls are highly statistically significant for all ethnic groups, but are not significantly different from each other (varying between 0.05 and 0.08). These results indicate that the impact of the Specialist Schools Initiative was much stronger for girls than for boys across all ethnic groups but did not vary significantly between ethnic groups for girls. The Specialist Schools Initiative could therefore have contributed to the increase in the *gender* gap but not to the increase in the *ethnicity* gap during secondary schooling.

Interacting the *EiC* policy variable with ethnicity reveals substantial gender and ethnic differences in the responsiveness to the EiC Programme. With the exception of white boys, all of the estimated coefficients are statistically significant but are invariably greater for girls than for boys within each ethnic group (see Table 1). The coefficients also vary significantly between ethnic groups, with Asians (and especially Bangladeshis) generally having the largest coefficients for both boys and girls. The estimated coefficients for Indian and Pakistani girls, for example, suggest that the EiC Programme raised test scores by over 0.3 of a standard deviation compared to only 0.1 of a standard deviation for white girls (and zero for white boys). The general conclusion from these results is that the EiC Programme contributed to a widening of the gender gap in exam performance and to an improvement in the exam performance of Asians relative to whites.

It is also worth noting that adding the lagged test score to the regression equation had very little effect on the estimated policy effects. Similar policy effects were found when the test score *gain* was used as the dependent variable (both with and without the lagged test score as an additional explanatory variable).

4.2 Policy effects and poverty

Greater insight into the potential impact of the two policies can be obtained by controlling for whether or not a pupil's family is economically disadvantaged (as indicated by eligibility for free school meals). Divergent results are obtained for the two policies (see Table 2). In the case of the Specialist Schools Initiative, the estimated coefficients are greater for pupils who are *not* from poor families. Once again, the estimated policy impact differs substantially between boys and girls. None of the

estimated coefficients for boys from poor families is statistically significant and only the coefficients for Pakistani and Bangladeshi girls are significant. These results therefore suggest that the Specialist Schools Initiative had very little impact on pupils from poor families. The benefits accrued almost entirely to pupils from less disadvantaged family backgrounds.

The results obtained for the *EiC* policy are very different to those obtained for the Specialist Schools Initiative. Virtually all of the estimated coefficients on the ethnicity interaction terms are statistically significant, the only exceptions being those for white and black boys (see Table 2). Moreover, for both boys and girls, the coefficients are invariably larger (significantly so in many cases) for those pupils whose parents are economically disadvantaged. This is especially the case for ethnic minority pupils. These results therefore add further support to the view that whereas the Specialist Schools Initiative favoured pupils (and especially girls) from less disadvantaged backgrounds, the *EiC* policy was more effective, unsurprisingly, in raising test scores for disadvantaged pupils.

4.3 Policy effects and pupil ability

A further dimension of the two education reforms worthy of investigation is the differential impact of the two policies according to pupil ability. This is particularly pertinent for the EiC Programme, which was specifically designed to reach both low ability and high ability pupils in deprived urban areas. Extra resources were targeted at two main groups: the 'hard to teach' at the bottom end of the ability range and the 'gifted and talented' at the top end of the ability range. If these two strands of the *EiC* policy had been successful, we would expect the estimated coefficients on the *EiC* policy variable to be larger in the top and bottom quintiles of the initial attainment distribution than for those pupils in the middle quintiles. Table 3 therefore presents estimates separately for pupils in the lowest and highest quintiles of the initial test score distribution (i.e. at key stage 2).

Two main findings are apparent for the EiC Programme. First, with the exception of Bangladeshis, the estimated coefficients were higher for low ability pupils than for high ability pupils for both boys and girls. Second, for most ethnic groups, the estimated coefficients for the middle three quintiles of the initial test score distribution were lower than for the pupils in the bottom and top quintiles, especially for females. This dip in the coefficients for the middle three quintiles supports the notion that the *EiC* policy benefited the extremes of the ability distribution more than the pupils of average ability, as indeed the policy was designed to do.

As far as the Specialist Schools Initiative is concerned, the estimated impact is greater for girls than for boys across the ability range. There is also evidence that high ability pupils benefited far more than low ability pupils for both boys and girls. The targeting of extra resources on specialist schools is therefore estimated to have had greater benefits for the most able pupils, especially girls. Once again, disaggregating pupils into identifiable groups reveals statistically strong (and highly significant) relationships between the two policies and pupil attainment that are not apparent from aggregated data.

5. Conclusion

The aim of this paper has been to estimate the impact of two important policies on the educational attainment of secondary school pupils in England: the Specialist Schools Initiative and the Excellence in Cities Programme. A comparison of the relative effectiveness of these two policies is of interest since they have depended on similar amounts of funding but were based on entirely different approaches to achieving the same objective, namely, to raise educational attainment. Thus, whereas the Specialist Schools Initiative attempted to raise attainment through increasing diversity and thus increased choice for pupils, the EiC Programme was designed to raise attainment by providing more educational support to pupils living in economically deprived inner city areas.

A comparison of the relative impact of these two policies is particularly relevant given that they have been consciously directed at different pupil groups. Whereas the Specialist Schools Initiative has favoured schools with above average levels of initial attainment, the EiC Programme has favoured schools with a high proportion of pupils living in economically deprived inner city areas. The two primary questions we have addressed are 'how effective have these two policies been?' and 'who has benefited the most from these policies?'

The research reported in this paper has focused specifically on the effectiveness of these two policies on the educational attainment of boys and girls in each major ethnic group. An investigation of gender and ethnic disparities in the impact of education policies is pertinent in view of the substantial disparities in educational outcomes between boys and girls and between different ethnic groups, particularly during the final two years of compulsory education.

An important feature of the research reported in this paper is that it clearly demonstrates the advantages of disaggregating the estimation of policy effects by gender and ethnicity, at least in the case of the two policies of interest in this paper. We find that confining the analysis to the aggregate impact of these two policies hides substantial gender and ethnic disparities in the response to policy initiatives, especially in the case of the EiC Programme. So, what have the distributional effects of the specialist schools and EiC policies been? The main findings of this paper are as follows:

1. Both policies are estimated to have had a far greater impact on test scores for girls than for boys, thus exacerbating the educational gender gap.
2. The disaggregated policy impacts indicate that the Specialist Schools Initiative was more effective for girls than for boys for all ethnic groups.
3. Although the EiC Programme is estimated to have had no impact on test scores for boys overall, interacting the *EiC* policy variable with each ethnic group reveals a positive impact for boys in several ethnic groups.
4. The EiC Programme has stronger effects across all ethnic groups on test scores for girls than for boys, and is particularly strong for Asian girls.
5. The Specialist Schools Initiative is strongly biased in favour of pupils who are *not* eligible for free school meals, that is, 'advantaged' pupils. The opposite result is obtained for the EiC Programme,

which is estimated to have had a much stronger impact on pupils eligible for free school meals, particularly so for ethnic minority pupils.

6. Finally, whereas the Specialist Schools Initiative favoured pupils with high initial test scores, the EiC Programme had its greatest impact on pupils at the top and bottom ends of the initial test score distribution, as indeed it was designed to do.

In comparing the overall impact of the two policies on test scores, our main finding is that the EiC Programme has been substantially more effective in helping to raise the educational attainment levels of ethnic minority pupils, particularly Asians, than the Specialist Schools Initiative, which has favoured pupils with the highest levels of attainment prior to entering secondary education. The EiC Programme can therefore be regarded as largely successful in achieving its objective of raising the educational outcomes of pupils from economically deprived areas, whereas the Specialist Schools Initiative has been largely regressive.

The next step in this research programme is to confirm the results reported in the present paper by using a longer time-series of data from the National Pupil Database (NPD). A further and more ambitious task would be to discover why girls have responded to recent education policies much more positively than boys, and why Asian pupils have been more responsive to education policies than white and black pupils. Finally, we need to find out why white and black pupils from the poorest families have failed to respond to policy initiatives since it is these two teenage groups which now require the closest attention from education policy makers if the intergenerational transfer of social deprivation is to be significantly reduced.

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Table 1 Estimated effects of the Specialist Schools and EiC Programmes on test score: by gender and ethnicity

	Dependent variable = test score at the end of Key Stages 3 and 4			
	Boys		Girls	
Policy variables				
Specialist status	0.021**		0.063***	
	(0.008)		(0.008)	
EiC status	-0.003		0.038***	
	(0.007)		(0.008)	
Ethnicity x specialist school status				
White x specialist status		0.022***		0.051***
		(0.006)		(0.006)
Black Caribbean x specialist status		0.012		0.059***
		(0.013)		(0.013)
Other Black x specialist status		0.033**		0.059***
		(0.013)		(0.012)
Indian x specialist status		0.042***		0.062***
		(0.012)		(0.012)
Pakistani x specialist status		0.025		0.073***
		(0.014)		(0.015)
Bangladeshi x specialist status		0.035		0.080***
		(0.021)		(0.016)
Other ethnic x specialist status		0.040***		0.067***
		(0.012)		(0.011)
Ethnicity x EiC status				
White x EiC status		-0.007		0.024***
		(0.006)		(0.006)
Black Caribbean x EiC status		0.031**		0.050***
		(0.010)		(0.012)
Other black x EiC status		0.037***		0.071***
		(0.011)		(0.011)
Indian x EiC status		0.048***		0.081***
		(0.012)		(0.013)
Pakistani x EiC status		0.060***		0.086***
		(0.012)		(0.012)
Bangladeshi x EiC status		0.093***		0.156***
		(0.017)		(0.016)
Other ethnic x EiC status		0.043***		0.075***
		(0.010)		(0.011)
Constant	-0.242	-0.251	0.013	0.063
	(0.144)	(0.140)	(0.141)	(0.136)
R^2	0.32	0.32	0.31	0.31
Number of observations	472433	472433	470095	470095

Notes:
( ) = standard errors. The standard errors of the regression coefficients were estimated using the Huber-White robust estimator, which allows for the errors of the within-school clusters of pupils to be correlated while assuming independence of the between-school errors. All estimated equations include school fixed effects in addition to the following time-varying *school level* controls (current and lagged values): proportion of pupils in schools eligible for free school meals, proportion white, proportion with second language English, proportion authorised absence, proportion unauthorised absence, proportion special needs (statemented), proportion special needs (not statemented). The individual (time-constant) *pupil level* controls are as follows: age, ethnicity (Black Caribbean, other black, Indian, Pakistani, Bangladeshi, other ethnic), English second language during primary school, special needs (statemented), special needs (not statemented), whether changed school after end of key stage 3, duration in school up to key stage 4 exam. The full set of results is available in a working paper (contact jim.taylor@lancaster.ac.uk).

Table 2 Estimated effects of the Specialist Schools and EiC Partnership Programmes on test score: by gender, ethnicity and eligibility for free school meals

	Dependent variable = test score at the end of Key Stages 3 and 4			
	Boys		Girls	
	Not eligible for FSM	Eligible for FSM	Not eligible for FSM	Eligible for FSM
Ethnicity x specialist school status				
White x specialist status	0.027***	-0.020	0.057***	0.005
Black Caribbean x specialist status	0.019	-0.018	0.075***	0.002
Other Black x specialist status	0.035*	0.024	0.060***	0.041
Indian x specialist status	0.047***	0.015	0.071***	0.001
Pakistani x specialist status	0.031*	0.012	0.074***	0.067***
Bangladeshi x specialist status	0.025	0.044	0.053*	0.086***
Other ethnic x specialist status	0.046***	0.015	0.077***	0.023
Ethnicity x EiC status				
White x EiC status	-0.006	0.005	0.025***	0.038***
Black Caribbean x EiC status	0.021	0.052***	0.032*	0.094***
Other black x EiC status	0.022	0.075***	0.051***	0.123***
Indian x EiC status	0.042***	0.079***	0.076***	0.109***
Pakistani x EiC status	0.054***	0.084***	0.062***	0.136***
Bangladeshi x EiC status	0.066***	0.116***	0.109***	0.195***
Other ethnic x EiC status	0.029*	0.086***	0.062***	0.117***
Constant	-0.155	-1.072	0.127	-0.521
Controls included?	Yes	Yes	Yes	Yes
R^2	0.29	0.30	0.27	0.31
Number of observations	409743	62690	404349	65746

See notes to Table 1.

Table 3 Estimated effects of the Specialist Schools and EiC Partnership Programmes on test score: by gender, ethnicity and prior attainment

	Dependent variable = test score at the end of Key Stages 3 and 4					
	Prior attainment: boys			Prior attainment: girls		
	Low	Medium	High	Low	Medium	High
Ethnicity x specialist school status						
White x specialist status	0.001	0.013	0.054***	0.038***	0.046***	0.073***
Black Caribbean x specialist status	0.004	0.016	0.019	0.082***	0.046***	0.105***
Other Black x specialist status	0.015	0.025	0.063***	0.056**	0.064***	0.085***
Indian x specialist status	0.029	0.045***	0.060***	0.055**	0.066***	0.109***
Pakistani x specialist status	0.022	0.019	0.050*	0.071***	0.073***	0.097**
Bangladeshi x specialist status	0.064*	0.028	0.003	0.083***	0.101***	0.047
Other ethnic x specialist status	0.034	0.024*	0.083***	0.080***	0.061***	0.073***
Ethnicity x EiC status						
White x EiC status	0.035***	-0.023***	0.003	0.069***	0.006	0.034***
Black Caribbean x EiC status	0.088***	-0.003	0.050*	0.130***	0.035**	0.024
Other black x EiC status	0.107***	0.008	0.044*	0.160***	0.030**	0.100***
Indian x EiC status	0.103***	0.037**	0.035	0.159***	0.067***	0.051*
Pakistani x EiC status	0.100***	0.037**	0.084***	0.158***	0.060***	0.083***
Bangladeshi x EiC status	0.099***	0.078***	0.125***	0.198***	0.098***	0.210***
Other ethnic x EiC status	0.072***	0.030**	0.039*	0.132***	0.062***	0.061***
Constant	-0.949	-0.177	0.133	-0.660	0.154	0.252
Controls included?	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.22	0.19	0.50	0.26	0.18	0.47
Number of observations	87894	268956	115583	82030	275321	112744

See notes to Table 1.

Appendix

Table A Descriptive statistics

	2001				2003			
	Boys		Girl		Boys		Girls	
Variable	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Proportion pupils eligible for free school meals (lagged)	0.14	0.14	0.14	0.14	0.14	0.13	0.14	0.13
Proportion of pupils with English second language (lagged)	0.08	0.18	0.08	0.17	0.08	0.16	0.08	0.17
Proportion pupils special needs not statemented (lagged)	0.15	0.10	0.15	0.10	0.16	0.11	0.15	0.10
Proportion pupils special needs statemented (lagged)	0.04	0.09	0.03	0.07	0.04	0.11	0.03	0.08
Proportion pupils white (lagged)	0.88	0.21	0.88	0.21	0.88	0.21	0.88	0.21
Black Caribbean	0.01	0.11	0.01	0.11	0.01	0.11	0.01	0.11
Black other	0.02	0.12	0.02	0.13	0.02	0.12	0.02	0.13
Indian	0.02	0.15	0.02	0.15	0.02	0.15	0.02	0.15
Pakistani	0.02	0.15	0.02	0.15	0.02	0.15	0.02	0.15
Bangladeshi	0.01	0.09	0.01	0.09	0.01	0.09	0.01	0.09
Other ethnic	0.02	0.15	0.02	0.15	0.02	0.15	0.02	0.15
Proportion pupils authorised absence (current)	0.08	0.02	0.08	0.02	0.07	0.02	0.07	0.02
Proportion pupils unauthorised absence (current)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Number pupils in school (current)	10.93	3.38	10.96	3.33	11.23	3.44	11.29	3.39
Pupil / teacher ratio (current)	17.26	1.77	17.22	1.62	17.40	2.05	17.37	1.89
Proportion pupils special needs, statemented (current)	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Proportion pupils special needs, not statemented (current)	0.17	0.09	0.17	0.09	0.13	0.08	0.13	0.08
Proportion pupils eligible for free school meals (current)	0.16	0.13	0.16	0.13	0.14	0.13	0.14	0.13
Proportion pupils white (current)	0.87	0.21	0.86	0.21	0.84	0.25	0.84	0.25
Whether changed school after end of Key Stage 3	0.00	0.00	0.00	0.00	0.02	0.15	0.02	0.15
Pupil eligible for free school meals	0.14	0.35	0.15	0.35	0.14	0.35	0.15	0.35
English second language during primary school	0.08	0.18	0.08	0.17	0.08	0.18	0.08	0.17
Pupil has special needs, not statemented	0.19	0.39	0.12	0.32	0.19	0.39	0.12	0.32
Pupil has special needs, statemented	0.05	0.21	0.02	0.14	0.05	0.21	0.02	0.14
Duration in school up to Key Stage 4 exam	4.41	0.80	4.40	0.81	4.41	0.80	4.40	0.81
Birth month (Sept = 1)	5.37	3.48	5.39	3.47	5.37	3.48	5.39	3.47

Figure 1 The gender gap in test scores at three key stages: girls score / boys score

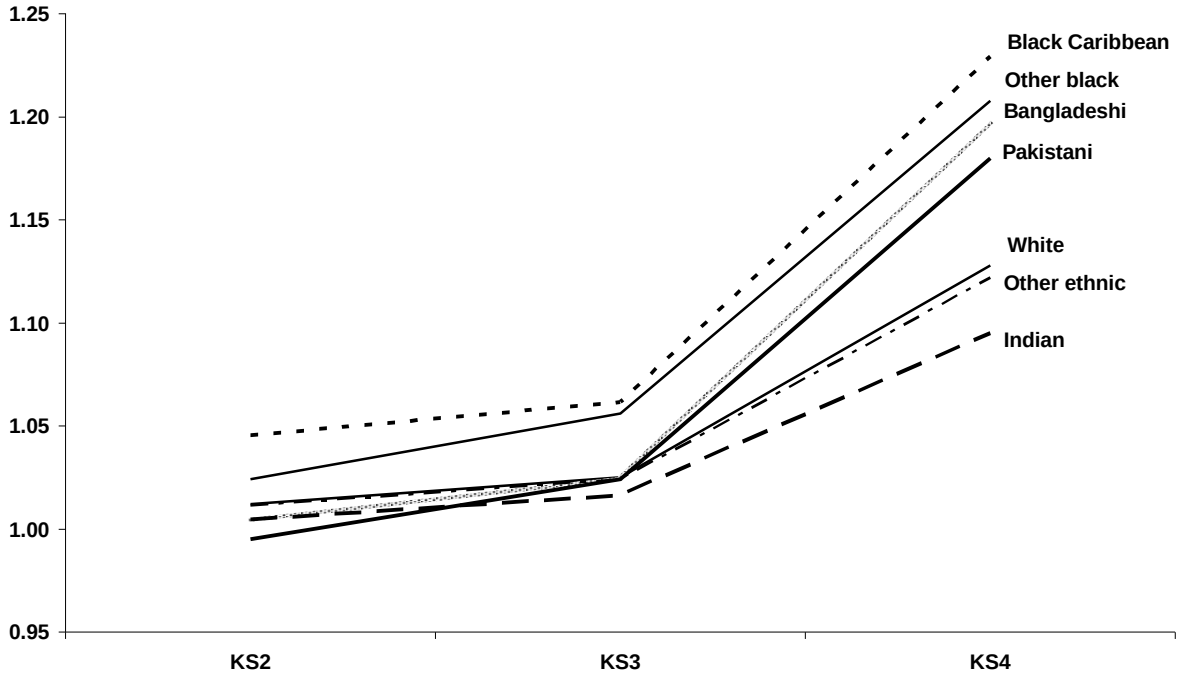

Figure 2 Index of test scores for boys

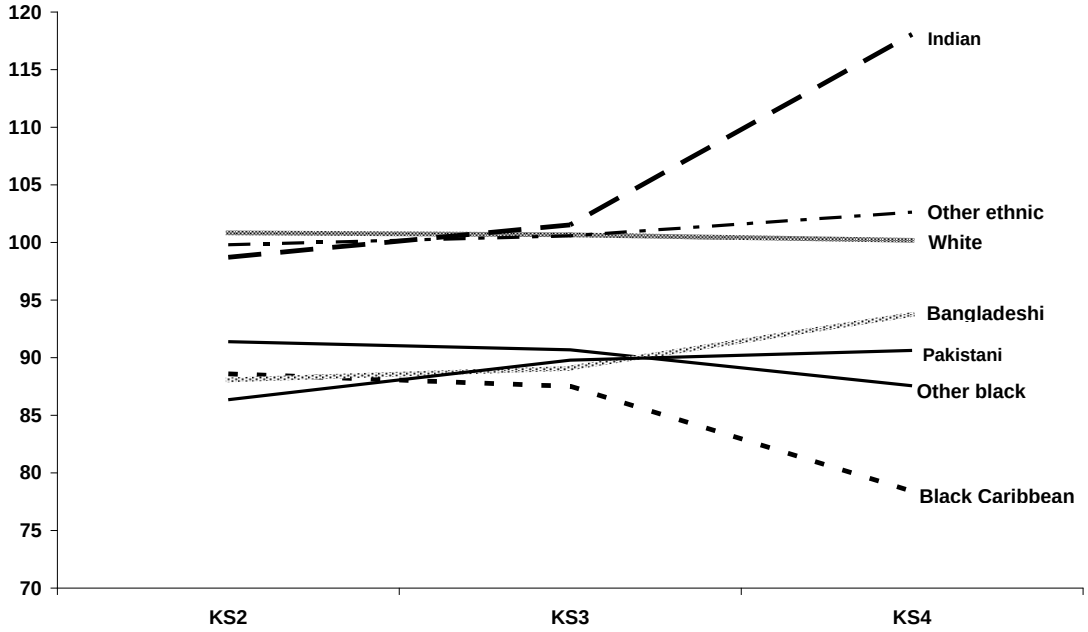

Figure 3 Index of test scores for girls