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

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This paper estimates the impact of 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 and ethnic groups. Using pupil-level data, we find that both policies have had positive effects on test score gain but that these effects vary substantially between boys and girls and across ethnic groups. Both policies have been more effective for boys than for girls. The Excellence in Cities programme is estimated have had a positive impact on the test score gain of ethnic minority pupils but not for whites, who have benefited only from the Specialist Schools initiative. The greatest impact is estimated to have occurred for schools which have had specialist and EiC status simultaneously.

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 public expenditure on education 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 educational achievement, and hence achieve 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 (Hanushek 2003, Krueger 2003). 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 by greater parental choice, delegation of expenditure decisions to schools, competition for pupils between schools thereby 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

[2] For the OECD as a whole, public 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 in 1995 to 119 in 2005 (2000=100) 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 public expenditure on secondary schools in England 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*, p.102 and *Annual Report 2008*, p.150, annex N.

provided extra resources to schools in the form of capital grants and increased recurrent spending. The 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.

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 Levacic and Jenkins (2004) and by Taylor (2007), while the EiC programme has been the focus of papers by Kendall *et al*. (2005) and Machin, McNally and Meghir (2007).[4] 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 in two directions. First, we use pupil-level data. Second, we estimate the impact of the two policies on pupils in schools with only specialist status, schools with only EiC status and schools with both specialist and EiC status simultaneously. This approach should help to ascertain which, if any, of the two policies has been successful in raising attainment, and whether there have been any advantages in schools having both policies rather than just one.

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 disparities in attainment is the considerable widening that occurs during the final two years of compulsory education, as shown in Figure 1. 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 and ethnicity. 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

[4] Papers published in education journals include Gorard (2002), Levacic and Jenkins (2004), Schagen and Goldstein (2002) and Noden and Schagen (2006).

poor families.[5] We therefore seek to discover not only the extent to which these two policies have been effective in raising overall test scores but also their gender and ethnic impacts.

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

Despite their high profile, there have been few comprehensive evaluations of the Specialist Schools initiative and the EiC programme. This section briefly reviews some of the main attempts at estimating the impact of these two policies on test scores and exam results.

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.[6] The original aim was that all secondary schools in England would eventually have specialist status (Levacic 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 have been 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. The requirement to obtain matched private sector funding to supplement the initial capital grant resulted in a strong funding bias 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 'poor' exam results (and a correspondingly high proportion of pupils from families on income support) were far less likely to acquire specialist status in earlier years since private capital endowments have favoured schools with 'good' exam results (Bradley and Taylor, 2008). The selectivity of specialist schools is evident from Table 1, which shows that specialist schools had the lowest proportion of

[5] 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 of pupils eligible for free school meals were 35.6% for participants in the programme and 14.7% for non-participants.

[6] The specialisms were introduced as follows: technology colleges in 1994, languages in 1995; arts and sport in 1997; business & enterprise, engineering, maths & computing, and science in 2002; and humanities and music in 2004. A vocational specialism was added in September 2007 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 for further details: http://www.standards.dfes.gov.uk/specialistschools/.

pupils eligible for free school meals, the lowest proportion of non-white pupils and the highest test score at the end of primary schooling (in the 2003 cohort of pupils).

There is conflicting evidence on the success of the Specialist Schools initiative. Evidence of a positive effect of specialist status on exam performance is provided, for example, in studies commissioned by the Specialist Schools Trust (Jesson and Crossley, 2004) and by 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.[7] 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 studies suffer from a fundamental flaw: 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 being based on simple cross-sectional analyses at a point in time, it is estimated that the Specialist Schools initiative raised exam results by around one percentage point on average (compared to the claim of between 4 and 5 percentage points by the Specialist Schools Trust), though there is evidence of more substantial impacts for specific areas of specialisation, such as business studies and technology.

2.2 EiC Partnerships

In contrast to the Specialist Schools initiative, the *EiC* policy explicitly targets pupils from disadvantaged backgrounds, especially in metropolitan areas (see Table 1). Launched in 1999, the programme initially 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).[8] 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 focused on the most able 5-10% of pupils in schools supported by the EiC programme. The aim of the programme has been to improve attainment by raising the motivation and expectations of pupils through providing more personal support to pupils and changing the ethos of low attaining schools.

There have been relatively few attempts, however, to evaluate the impact of the EiC programme. In a comprehensive review, Kendall *et al*. (2005) conclude that the programme created a

[7] See also the comprehensive evaluation by Levacic and Jenkins (2004).
[8] See 'EiC 1999-2006' on the Standards Site, DCSF (http://www.standards.dcsf.gov.uk/sie/eic/) for more information about the programme.

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) indicate 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 test score in English. Two further findings by Machin *et al*. are, first, that the EiC policy has become more effective over time (as phases 1, 2 and 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 (2009) using a panel of secondary schools in England over the period 1993-2006. They estimate that the EiC programme 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 Machin *et al*., 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). We begin with the following general form:

$$Y_{is} = f(\mathbf{P}_{is}, \mathbf{F}_{is}, \mathbf{S}_{s}) \qquad (1)$$

where Y refers to test score of pupil i in school s; **P** indexes observed pupil characteristics, such as gender and ethnicity; **F** refers to family characteristics, such as whether a pupil's parents receive income support; and **S** represents a set of school inputs, such as the pupil-teacher ratio or whether a school is coeducational.

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

$$Y_{is} = f(\mathbf{P}_{is}, \mathbf{F}_{is}, \mathbf{S}_{s}, SPEC_{s}, EiC_{s}) \qquad (2)$$

where *SPEC* refers to whether a school had specialist status during the pupil's time at the school. *EiC* has an equivalent definition with respect to *EiC* status. Both *SPEC* and *EiC* are binary variables indicating whether a school had specialist or EiC status during the year in which the test was taken. 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. The extra funding provided under the EiC programme was targeted at schools

with a high proportion of pupils from disadvantaged backgrounds, particularly in inner city metropolitan areas. The aim was to improve the exam performance of pupils in 'poor' schools through providing extra teaching and mentoring resources. We therefore expect the EiC programme to have a positive effect on the exam performance of pupils. Since Britain's ethnic minority population tends to be clustered in the poorest inner city areas, we expect these pupils to benefit most from the EiC programme.

A pupil's educational development, however, is a cumulative process, influenced by the history of family and school inputs as well as unobserved inherited endowments. Since family history and other relevant explanatory variables are not normally observed in survey data, prior attainment is often included on the right hand side to capture these missing variables. The inclusion of prior attainment as an explanatory variable, however, is likely to cause estimation problems due to endogeneity (Todd and Wolpin, 2003, 2007). This may be compounded by measurement error embodied in indicators of achievement used in empirical studies, such as test scores. An alternative measure of attainment that is likely to present fewer estimation problems is test score *gain* (i.e. value added) during secondary schooling (Hanushek *et al*. 2005). Using test score gain as the dependent variable means that the explanatory variables can be restricted to those likely to influence the acquisition of knowledge *during* secondary schooling. Following Hanushek *et al*. (2005), our educational attainment model therefore focuses on the relationship between test score gain and the flow of inputs during secondary schooling. Focusing on the *gain* in a pupil's attainment during secondary schooling rather than on the *level* of attainment will automatically control for the impact of any time-constant determinants of attainment. Controlling for fixed pupil level effects should therefore help to provide more reliable estimates of the impact of the Specialist Schools initiative and the EiC programme on attainment during secondary schooling.

Using test score gain to measure attainment is not, however, problem-free. Test score gain is likely to be greater for those with a low initial test score than for those with a high initial test score due to mean reversion resulting from measurement error. The fact that the test score is bounded will exacerbate the mean reversion problem since pupils with low initial test scores have nowhere to go but up, whereas those with high initial test scores have nowhere to go but down.[9] One way of dealing with this problem is to calculate a decile-standardised measure of test score gain (see Hanushek *et al*. 2005). This involves calculating a separate standardised test score gain for each decile in the initial attainment distribution so that individual pupils are compared not with all pupils in the sample but only with pupils in the same part of the initial attainment distribution as themselves.

Assuming a linear relationship between test score gain (*Gain*) and the explanatory variables, our test score gain model is as follows:

$$Gain_{is} = \alpha + \mathbf{P}_{is}\boldsymbol{\beta}_1 + \mathbf{F}_{is}\boldsymbol{\beta}_2 + \mathbf{S}_{s}\boldsymbol{\beta}_3 + \beta_4 SPEC_s + \beta_5 EiC_s + \varepsilon_{is} \qquad (3)$$

[9] This is confirmed by the highly significant negative correlation between the raw (unstandardised) test score gain and the initial level of attainment in our dataset (r = -0.43).

where the error term ε captures the effect of unobservables as well as measurement error in the test score. Our interest in this paper is focused entirely on β_4 and β_5. The regressions are estimated separately for boys and girls since it is possible that the impact of policy measures may differ by gender. In addition, ethnicity is interacted with the two policy variables (*SPEC* and *EiC*) since we are interested in whether these policies had differential impacts across ethnic groups. [10]

A further modification to our estimation strategy is to select a control group that includes only 'untreated' schools. The test score gain of pupils in treated schools is therefore compared directly with the test score gain of pupils in untreated schools, which comprised around 50% of all schools in 2003 (see Table 2). We note that the test score gain varied markedly between the policy categories. Table 3 shows that the test score gain was highest on average for schools with specialist status and lowest for schools with EiC status. Since some schools were treated with only one of the two policies while others were treated with both policies simultaneously, the impact of the two policies is estimated separately for the Specialist Schools initiative and the EiC programme as well as for the simultaneous impact of these two policies.[11] In addition, policy effects are estimated for boys and girls separately so that the control group includes only pupils of the same gender in both cases. Boys in schools in each policy category are therefore compared only with boys in the control group of untreated schools; and similarly for girls.

3.2 Data and variables

The data used in this paper were obtained from two primary sources: the National Pupil Database (NPD) and the annual Schools' Census. Both datasets were obtained from the Department for Children, Schools and Families (DCSF) 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.[12] The NPD provides pupil level data, such as test scores (at specified Key Stages), as well as personal and family background variables such as gender, ethnicity, eligibility for free school meals and whether a pupil has special educational needs. In addition, the NPD identifies the school attended at each Key Stage. This makes it possible to incorporate school-level variables in the regression model, such as the pupil / teacher ratio, a school's admissions policy, the proportion of pupils eligible for free school meals, the proportion with special educational needs and the proportion with English as their second language.

In England, pupils are tested at five Key Stages: Key Stage 1 (age 7/8), Key Stage 2 (age 10/11), Key Stage 3 (age 13/14), Key Stage 4 (age 15/16) and Key Stage 5 (17/18). Key Stage 2 refers

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

[11] Equation (3) was also estimated using a more restricted control group. Schools were selected for inclusion in the control group only if their test score (at the end of Key Stage 2 in the year preceding the entry of the 2003 cohort into secondary schooling) was within one standard deviation of the mean of the test score in the relevant treated group of schools. The results were found to be very similar in most cases and the conclusions are unaffected by the amendment. These additional results are available in working paper.

[12] Data on specialist schools and EiC status were obtained from the DCSF website.

to the tests taken at the end of primary schooling and Key Stage 3 and 4 tests are taken during secondary schooling, which is the focus of this paper.[13] The Key Stage 4 test (known as the GCSE/GNVQ[14]) is particularly salient since it determines whether a pupil stays on in further (and hence higher) education. The dependent variable is therefore constructed from test scores obtained by pupils at ages 13/14 and 15/16. At age 13/14, pupils sit tests in three subjects (English, maths and science) and the test score used here is the average points score over the three subjects. Pupils in their final year of compulsory schooling at age 15/16 typically sit exams in up to ten subjects. Once again, we calculate the average points score for each pupil. Since the test scores for Key Stages 3 and 4 are measured on entirely different scales, the scores at each Key Stage have to be normalised (with mean zero and standard deviation one) before calculating the test score gain for each pupil between Key Stages 3 and 4. Finally, the test score gain is then divided into deciles and the test score gain *within* each decile is then normalised (following Hanushek *et al*. 2005). The variables used in the regression analysis are shown in Table A in the appendix.

4. Results

This section presents the estimated impact of the specialist schools and EiC policies on test score gain during the final two years of compulsory education, using pupil and school level data for those pupils who completed compulsory education in 2003. Policy impacts are estimated for: (i) pupils in schools with only specialist status, (ii) pupils in schools with only EiC status, and (iii) pupils in schools with both specialist and EiC status simultaneously (all during a pupil's final two years of compulsory schooling). In all three cases, pupils in treated schools are compared with pupils in schools which did *not* have either specialist or EiC status (namely, untreated schools). Estimates are provided for boys and girls separately. We note initially that the *difference* in test score gain between pupils in treated schools and pupils in non-treated schools was greater for boys than for girls across virtually all ethnic groups (see Table 4). This provides an additional justification for undertaking a separate analysis for boys and girls.

The estimated policy impact for all pupils is provided in Table 5. The main points to note are, first, that the specialist schools policy is positively related to test score gain for all ethnic groups (but is statistically insignificant for Pakistanis and Bangladeshis) with an estimated impact on test score gain of around 0.14 of a standard deviation for the significant coefficients. Second, the EiC policy is significantly related to test score gain for all ethnic groups except whites and Indians, with the estimated impact reaching 0.14 and 0.19 of a standard deviation for Pakistanis and Bangladeshis respectively. The EiC policy appears to have had no impact on whites and Indians. Third, the strongest

[13] The tests taken at the end of Key Stage 3 were abolished after the 2008 tests due to criticisms that these were harmful to the teaching process. The other Key Stage tests and exams have been retained.

[14] 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 and so on to G = 1).

policy impacts are estimated to have occurred for ethnic minority pupils in schools which had both specialist and EiC status simultaneously.

We note that the estimated coefficients on the variables used as controls are consistent with previous studies. The estimated coefficient on the gender dummy, for example, indicates that the test score gain for girls exceeded that for boys by around one quarter of a standard deviation. We also note that the test score gain for all ethnic minority groups is significantly larger than for whites once controls for other family characteristics (such as eligibility for free school meals and whether a pupil has special educational needs) are included in the regression model. These results are similar to those found in earlier studies, so we do not discuss them further here (Bradley and Taylor 2004).

The results for boys and girls separately are given in Table 6. Test score gain is positively related to specialist schools status across all ethnic groups for boys, with the largest estimated impact being for black Caribbeans (0.23). This positive impact of specialist schools on test score gain for boys contrasts sharply with the results obtained for girls. A statistically significant impact of specialist status on test score gain is obtained only for white and Indian girls and not for any other ethnic group. The estimated impact of the EiC policy is also estimated to vary by gender and ethnic group. For boys, the main impact of the EiC policy has been on blacks and Pakistanis, whereas for girls, the main impact has been on Pakistanis and Bangladeshis. There is no evidence, however, that either whites or Indians benefitted from the EiC policy.

The strongest impact of the two policies is estimated to have occurred for pupils in schools which have had both specialist and EiC status simultaneously. The evidence is particularly strong for boys. The estimated impact of the two policies, for example, is at least 0.2 of a standard deviation for boys in all ethnic minority groups, rising to over 0.34 standard deviations for blacks and Bangladeshis. The estimated impact of the two policies when used together is less impressive for girls, with the exception of Bangladeshis.

Our main conclusions from the regression analysis are as follows. First, the estimated policy impact on test score gain of both the specialist schools and EiC policies has been greater for boys than for girls. Boys therefore appear to have responded more positively to both policies than has been the case for girls. Second, EiC status appears to have had a consistently positive effect on test score gain except for whites and Indians, both of whom have benefited more from specialist status than from EiC status. Third, the estimated joint impact of the two policies is generally in line with the sum of the two separate impacts. We have found no evidence of any scale economies resulting from having specialist and EiC status simultaneously.

5. Conclusion

The aim of this paper has been to estimate the impact of the Specialist Schools initiative and the Excellence in Cities programme on the educational attainment of secondary school pupils in England. 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 at the end of compulsory education. Thus, whereas the Specialist Schools initiative attempted to raise attainment through increasing the diversity between schools, thereby increasing 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. In view of the wide variation in educational outcomes between boys and girls in different ethnic groups, this paper has focused specifically on gender as well as ethnic differences in the consequences of the Specialist Schools initiative and the EiC programme.

The two primary questions we have addressed are 'how effective have these two policies been?' and 'who has benefited the most from these policies?' In answer to the first question, we have found that both the Specialist Schools initiative and the EiC programme are estimated to have had a positive impact on the test score gain during the final two years of compulsory education. The estimated impact, however, differs between boys and girls and between ethnic groups. Our main findings are as follows: (i) the estimated impact of the Specialist Schools initiative has generally been greater for boys than for girls; (ii) the estimated impact of the EiC programme has been mixed, with blacks and Pakistanis benefitting the most for boys, and Pakistanis and Bangladeshis benefitting the most for girls; (iii) the EiC programme had no discernible impact on whites or Indians; (iv) no evidence could be found of any scale economies for those schools which had both specialist and EiC status. An interesting next step would be to investigate the reasons lying behind the differential gender and ethnic responses to these two key policy initiatives.

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TABLE 1 Characteristics of schools by policy category, 2003 cohort

Characteristics of schools	Policy category			
	SS = 0 EiC = 0	SS = 1 EiC = 0	SS = 0 EiC = 1	SS = 1 EiC = 1
Proportion of pupils eligible for free school meals	0.11 (0.32)	0.09 (0.28)	0.27 (0.44)	0.23 (0.42)
Proportion of pupils white	0.90 (0.30)	0.91 (0.28)	0.75 (0.43)	0.76 (0.43)
Key Stage 2 test score (standard normal)	0.02 (1.00)	0.11 (0.97)	-0.17 (1.01)	-0.05 (1.02)

Notes: ( ) = standard deviation; SS = Specialist Schools initiative; EiC = Excellence in Cities Partnership; 0 = policy-off, 1 = policy-on.

TABLE 2 Number of schools (pupils) in each policy category during Key Stage 4 (2003) , 2003 cohort

	Specialist Schools initiative		
	Policy-off (SS=0)	Policy-on (SS=1)	Total
EiC Programme			
Policy-off (EiC=0)	1,570 (249,633)	670 (135,272)	2240
Policy-on (EiC=1)	637 (98,238)	251 (50,991)	888
Total	2207	921	3128

Notes: ( ) = number of pupils; SS = Specialist Schools initiative; EiC = Excellence in Cities Partnership; 0 = policy-off, 1 = policy-on.

TABLE 3 Test score gain during Key Stage 4: by policy category, 2003 cohort

Policy category	Number of pupils	Test score gain during Key Stage 4
Boys		
SS=0, EiC=0	111,989	-0.18
SS=1, EiC=0	62,047	-0.01
SS=0, EiC=1	43,314	-0.22
SS=1, EiC=1	21,902	-0.07
All boys	239,252	-0.13
Girls		
SS=0, EiC=0	110,075	0.09
SS=1, EiC=0	62,250	0.24
SS=0, EiC=1	43,456	0.06
SS=1, EiC=1	24,107	0.18
All girls	239,888	0.13

Notes: SS = Specialist Schools initiative; EiC = Excellence in Cities Partnership; 0 = policy–off, 1 = policy-on.

TABLE 4 Difference in test score gain between pupils in treated and non-treated schools: by policy category and gender, 2003 cohort

	Difference in test score gain between treated & non-treated schools								
	Boys			Girls			Difference (Boys – Girls)		
	SS-NT	EiC-NT	(SS+EiC) -NT	SS-NT	EiC-NT	(SS+EiC) -NT	SS-NT	EiC-NT	(SS+EiC) -NT
White	0.16	-0.12	0.03	0.15	-0.11	0.02	0.01	-0.01	0.01
Black Caribbean	0.24	0.13	0.29	0.08	-0.01	0.10	0.16	0.14	0.19
Black African	0.18	0.12	0.26	0.10	0.00	0.15	0.08	0.12	0.11
Indian	0.22	0.01	0.17	0.14	0.00	0.05	0.08	0.01	0.12
Pakistani	0.20	0.10	0.21	0.10	0.09	0.13	0.10	0.01	0.08
Bangladeshi	0.18	-0.09	0.17	0.11	0.09	0.33	0.07	-0.18	-0.16
Other	0.16	-0.02	0.35	0.08	-0.01	0.19	0.08	-0.01	0.16
Unknown	0.30	0.16	0.20	0.22	0.07	0.13	0.08	0.09	0.07

Notes: Test score gain is measured as a standard normal variable with mean zero and standard deviation one.
SS = Specialist Schools initiative; EiC = Excellence in Cities programme; NT = non-treated.

TABLE 5 Estimated impact on test score gain of specialist schools and EiC status: by policy category

Explanatory variables	Dependent variable = test score gain between Key Stage 3 (age 14) and Key Stage 4 (age 16)		
	Policy category		
	SS = 1 EiC = 0	SS = 0 EiC = 1	SS = 1 EiC = 1
Ethnicity x policy category			
White x policy category	0.138***	-0.031	0.062*
	(0.016)	(0.023)	(0.033)
Black Caribbean x policy category	0.142**	0.125**	0.245***
	(0.066)	(0.051)	(0.066)
Other Black x policy category	0.112*	0.104**	0.238***
	(0.061)	(0.052)	(0.067)
Indian x policy category	0.142**	0.004	0.130*
	(0.062)	(0.058)	(0.073)
Pakistani x policy category	0.029	0.136**	0.181**
	(0.080)	(0.060)	(0.080)
Bangladeshi x policy category	0.168	0.188**	0.450***
	(0.159)	(0.077)	(0.141)
Other ethnic x policy category	0.114**	0.116**	0.320***
	(0.052)	(0.047)	(0.063)
Pupil and family characteristics			
Girl	0.226***	0.232***	0.232***
	(0.005)	(0.005)	(0.005)
Black Caribbean	0.003	-0.036	-0.040
	(0.033)	(0.032)	(0.032)
Black other	0.114***	0.063*	0.070**
	(0.034)	(0.033)	(0.034)
Indian	0.270***	0.179***	0.218***
	(0.036)	(0.036)	(0.037)
Pakistani	0.305***	0.145***	0.211***
	(0.050)	(0.046)	(0.048)
Bangladeshi	0.387***	0.246***	0.312***
	(0.052)	(0.050)	(0.051)
Other ethnic	0.105***	0.072***	0.086***
	(0.026)	(0.026)	(0.026)
Whether changed school after end of Key Stage 3	-0.190***	-0.137***	-0.159***
	(0.036)	(0.040)	(0.042)
Pupil eligible for free school meals	-0.364***	-0.291***	-0.318***
	(0.007)	(0.007)	(0.008)
English second language in home	0.205***	0.287***	0.227***
	(0.022)	(0.022)	(0.025)
Pupil has special needs,(statemented)	-0.480***	-0.416***	-0.440***
	(0.008)	(0.009)	(0.009)
Pupil has special needs (not statemented)	-0.250***	-0.166***	-0.193***
	(0.017)	(0.018)	(0.020)
Duration in same school as sat Key Stage 4 exam	0.063***	0.075***	0.077***
	(0.010)	(0.011)	(0.012)
Birth month (Sept = 1,… August=12)	0.000	0.000	0.000
	(0.000)	(0.001)	(0.001)
School characteristics			
Pupil /teacher ratio	-0.009*	-0.010*	-0.008
	(0.005)	(0.005)	(0.006)
Number of pupils in school	0.198	-0.180	-0.055
	(0.236)	(0.249)	(0.271)

TABLE 5 continued

Voluntary aided / vol. controlled / foundation school	0.039**	0.034**	0.057***
	(0.016)	(0.017)	(0.019)
Modern school	-0.199***	-0.203***	-0.229***
	(0.033)	(0.035)	(0.037)
Grammar school	0.237***	0.260***	0.293***
	(0.038)	(0.040)	(0.042)
Boys only school	0.086**	0.044	0.091**
	(0.041)	(0.035)	(0.045)
Girls only school	0.019	0.068*	0.026
	(0.035)	(0.036)	(0.040)
Proportion of pupils eligible for free school meals	-0.733***	-0.380***	-0.370***
	(0.140)	(0.106)	(0.135)
Proportion of pupils with English second language	-0.217***	-0.082	-0.116
	(0.084)	(0.074)	(0.089)
Proportion of special needs pupils (statemented)	-1.389**	-1.811***	-1.868***
	(0.559)	(0.550)	(0.606)
Proportion of special needs pupils (not statemented)	0.229*	-0.080	0.134
	(0.130)	(0.113)	(0.135)
Proportion of pupils white	-0.129***	-0.102**	-0.124**
	(0.042)	(0.047)	(0.050)
Constant	-0.022	-0.063	-0.128
	(0.115)	(0.119)	(0.136)
R^2	0.10	0.09	0.09
Number of observations	342664	303021	264586

Notes:
i. Dependent variable = value added between Key Stage 3 and Key Stage 4. SS = Specialist Schools initiative; EiC = Excellence in Cities Partnership; 0 = policy–off, 1 = policy-on.
ii. The control group for each equation is restricted to pupils in schools which did not have specialist status and were not in an EiC partnership during Key Stage 4.
iii. *, **, *** refer to significance at 10%, 5% and 1% respectively. The standard errors of the regression coefficients are adjusted for the clustering of pupils within schools.

TABLE 6 Estimated impact on test score gain of specialist schools and EiC status by policy category

(a) Boys

Explanatory variables	Dependent variable = test score gain during Key Stage 4		
	Policy category		
	SS = 1 EiC = 0	SS = 0 EiC = 1	SS = 1 EiC = 1
Ethnicity x policy category			
White x policy category	0.141***	-0.035	0.071**
	(0.017)	(0.024)	(0.035)
Black Caribbean x policy category	0.226***	0.205***	0.363***
	(0.088)	(0.063)	(0.086)
Other Black x policy category	0.184**	0.181***	0.342***
	(0.081)	(0.065)	(0.082)
Indian x policy category	0.171**	0.016	0.204**
	(0.073)	(0.064)	(0.086)
Pakistani x policy category	0.079	0.129*	0.231***
	(0.089)	(0.068)	(0.086)
Bangladeshi x policy category	0.185	0.095	0.387**
	(0.152)	(0.095)	(0.175)
Other ethnic x policy category	0.138**	0.110**	0.399***
	(0.062)	(0.056)	(0.072)
R^2	0.09	0.08	0.09
Number of observations	171902	152089	131921

Notes: See notes to Table 5. The estimated coefficients for the variables used as controls are the same as those in Table 5 and are not reported here.

(b) Girls

Explanatory variables	Dependent variable = test score gain during Key Stage 4		
	Policy category		
	SS = 1 EiC = 0	SS = 0 EiC = 1	SS = 1 EiC = 1
Ethnicity x policy category			
White x policy category	0.135***	-0.026	0.054
	(0.018)	(0.026)	(0.036)
Black Caribbean x policy category	0.060	0.047	0.136*
	(0.082)	(0.066)	(0.075)
Other Black x policy category	0.036	0.021	0.134*
	(0.075)	(0.063)	(0.079)
Indian x policy category	0.111*	-0.009	0.054
	(0.065)	(0.067)	(0.080)
Pakistani x policy category	-0.019	0.143**	0.137
	(0.087)	(0.067)	(0.093)
Bangladeshi x policy category	0.146	0.277***	0.494***
	(0.216)	(0.093)	(0.152)
Other ethnic x policy category	0.090	0.118**	0.252***
	(0.059)	(0.058)	(0.075)
R^2	0.07	0.07	0.07
Number of observations	170762	150932	132665

Notes: See notes to Table 5. The estimated coefficients for the variables used as controls are the same as those in Table 5 and are not reported here.

APPENDIX

Descriptive statistics for the 2003 cohort of pupils

Variables used in regression analysis	Boys			Girls		
	N	Mean	Standard deviation	N	Mean	Standard deviation
Pupil-level variables						
Test score gain during Key Stage 4 (decile-standardized)	239252	-0.131	1.007	239888	0.130	0.976
White	270371	0.864	0.342	263762	0.864	0.342
Black Caribbean	270371	0.013	0.112	263762	0.013	0.114
Black other	270371	0.016	0.124	263762	0.017	0.129
Indian	270371	0.024	0.154	263762	0.024	0.153
Pakistani	270371	0.023	0.151	263762	0.022	0.145
Bangladeshi	270371	0.009	0.092	263762	0.009	0.092
Other ethnic	270371	0.023	0.150	263762	0.025	0.155
Ethnicity not specified	270371	0.028	0.165	263762	0.027	0.163
Changed school during secondary schooling	270372	0.023	0.150	263762	0.025	0.155
Eligible for free school meals	269602	0.143	0.350	263523	0.146	0.353
English is second language at home	270037	0.077	0.266	263573	0.076	0.265
Pupil has special needs (statemented)	270372	0.048	0.213	263762	0.020	0.139
Pupil has special needs (not statemented)	270372	0.191	0.393	263762	0.117	0.321
Duration since joining school to end of Key Stage 4 (in yrs)	270372	4.409	0.801	263762	4.401	0.810
Month part of age at start of academic year (September = 1)	269986	5.366	3.475	263301	5.390	3.469
School-level variables						
Pupil /:teacher ratio in school	270372	17.402	2.051	263762	17.374	1.888
full time pupils/100 2003	264108	11.234	3.442	259714	11.287	3.394
Voluntary aided / controlled / or foundation school	264062	0.348	0.476	259658	0.341	0.474
Secondary modern school	264199	0.046	0.209	259780	0.045	0.208
Selective (grammar) school	264199	0.037	0.189	259780	0.039	0.194
Boys / girls only school	264199	0.090	0.286	259780	0.000	0.003
Proportion of pupils eligible for free school meals	264108	0.144	0.126	259714	0.144	0.126
Proportion of pupils with English second language	270354	0.075	0.165	263755	0.078	0.168
Proportion of special needs pupils (with statements)	264108	0.025	0.016	259714	0.023	0.016
Proportion of special needs pupils (not statemented)	264108	0.131	0.084	259714	0.127	0.082
Proportion of pupils white	263804	0.840	0.245	259410	0.836	0.247

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

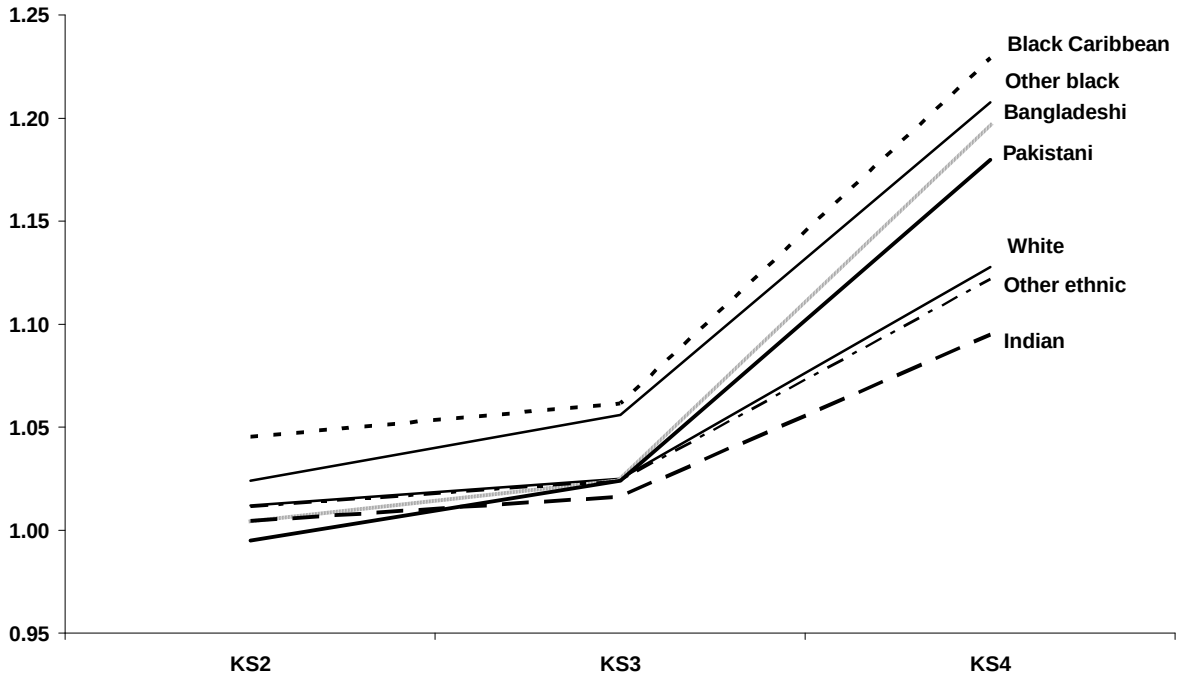

Figure 2 Index of test scores for boys

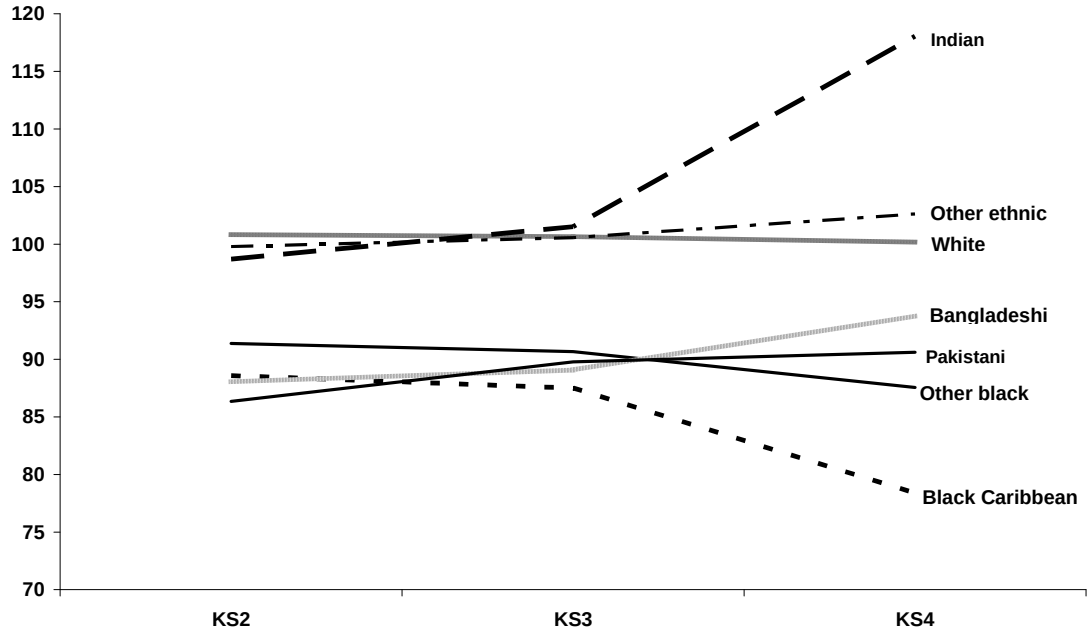

Figure 3 Index of test scores for girls