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Raising Education
Achievement and Breaking
the Cycle of Inequality
in the United Kingdom

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RAISING EDUCATION ACHIEVEMENT AND BREAKING THE CYCLE OF INEQUALITY IN THE UNITED KINGDOM

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by
Anne-Marie Brook

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ABSTRACT/RÉSUMÉ

Raising education achievement and breaking the cycle of inequality in the United Kingdom

Globalisation, together with skill-biased technical change, is changing the composition of jobs in advanced economies and raising the level of skills required to do them. This has increased the importance of educating a large proportion of the population to much higher standards than in the past. The government in the United Kingdom has responded to this challenge by raising education spending and expanding the capacity of the education system in key areas such as pre-primary education and increasing participation in education beyond the age of 16. Nevertheless, performance on international tests of cognitive ability remains significantly below the standards of the best performing OECD countries and the education system seems to be particularly poor at ensuring good performance of pupils in the middle to bottom half of the education performance distribution. A renewed sense of urgency, together with some new approaches, is required to address the United Kingdom's relative underperformance in literacy and numeracy. This paper proposes a number of avenues for encouraging a higher level of educational attainment, without significant further increases in expenditure.

This Working Paper relates to the 2007 Economic Survey of the United Kingdom
([www.oecd.org/eco/surveys/United Kingdom](http://www.oecd.org/eco/surveys/United%20Kingdom))

JEL classification: H52; H75; I20; I22; I28

Key words: education; United Kingdom; England; equality; targets; funding.

Élever le niveau de formation et rompre le cycle de l'inégalité au Royaume-Uni

La mondialisation, conjuguée à l'évolution technologique qui privilégie la main-d'œuvre qualifiée, modifie la composition des emplois dans les économies avancées et entraîne un relèvement du niveau des qualifications requises pour les occuper. Aussi est-il aujourd'hui plus important d'amener une grande proportion de la population à un niveau de formation infiniment plus élevé que dans le passé. Pour relever ce défi, les pouvoirs publics au Royaume-Uni ont augmenté les dépenses d'éducation, renforcé les moyens dont dispose le système éducatif dans des secteurs clés tels que l'éducation pré-primaire, et prolongé la scolarisation au-delà de l'âge de 16 ans. Malgré cela, les résultats de ce pays aux tests internationaux d'aptitudes intellectuelles restent sensiblement inférieurs au niveau atteint par les pays de l'OCDE les plus performants et le système éducatif britannique semble avoir beaucoup de mal à faire en sorte que les élèves situés dans la moitié inférieure de la distribution des performances en éducation obtiennent de bons résultats. Une conscience redoublée de l'urgence et quelques nouvelles approches s'imposent pour remédier aux sous-performances relatives du Royaume-Uni dans la maîtrise de l'écrit et des chiffres. Cet ouvrage propose un certain nombre de pistes pour favoriser un relèvement du niveau d'instruction sans pour autant accroître encore notablement les dépenses.

Ce document de travail porte sur l'Étude économique du Royaume-Uni
([www.oecd.org/eco/surveys/United Kingdom](http://www.oecd.org/eco/surveys/United%20Kingdom))

Classification : JEL : H52; H75; I20; I22; I28

Mots clés : éducation; Royaume-Uni; Angleterre; égalité; cibles; financement.

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TABLE OF CONTENTS

Raising education achievement and breaking the cycle of inequality in the United Kingdom	5
Introduction: Education as a tool for addressing the challenges of globalisation	5
Challenges facing the education system in England	7
Policies to improve education attainment and help to break the cycle of inequality	14
Summary and Recommendations	28
Bibliography	30

Boxes

1. Raising education participation: coercion or compulsion?	8
2. Sophisticated benchmarking to assess school performance	14
3. Lessons from Finland: the role of societal values	20
4. Funding formulas versus flexibility: the allocation of education spending in England	25

Figures

1. Employment share by job quality decile	5
2. Educational attainment by age group	6
3. United Kingdom students' performance on PISA 2006	9
4. Intergenerational earnings elasticity – estimates from various studies	10
5. The best performing countries have the most homogenous outcomes	12
6. Attainment gaps across schools by deprivation level	18
7. Measures of education productivity	21
8. Higher spending does not automatically translate into higher attainment	22
9. Real expenditure growth has increased across all levels of education	23

Raising education achievement and breaking the cycle of inequality in the United Kingdom

By Anne-Marie Brook¹

Introduction: Education as a tool for addressing the challenges of globalisation

The last OECD Economic Survey of the United Kingdom had a particular focus on the economic benefits and challenges posed by globalisation (OECD, 2007a). In that context, significant importance is placed on education as a tool for strengthening the earnings capacity of the population and for ensuring that all children are equipped with the skills they need to succeed in an increasingly globalised economy. This paper provides an update of that analysis, focusing on how the compulsory education system is addressing two key problems: first, the fact that the skill level of the workforce (including the younger cohorts) is relatively low; and second, the fact that the education system still seems to perpetuate rather than break the cycle of inequality. In light of the increasingly binding fiscal constraints of the government, the focus is on ways in which higher primary and secondary education performance can be achieved without significant further increases in spending. Although globalisation may also imply significant benefits from up-skilling the adult population, continuing education, vocational training, and tertiary education are not covered in this paper, although some of these issues are touched on in OECD (2007a).

As in other advanced economies, there is some evidence to suggest that many moderately skilled jobs in the United Kingdom are being “hollowed out” by offshoring and computerisation (Figure 1).

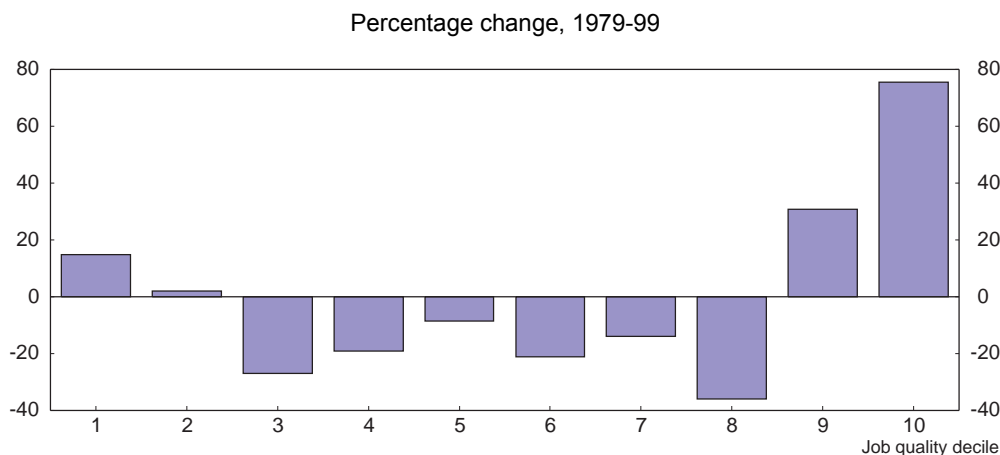
Most of the job types that are being hollowed out can be described as routine, involving tasks that rely on very little tacit knowledge and which can be relatively easily specified in rules (*e.g.* call centre work, assembly line work, or the processing of basic tax returns). Some more highly skilled jobs – those that involve a heavy component of rules and standardised procedures – have also moved offshore (*e.g.* technical jobs in programming, engineering, financial analysis etc).² But there has been strong employment growth in the most skilled and highly paid professions – those that require more abstract cognitive skills involving complex communication with other humans (*e.g.* lawyers, managers) or solving problems and exercising good judgement in the face of uncertainty (*e.g.* scientists, doctors). At the same time, manual low-skilled jobs, most often in service occupations, are unlikely to disappear, even if their numbers are not increasing rapidly.

1. The author is a senior economist working in the Economics Department of the OECD. The paper is based largely on work originally prepared for the *Economic Survey of the United Kingdom* published in September 2007 under the authority of the Economic and Development Review Committee (EDRC). The author would like to thank Peter Hoeller, Andrew Dean and colleagues in the Education Directorate of the OECD for comments on earlier drafts, but retains full responsibility for any errors or omissions. Thanks also to Desney Erb for excellent technical assistance and to Celia Rutkoski and Sylvie Ricordeau for technical preparation.

2. Autor *et al.* (2003); Levy and Murnane (2006).

Importantly, the increasing demand for higher-level skills comes not only from changes in the employment share between occupations, but also because of changing skill demands from within occupations. For example, a bank teller today spends more time than in the past selling financial services, and less time performing routine tasks such as processing deposits and withdrawals. Similarly a mechanic can no longer function without the ability to read and to work with computerised testing equipment.

Figure 1. Employment share by job quality decile¹



1. Employment data are taken from the Labour Force Survey and the quality deciles are based on median wages in 1979 from the New Earnings Survey. Both use three-digit SOC90 codes.

Source: Goos, M. and A. Manning (2007), "Lousy and Lovely Jobs: The Rising Polarization of Work in Britain", *The Review of Economics and Statistics*, Vol. 89, No. 1, The MIT Press.

Recognition of these trends by both the public and policymakers explains why there is now much greater pressure on the education system to equip more pupils with more advanced skills. The Leitch Review of Skills (Leitch, 2006) also concluded that the skills base of the UK economy is too weak, although the focus of that report was predominantly on qualifications. While it is beyond the scope of this *Survey* to discuss how more advanced cognitive skills can be taught, common sense would suggest that they would require a strong foundation of basic reading, writing and mathematics. In this context the government's announcement in December 2005 of a renewed emphasis on "basic skills" was very welcome.³

Globalisation and an increased focus on education achievement go hand in hand. This is partly because globalisation raises the return to higher education and worsens the labour market outcomes of some of the lesser skilled; to maintain broad support for globalisation, it is therefore important to ensure that the whole population is able to share in the gains. At the same time, with policy increasingly emphasising the goals of "making work pay" and of facilitating people's integration into the labour market (OECD, 2007a), the impact of education policy on the labour market outcomes of the disadvantaged is increasingly important, and the use of education as a tool to remedy social disadvantages is justifiable for

3. DfES (2005). The previous benchmark indicator for school performance was the percentage of pupils at the end of year 11 (normally aged 16) achieving 5 or more A*-C GCSEs (and equivalent). This indicator has now been modified to include a requirement that the core subjects of English and mathematics are included in the qualifying GCSEs (see Box 2.2 for further discussion). In addition, a general (GCSE) diploma will be introduced to recognise those who achieve this standard.

both efficiency⁴ and social justice reasons. However, while education can break intergenerational cycles of disadvantage, it can also act to reinforce them: for example, if education policy is not designed with egalitarian notions in mind (Machin, 2006).

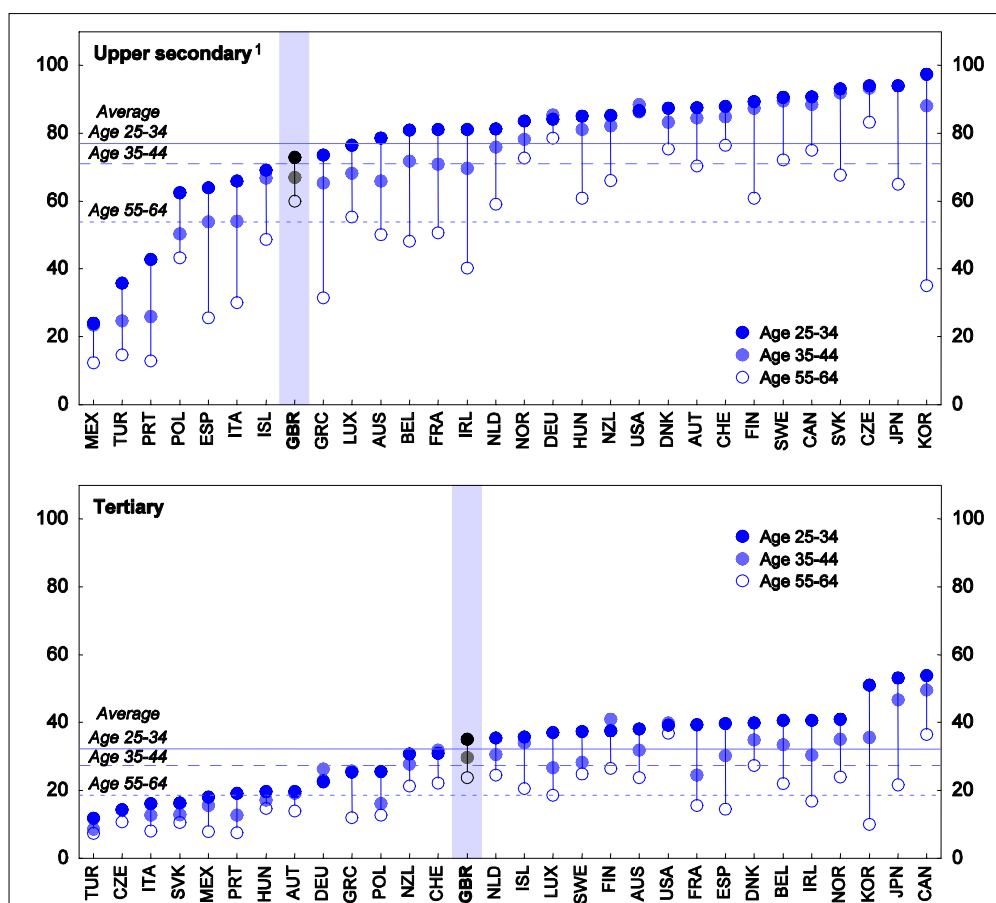
Challenges facing the education system in England

Secondary school completion is relatively low

The educational performance of the UK population is below the standard of the best performing OECD countries. This is reflected in the United Kingdom's relatively low secondary school completion rates (Figure 2) and in results that are only average on internationally comparable assessments of cognitive skills (e.g. PISA, see discussion below).

Figure 2. Educational attainment by age group

In per cent of population in each age group, 2005



1. Excluding ISCED 3C short programmes except for Austria and the United Kingdom where some are included. 2003 data for Japan.

Source: OECD (2007), *Education at a Glance*, OECD Publishing.

4. Countries such as the United Kingdom where the relationship between socio-economic background and student performance is strong do not fully capitalise on the skill potential of students from disadvantaged backgrounds, suggesting inefficiency because of wasted talent.

In recognition of the relatively low school completion rates, the government has made significant efforts to raise education participation among 16 and 17-year-olds. One successful intervention has been the Education Maintenance Allowance (EMA) which uses the payment of a small allowance to encourage 16-19-year-olds from poor families to continue in education. More controversially, the government is also in the process of raising the minimum age for discontinuing participation from 16 to 18.⁵ In part, this change reflects a desire to rank among the best performing countries in the OECD in terms of education participation,⁶ and it is also supported by evidence that higher levels of education can improve health and lower the probability of being imprisoned or becoming a future welfare recipient.⁷ At the same time, however, there may be better ways than compulsion of achieving this goal (Box 1). For example, it may be better to introduce compulsion only for those pupils who have not already achieved a certain minimum standard of core skills (English and mathematics) by age 16. This would ensure continued focus (by schools and young people) on the acquisition of core skills, both prior to and after age 16, and ensure that the education system prior to age 16 focuses attention on the needs of the lowest performers. Alternatively, compulsion could be delayed until it has been shown that there are significant positive returns to the new diplomas.

Box 1. Raising education participation: coercion or compulsion?

After fluctuating in the 64-66% range over 1994-2003, the percentage of 16 and 17-year-olds in full-time education increased to 69% in 2005 and provisional data suggests that it rose further to 72% in 2006. Government efforts to bring about increased participation have included the guarantee of a place in an educational institution after age 16 (the September Guarantee launched in 2007) and the education maintenance allowance (EMA), introduced in September 2004, which pays up to £30 per week to 16-19-year-olds from families with an income of less than £30 810 per annum who stay on at school or undertake unpaid training. EMA payments are stopped for absenteeism and there are bonus payments to reward achievement of agreed learning goals. Including work-based learning and other forms of training, 16 and 17-year-old participation rates have regained previous levels of around 86% after falling back in the late 1990s and early 2000s (OECD calculations based on DfES, 2007a). All evaluations of the EMA have found positive effects on participation and retention in education, and the most recent research also suggests positive effects on achievement (Chowdry *et al.*, 2008 and Aitken *et al.*, 2007). Moreover, the evidence suggests that the policy is to a large extent displacing individuals from unproductive activities, and it is cost effective, despite its significant expense (Dearden *et al.*, 2006).

For 17 year-olds, the participation rate (in education and work-based learning) was 78% in 2006 and the government has set an aspiration to raise this to 90% by 2015. The government is currently overhauling vocational education by introducing new diplomas in 17 broad areas, each available in at three levels from foundation to advanced (DCSF, 2007). If successful, these diplomas may eventually replace many of the existing 3 500 separate qualifications, thus simplifying the existing system. Some of the new diplomas will be available from 2008 and all will be available from 2013. Although it is too early to judge what the economic returns of these diplomas will be, their goal is to offer a mix of practical and theoretical study for those young people who prefer a more applied approach than offered by the existing qualifications. The government is expecting that a naturally increasing trend in the participation rate will be boosted when the new diplomas are implemented.

Although the government expects to meet its aspiration of 90% participation (in education or work-based training) by 17 year-olds by 2015, it is also in the process of introducing more compulsion by making participation in some form of education or training mandatory until age 18 (DfES, 2007b). The policy will be introduced in phases, initially requiring youth to participate until they turn 17 from 2013, and then until they turn 18 from 2015. Since the majority of young people would be choosing to participate in education or training voluntarily by 2015, it is expected that

5. The Education and Skills Bill requires young people to participate in education or training until they are 18 or until an A-level or equivalent qualification is obtained, whichever is earlier. However, there is a part-time participation option for young people with jobs and the current proposal would not require such young people to return to full-time education or training if they leave their job (OECD, 2008).
6. The government's consultation green paper states: "We already have a challenging aspiration to get to 90% participation in education or training among 17-year-olds by 2015, and we are confident of reaching this. However, even 90% participation will not put us among the best performing countries in the OECD" (DfES, 2007b).
7. Lockner and Moretti (2004); Feinstein (2002) and Coelli *et al.* (2007).

compulsion will be binding for only around 10% of the cohort. Sanctions (in the form of an Attendance Order and ultimately a fine), would be introduced for hard core cases who refuse to participate, although the government is trying to develop a process that avoids criminalisation. Young people would have the option of studying either for a general qualification (GCSEs, A-levels, International Baccalaureates), as part of an Apprenticeship, or for one of the new diplomas. The government has recently consulted on whether working towards an accredited occupational qualification would be sufficient, or whether young people should also be expected to develop core literacy and numeracy skills.

The government has argued that compulsion will mean that the education system will need to focus more on the needs of young people who are least likely at present to choose to participate; provide better for them pre-16; and make sure that there are high quality options post-16 which can engage and interest them. Indeed, these are good goals. However, it is not clear that compulsion is the best way to achieve them. In the United States there is substantial evidence that higher student achievement leads students to stay in school longer voluntarily (see Hanushek and Woessmann [2007] for a review). For those students who have already performed poorly, and who are unmotivated, it is not clear what the returns to further education and training at ages 16 and 17 would be, particularly since the return on many existing vocational qualifications is low and the new diplomas are yet to be tested.¹ Indeed, by compelling unwilling young people to remain at school, they may disrupt the learning of others.

Two other factors should also be kept in mind. First, education participation is a relatively poor proxy for skills, and a focus on qualifications can hide problems of poor usage and over-qualification. Educational quality – measured by cognitive skills – is a much better measure of human capital than years of schooling (Hanushek and Woessman, 2007), and care should be taken to ensure that greater quantity is not sought at the expense of quality. To maintain flexibility, and provide the right incentives, a better policy may be to introduce compulsion only for those students who have not already achieved a minimum level of core skills by age 16. Second, recent OECD research on equity in 10 countries found that the lower the age that academic selection into different “tracks” begins, the worse the PISA performance. As a result the benefits of a unified stream of education were emphasised and it was recommended that countries “limit early tracking and streaming and postpone academic selection” (Field *et al.*, 2007). Unless accompanied by a strong focus on core literacy and numeracy skills, the move to the new Diplomas within the government’s strategy for 14-19 year-olds could be seen as counter to this advice. More generally, the new Diplomas should be seen as a first step towards the full implementation, in the longer term, of the proposals put forward in the Tomlinson report (DfES, 2004).

1. See Box 8.1 in OECD (2005a) for a literature review.

Adult literacy is relatively poor

The United Kingdom’s relatively poor level of cognitive skills is reflected in the results of internationally comparable assessments. For example, the International Adult Literacy Survey (IALS), which assessed the proficiency of adult literacy in 20 countries between 1994 and 1998, found that the United Kingdom ranked in the bottom half of the 20 participating countries, and that roughly half the working age population had literacy and numeracy skills at one of the two lowest levels, compared with just a quarter of the population in Sweden, the top performer (OECD, 2000). The IALS judged that the low level of literacy proficiency of these people would make it difficult for them to face novel demands, such as learning new job skills, even if they have developed coping skills to manage everyday literacy demands.⁸ The United Kingdom did not participate in the update of this survey (known as the Adult Literacy and Life Skills Survey). However, the government has been participating actively in development work for the next adult skills survey (the Programme for International Assessment of Adult Competences –

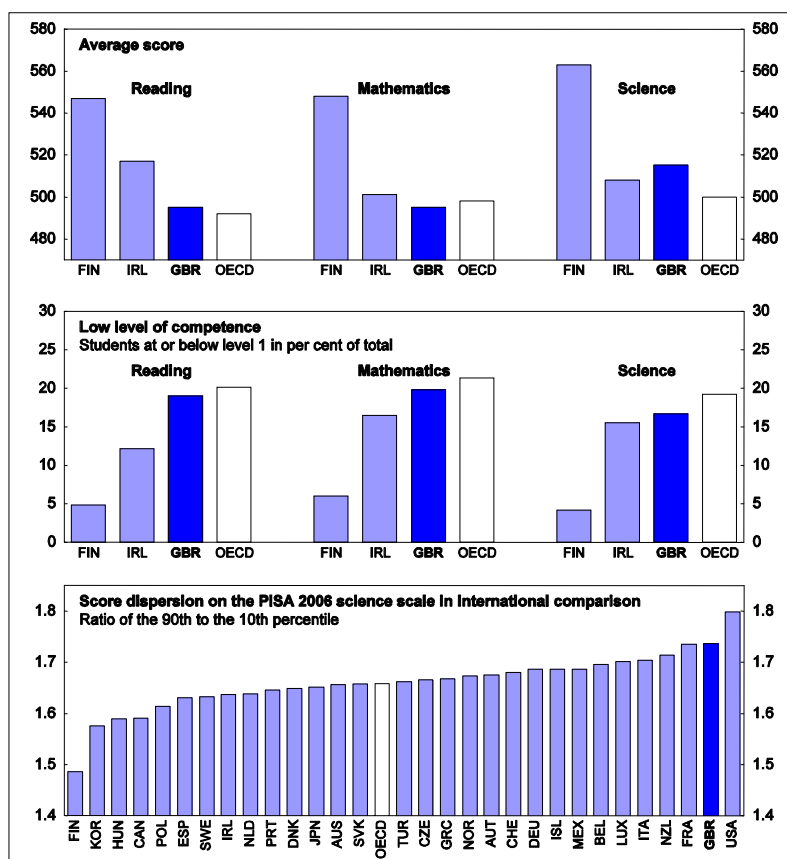
8. The IALS survey was taken by a sample of the population aged 16–65 (in the United Kingdom the sampling took place in 1996). In the United Kingdom, 23% of people were found to be performing at the lowest level of literacy (level 1), compared with just 7% in Sweden, the top performer. These people have very poor skills (*e.g.* they may be unable to determine the correct amount of medicine to give a child from information printed on the package). Some 28% of the population in the United Kingdom (19% in Sweden) were classified at the second lowest level of literacy (level 2). At this level respondents can only deal with material that is simple, clearly laid out, and in which the tasks involved are not too complex. Level 3 (31% in the United Kingdom; 39% in Sweden) is considered a suitable minimum for coping with the demands of everyday life and work in a complex advanced society. Levels 4 and 5 (18% in the United Kingdom; 35% in Sweden) describe respondents who demonstrate command of higher-order processing skills.

PIAAC). The likely testing window for PIAAC is 2011, which should allow a sufficient time lapse to document any recent improvement in adult cognitive skills resulting from programmes such as the *Skills for Life* initiative.

PISA results fall behind those of the best performers

There is also a need for higher education performance in the compulsory school system if the United Kingdom is to reach the standards of the highest performing countries. The results from the 2006 PISA (Programme for International Student Assessment) study show that 15-year-olds in the United Kingdom perform close to the OECD average in reading and mathematics and do better than the average in science (Figure 3, top panel). According to this study, the United Kingdom is far behind the best performing countries in the OECD under all three areas of knowledge, with almost 20% of students performing at the lowest level of competence versus only around 5% in Finland, the top performer (middle panel). When compared with the PISA results from previous years, there may have been some deterioration over time.⁹ Dispersion in performance is also more marked than in all other OECD countries except the United States (bottom panel).

Figure 3. United Kingdom students' performance on PISA 2006¹



1. The OECD aggregate is an unweighted average.

Source: OECD (2007), *PISA 2006: Science Competencies for Tomorrow's World*, OECD Publishing.

9. Average scores in the 2006 PISA were below those in the 2000 and 2003 studies. However, because of a low response rate in the previous years (see Micklewright & Schnepf [2006] for details), the 2000 and 2003 results are generally excluded from international and across-time comparisons. Thus, it is only possible to say with confidence that the UK's sample results in the 2006 study reliably reflect those for the national population with the level of accuracy required by the PISA study.

Further analysis shows that the United Kingdom's performance is not so bad among its top students. Table 1 – which compares the distribution of the United Kingdom's PISA scores with those in the top 7 countries – shows that UK pupils at the very top of the performance distribution do relatively well (a gap relative to the top 7 countries of 15-18 points at the 95th and 90th percentiles), whereas the gap is wider further down the distribution (peaking at 35 points at the 10th percentile). These results illustrate that the UK education system is least successful at ensuring good performance of pupils in the middle to bottom half of the education performance distribution. Higher average performance overall would therefore seem to require a levelling up of student outcomes in the middle and bottom half of the distribution.

Table 1. Average PISA scores by percentile ranking: top seven performers versus the United Kingdom¹

	5th	10th	25th	Mean	75th	90th	95th
Average PISA score top 7 countries	370	407	468	530	595	646	675
United Kingdom	335	372	435	502	571	628	660
Gap: Top 7 – United Kingdom	34	35	32	28	24	18	15

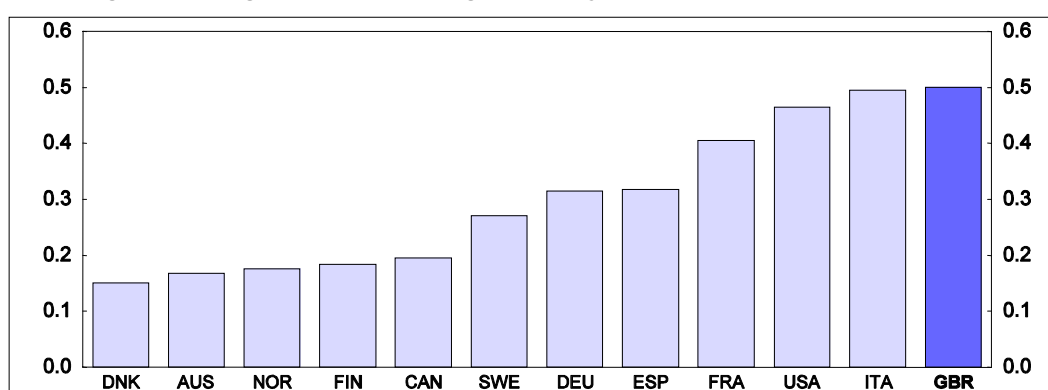
1. Measured by the unweighted average of the various percentile scores for mathematics, reading and science. The top seven performers are Finland, Korea, Canada, New Zealand, Netherlands, Australia and Japan.

Source: OECD (2007), *PISA 2006: Science Competencies for Tomorrow's World*.

Intergenerational social mobility is low

In all countries there is a strong correlation between educational achievement and socio-economic background. In the United Kingdom, however, research suggests that intergenerational social mobility is lower than in many other OECD countries. This shows up in relatively low occupational and education mobility (d'Addio, 2007) as well as low intergenerational income mobility. A common measure of intergenerational income mobility is the fraction of relative income differences between fathers that are transmitted to their sons: the higher this elasticity, the lower is intergenerational income mobility. While this elasticity measure suggests relatively high social mobility in the Nordic countries, Australia and Canada, it suggests the least mobility for the United Kingdom (Figure 4).

Figure 4. Intergenerational earnings elasticity – estimates from various studies¹



1. The higher the parameter, the higher is the persistence of earnings across generations and thus the lower is mobility.

Source: D'Addio, A.C. (2007), "Intergenerational Transmission of Disadvantage", *OECD Social, Employment and Migration Working Papers*, No. 52.

Other studies confirm that intergenerational income mobility in the United Kingdom is both low and declining.¹⁰ One explanation is that the expansion of opportunities for university study in the 1980s and 1990s favoured those from better-off backgrounds, thus reinforcing income persistence across generations and depressing the prospects for social mobility.¹¹ Even today, students from low socio-economic backgrounds are much less likely to have the grades (including English and mathematics) required to enter the academic A-level track at high school which is the main conduit to university study (as discussed further below).

National data on education performance is consistent with this. A comprehensive evaluation of achievement gaps between pupils and schools with differing levels of deprivation up to the year 2005 (DfES, 2006) found that while average performance has improved across the board, the extent of narrowing of achievement gaps depended on the measures used and whether the comparison was across schools or across pupils. The cross-school comparison showed a clear narrowing in the achievement gap between the *least* and *most* deprived schools when using the benchmark measure of the percentage of pupils achieving five or more A*-C GCSEs or equivalents.¹² However, schools a step above the bottom showed much less improvement. In addition, when the alternative measure of five or more A*-C GCSEs *including English and mathematics* was used, there was much less evidence of narrowing. Updated data for 2007 show that this conclusion continues to hold (Figure 6). Finally, it is not clear whether the gaps have narrowed at all when they are measured across deprived and non-deprived pupils, rather than across schools. For example, Table 2 shows that the gap between the percentage of FSM (free school meals) and non-FSM students attaining the five or more A*-C GCSE benchmark narrowed by over 3 percentage points between 2002 and 2007. However, the gap has not closed at all when measured using the benchmark including English and mathematics.

Table 2. Proportion of pupils attaining GCSE benchmarks

Percentage of pupils in England attaining five or more GCSEs or equivalent

	Grades A* to C			Grades A* to C including English and mathematics		
	2002	2007	Difference	2002	2007	Difference
Free school meals	23.0	35.5	12.5	14.7	21.1	6.4
Non-free school meals	53.7	62.8	9.1	42.6	49.0	6.4
Gap	30.7	27.3	-3.4	27.9	27.9	0.0

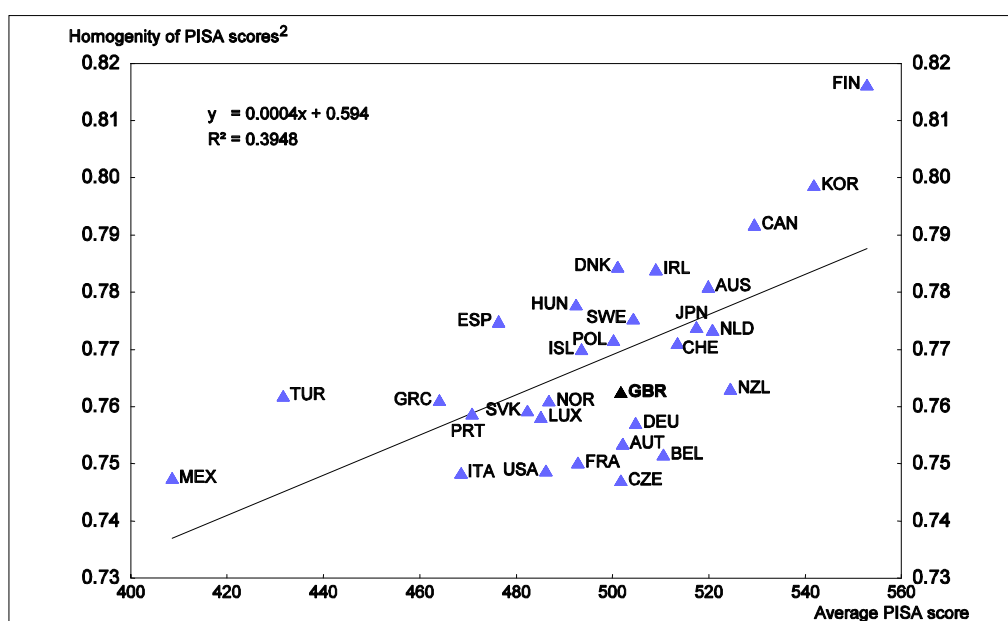
Source: DCSF (2007), "National Curriculum Assessment, GCSE and Equivalent Attainment and Post-16 Attainment by Pupil Characteristics, in England 2006/07", *Statistical First Release*, Department for Children, Schools and Families, November, www.dcsf.gov.uk/rsgateway/DB/SFR.

10. Blanden *et al.* (2004) showed that intergenerational earnings mobility had fallen over time in Britain when comparing individuals born in 1958 and 1970. Earlier studies also found that intergenerational mobility was low (e.g. Solon, 2002).
11. Between 1981 and the late 1990s, young people from the poorest 20% of families increased their university graduation rate by just 3 percentage points, compared with a rise in graduation rates of 26 percentage points for those born to the richest 20% of parents (Blanden and Machin, 2004).
12. The GCSE is the General Certificate of Secondary Education. Two measures of the change in the gap were used: *i*) the absolute change in the gap in achievement and *ii*) the *odds ratio*, which is defined as the probability of one group of schools attaining the benchmark, divided by the probability of the other group. Both measures showed a clear narrowing of the gap between the percentage of pupils achieving five or more A*-C GCSEs and equivalents in the least deprived versus most deprived schools. The least deprived schools were those with $\leq 5\%$ of pupils eligible for free school meals (FSMs) while the most deprived schools were those with $>50\%$ of pupils eligible for FSMs. See DfES (2006) for further details.

Some people worry that devoting more resources to raising educational achievement of the poorest performers would drag down aggregate performance. Fortunately, however, cross country analysis suggests that there is no trade-off between high average achievement and equality of educational opportunity. For example, Figure 5 shows that the top PISA performers are also countries that achieve a relatively high degree of homogeneity across the distribution of student outcomes.¹³ For the United Kingdom, this suggests that higher overall performance in PISA is likely to require policies that ensure that more children from lower socio-economic backgrounds receive an education that adequately prepares them for higher education. At the same time, such policies will also ensure that the gains from globalisation are spread more evenly.

Figure 5. The best performing countries have the most homogenous outcomes

2006¹



1. 2003 data for reading for the United States.

2. Measured by the ratio of the average score of the 25th percentile to that of the 75th percentile (the higher the ratio, the greater the homogeneity in student performance).

Source: OECD (2007), *PISA 2006: Science Competencies for Tomorrow's World*, OECD Publishing.

Primary school reading performance is showing no sign of improvement

One of the problems with assessing education policies is that there are long lags between the introduction of new policies in schools and the outcome in the form of (hopefully) improved educational performance. For this reason, it is useful to look at the performance of younger pupils on international tests of cognitive ability, as well as the performance of 15-year-olds on PISA. Unfortunately, however, the most recent results from international measures of reading literacy among children aged about 10 do not paint a picture that is any more positive than that painted by PISA. The PIRLS International 2006 survey of achievement in reading showed that England's performance had deteriorated relative to its performance in

13. Very similar results are obtained using alternative measures of homogeneity, such as the 10th/90th or 5th/95th percentile ratios.

2001.¹⁴ Moreover, data on the distribution of the PIRLS results suggest that children in the middle and bottom half of the distribution are already falling behind those in the top performing countries even before they complete primary school. Consistent with the PISA results (shown in Table 1), Table 3 shows that reading performance among the most advanced English children was not much below that of the most advanced children in the top 7 countries (a gap of only 2 percentage points). Some positive reflection of policies to assist the poorest performers is evident in the fact that the biggest gap was not among the lowest performers. However, a much wider gap is evident among children in the middle and lower part of the distribution.

Table 3. Percentages of students reaching the PIRLS 2006 International Benchmarks of Reading Achievement: Top seven performers versus the United Kingdom

	International Benchmark			
	Advanced	High	Intermediate	Low
Average percentage reaching benchmark in top 7 countries ¹	17	57	88	98
Percentage reaching benchmark in England	15	48	78	93
Gap: Top 7 – United Kingdom	2	9	10	5

1. Measured by the unweighted average of the percentage of pupils reaching each international benchmark. The top seven performers were Singapore; the Russian Federation; Canada, Alberta; Bulgaria; Canada, British Columbia; Canada, Ontario; Luxembourg and Hong Kong SAR.

Source: International Association for the Evaluation of Educational Achievement (2007) *PIRLS 2006 International Report*.

Policies to improve education attainment and help to break the cycle of inequality

The UK educational authorities have aimed to improve student achievement through a number of channels, and in some areas the education system is already considered to have commendable institutional features – such as significant school autonomy (Gonand, 2007). The United Kingdom has also pioneered the widespread use of benchmarking of schools. New value added measures of performance are now published for all schools alongside Office for Standards in Education (Ofsted) reports and raw measures of performance. These permit school performance evaluation to take into account the relative advantage or disadvantage posed by their pupil intake (Box 2). Nevertheless, public interest continues to focus on absolute school rankings in the league tables which do not adjust for these factors.

Box 2. Sophisticated benchmarking to assess school performance

Each year, Achievement and Attainment Tables are published for each primary and secondary school, indicating the achievement of pupils at different levels. Over time, the indicators published have changed, mostly in positive ways. For example, in December 2005, the “gold standard” indicator for 15-year-old pupils was modified to include a requirement that the core subjects of English and mathematics were included in the qualifying GCSEs. This indicator is now: *the percentage of pupils at the end of year 11 (normally aged 15 or 16) achieving five or more A*-C GCSEs (and equivalent) including English and mathematics GCSEs.*

Since a longer time series is available for the previous indicator (which was the same, but without specifying the English and mathematics requirement), this will continue to be published until 2008. Part of the reason for the importance of the new benchmark (including English and mathematics) is that it represents the standard that is

14. In the 2001 study England ranked 3rd and Scotland 14th out of a total sample of 35 participants. In the 2006 study England ranked 19th and Scotland 26th out of a total sample of 45 participants. Similarly, in the 2003 TIMSS study of mathematics skills among 9-10 year-olds, England ranked tenth and Scotland 18th out of a total sample of 25 participants. The 2007 TIMSS results will be available later in 2008. Note that in both the PIRLS and the TIMSS studies the participant samples included developing as well as more advanced countries.

required for 15 and 16-year-olds to enter the most academic and most prestigious (A-level) track in upper secondary school. Other indicators, reflecting the achievements of pupils who achieve a lower standard are also published.

The “high performing schools” identified by the above indicators are typically those with the best-prepared students going into them, but not necessarily those where the *value-added* of the school is high, and *vice versa* for bad schools. To address this concern the government has developed more sophisticated techniques for assessing pupils and schools. For example, value added measures have been published in School Achievement and Attainment Tables since 2002. They measure the achievement of pupils in comparison to pupils with similar prior achievement; this is fairer than using raw outcomes since schools can have very different levels of achievement on entry.

More recently, an enhanced indicator, known as Contextual Value Added (CVA) has been developed and published for the first time in the 2006 tables. This aims to take into account other factors that are related to the progress that pupils make in a school, but which are outside a school’s control. Factors that have been taken into account in the CVA models include: pupil prior achievement; gender; special educational needs; first language; ethnicity; measures of deprivation; measures of pupil mobility; age; an “in care” indicator; and the average and range of prior achievement within the school. CVA measures have thus replaced the value added measures which were based on prior attainment only. No CVA measures are published for private schools since these schools do not provide the required detailed information about individual pupils. These measures offer significant potential for more closely evaluating the performance of under-performing schools that currently achieve above the bottom threshold “floor target”, and for distinguishing high quality from low quality teachers (not currently done).

Source: Largely based on DfES (2006c), “Publication of 2006 Test and Examination Results in the School and College Achievement and Attainment Tables”, June, www.dfes.gov.uk/performance/tables.

One channel through which the educational authorities have aimed to improve student achievement is by raising education spending as a percentage of GDP, while making efforts to direct the additional spending to areas with the highest pay-off. Another channel has involved emphasising performance incentives for local authorities, schools and teachers. These policies include: an expanded choice of schools for pupils; the setting of targets and the widespread use of benchmarking to evaluate state-funded schools and identify the best and worst performers; the introduction of merit pay for teachers.

Despite these efforts, the indicators discussed in section 2 of this paper suggest that while there have been improvements in some areas (such as secondary school completion rates), the extent of improvements in cognitive achievement tests have been less than would have been hoped. What is going wrong? Section 2 presented evidence that the United Kingdom performs rather badly at the middle and the bottom of the competency scale – *i.e.* among the mid-ranking and worst students – while it ranks much closer to the best-performing countries in the OECD when the best students are compared. This suggests that additional efforts are required to raise the performance of these middle- and bottom-ranking students in terms of their core cognitive (literacy and mathematical) skills. If this can be achieved – particularly at a relatively early age – then many of the subsequent challenges facing the education system (such as what to do with a poorly-performing and unmotivated 16-year-old) would be lessened. Possible avenues for moving in this direction include:

- Additional resources directed to early childhood education.
- A possible different approach to monitoring school performance and raising the standards of the underperformers – involving less emphasis on testing and targets and more focus on supporting weak students and schools.
- Improved incentives for good teachers to go to poor schools.
- Better allocation of spending to address inequities.

The remainder of this paper discusses each of these in turn.

Direct additional resources to early childhood education

A number of studies have shown that high-quality early childhood education and care (ECEC) programmes have positive effects on participants' school achievement and improve parenting skills, particularly for children from immigrant or disadvantaged backgrounds.¹⁵ However, the United Kingdom is lagging behind many other OECD countries in terms of the public provision of such services (*e.g.* see OECD (2008) for further discussion). At present, the United Kingdom plans to increase the ECEC entitlement to 20 hours per week for children aged 3 and 4 by 2010; however, this will continue to fall short of the standards of provision in many comparator countries.

A promising initiative is the Sure Start Children's Centres (SSCCs) which were launched in England in 2006 for children aged 0–3, building on earlier experience with Sure Start Local Programmes (SSLPs) opened in 1999. As summarised in OECD (2008), the SSCCs have a duty to improve the life chances of all children, but are required, in particular, to reduce inequalities between the poorest children and the rest. While an earlier study had showed disappointing results about the effectiveness of SSLPs – in the sense that the most positive effects were only evident for relatively less disadvantaged children – a more recent evaluation revealed a variety of beneficial effects for a broader group of 3-year-old children, including those from the most disadvantaged backgrounds (NESS, 2008). While it is not possible to exclude that methodological differences explain the diverging findings, it is also plausible to assume that the children participating in the second phase were exposed to better developed programmes (OECD, 2008). These results suggest that the successful programmes should be further expanded, so as to increase participation – with children from disadvantaged backgrounds being specifically targeted for inclusion. Sustained intervention once disadvantaged children have entered primary school will also be required, to ensure that the benefits of pre-school interventions are sustained and to limit relative under-performance in school later in life. If it can be ensured that young people have developed the key cognitive and non-cognitive skills that are needed in the workforce by age 16, then a higher compulsory school age may not be required (see earlier discussion).

Reduce focus on testing and targets and put more focus on supporting weak students and schools

Experience to date with “school choice” and with the use of targets is mixed. While expanded school choice by students and parents can be a powerful tool, by providing pupils with the opportunity to move to a better performing school and by creating competition between schools, choice tends only to work for a well informed and confident clientele and when the supply side is secure and flexible enough to be able to adapt properly. In the United Kingdom, it is not clear that pupils and parents in the lowest socio-economic classes are able to take advantage of school choice. A study of pupil mobility by Machin *et al.* (2006) found that pupils that change schools tend (on average) to move to better schools. However, they also found that children from lower socio-economic backgrounds are much less likely to make the move to a better school than are children from wealthier backgrounds. In part, this may reflect the complication of the admissions system and the government has helped to address this by introducing a network of advisers who will provide additional assistance to families who are most likely to struggle with the admissions process. But it also reflects the higher cost of housing in neighbourhoods with the best schools. While the new School Admissions Code (introduced in 2007 for admissions in 2008) encourages schools to reflect the diversity of the communities they serve without excluding or disadvantaging particular social groups, it is likely that most local authorities will continue to give preference to children from the immediate

15. See Carneiro and Heckman (2003) for a review of the literature. Using data from the British Cohort Study of children born in 1970, Blanden (2006) found that higher early test scores were an important factor in helping children from poor families achieve economic success as adults. Note, however, that some argue that these payoffs decay rapidly unless bolstered with interventions that can continually offset social disadvantages through the whole education sequence (*e.g.* as discussed by Machin, 2006).

neighbourhood. In this context it will be interesting to follow developments in local authorities (such as in Brighton and Hove) that use random allocation/ballot as a means of allocating some of their school places.

An emphasis on competition between schools also tends to go hand in hand with an emphasis on testing and targets – although the government also likes to use the quantitative measures of performance as a means of documenting improvements in standards. Indeed, in contrast with the results of international tests such as PISA and PIRLS, the introduction of education targets for the UK has been accompanied by a significant improvement in educational attainment (particularly at the primary level in England) as measured by the targets themselves. However, an important concern is that the presence of targets may be producing perverse effects and biasing the measures of performance. Such perverse effects – often referred to as “gaming” – have been well documented in the performance management literature¹⁶ and may include: ratchet effects, threshold effects and unmonitored output distortions.¹⁷

Some evidence of gaming in education became apparent when the benchmark target was changed from the percentage of students achieving any five A*-C GCSE grades to the percentage achieving five such grades *including English and mathematics*. Performance on both benchmarks has improved (Figure 6), but the improvement is less when measured using the more challenging indicator. With the benchmark change some schools slipped very considerably down the league tables and some principals admitted that they had pushed children towards taking easier vocational exams to push their schools up the league tables.¹⁸ Since five A*-C GCSE grades including English and mathematics is the normal benchmark for entry into the academic A-level track at upper secondary school, one of the adverse effects of this target may have been to limit the number of students qualifying for university entrance.

Other concerns have also been raised about the prevalence of testing and the risk that pupils are increasingly being “taught to the test”. For example, in their submission to a House of Commons select committee inquiry into testing and assessment, the Qualifications and Curriculum Authority (QCA) – the national authority responsible for testing and assessment in England – noted that although national curriculum tests compare well in terms of reliability and validity with other similar tests across the world, there is evidence that the focus on core subjects has led to pupils being offered a narrower curriculum. Moreover, the QCA report that schools now devote significant time to specifically preparing pupils for the tests and that the most effective teachers are often deployed in the year groups where the tests are administered, with other teachers feeling less responsibility for assessing pupils’ progress. Finally, although teachers’ professional judgements about the achievements of pupils are considered the most fruitful source of information when identifying targets for improvement, the test results attract more public attention, and form the core basis for judgements about school performance and effectiveness (QCA, 2007).

16. See de Bruijn (2007) for a detailed discussion. For a review of gaming effects in the English health sector, see Bevan and Hood (2006).

17. The three main forms of gaming that have been identified are: *i) ratchet effects*, whereby “next year’s” targets are based on this year’s performance, meaning that managers have a perverse incentive not to exceed targets this year even if they could easily do so; *ii) threshold effects*, which may disproportionately reward those with mediocre performance crowded near the target range while providing no incentive for improvement (or even a perverse incentive) for those doing better than the target; and *iii) output distortions*, whereby efforts to achieve the target come at the cost of performance deteriorations in other unmeasured areas of performance.

18. For example, as reported in *The Times* (2007), “Most pupils fail to reach gold standard in GCSE core studies”, 11 January.

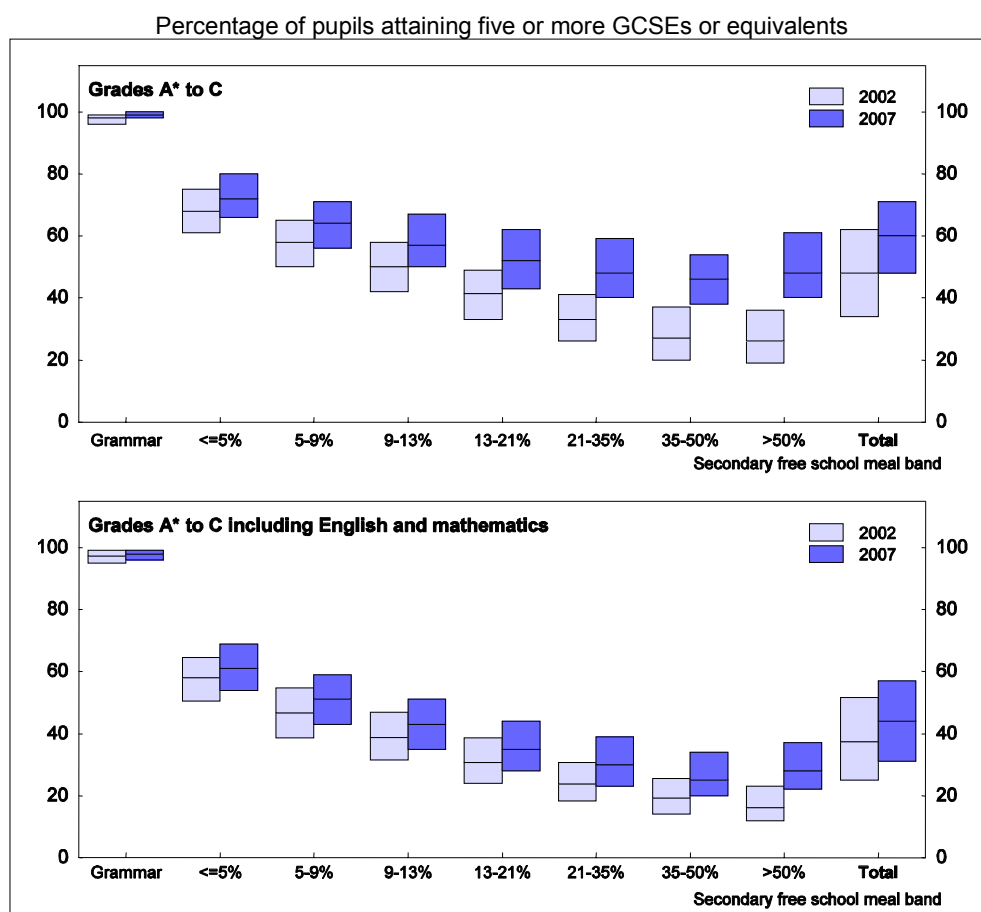
Similarly, an Ofsted report on maths teaching in secondary schools noted that “Although students are able to pass the examinations, they are not able to apply their knowledge independently to new contexts, and they are not well prepared for further study” (Ofsted, 2006). “Teaching to the test” may help to explain how education performance can be recorded as increasing on one metric (national examinations) but decreasing on another (PISA tests, which may be a better measure of students’ ability to apply their knowledge to new contexts).

Consequently, an important question is how to shape performance measurement so as to make it meaningful for schools and teachers as well as for those evaluating performance. De Bruijn (2007) argues that targets encourage perverse behaviour because they take only limited account of the complexity of the profession. Thus, he suggests that performance management should meet the following three criteria if it is to fulfil its function properly: interaction, variety and dynamics. In the case of schools, this would mean that the system of performance management should be developed in *interaction* between evaluators and schools/teachers so as to ensure trust in the system. At the same time, the complexity of teaching children should be reflected in a *variety* of performance indicators, and greater emphasis should be placed on school *processes*, rather than outputs, so that performance management can be *dynamic* – permitting adaptation to changing conditions. While these features are undoubtedly already present to some extent in England’s performance management system, most media and political focus is on the much narrower range of benchmark indicators which may weaken the effectiveness of the system overall.

Another problem with the widespread use of targets is that their incentive effects usually rely on some reward and sanction mechanisms. But these are very difficult to implement in the education sector. In England it is the Permanent Secretary for the Department for Education and Skills who is responsible for meeting most of the government’s education targets, rather than the schools themselves. Furthermore, it is not clear how poorly the Department would have to perform relative to the targets in order for the Secretary to be sanctioned. There may be a case for increasing the accountability of school principals, although improving school performance should be the first priority.

Nevertheless, schools do have incentives to perform well, even if these are not directly linked to the targets. For example, the best performing schools are rewarded with increased autonomy and a light-touch inspection regime.¹⁹ They also benefit from the popularity associated with high rankings on “league tables” published by the press (although the league tables only reflect raw performance, rather than value added). At the other end of the spectrum, the worst performing schools (especially those that fail to meet the key floor target of at least 25% of 15-16-year-olds achieving five or more GCSE subject passes at grades A*-C) come under closer scrutiny from the local authority. For such schools, inspection reports from the OFSTED are more frequent and carry a high weight in decisions on whether to place the school under “special measures” (which often involve the principal being replaced). For schools that are performing a little above the critical floor target for OFSTED action, however, the incentives for improvement may be relatively weak. More recently, the government has begun piloting a different approach to improving performance, which involves a greater focus on pupil progress and testing achievement at appropriate points. The pilots include individual tuition out of school hours in English and Maths for pupils entering Key Stages below national expectations (of whom a significant proportion will be from disadvantaged backgrounds) and the use of financial premia to reward schools who are successful in raising the educational performance of this group of pupils.

19. The highest performing schools (approximately 30% of schools in 2006) are subject to a “light touch” inspection regime. These schools are identified primarily on the basis of performance statistics and their previous inspection report.

Figure 6. Attainment gaps across schools by deprivation level¹

1. The rectangular boxes represent the difference between the upper and lower quartile containing 50% of the schools in each free school meal band. The solid line across the rectangle represents the median school.

Source: Department for Children, Schools and Families.

The existence of under-performing schools, and the difficulty of turning them around, also highlights an important weakness with a policy that emphasises school choice. Even if all parents are fully informed, there will always be some students who miss out on the school of their choice. Moreover, because wealthier parents will always have the choice of sending their children to a private school, it is children from the lowest socio-economic classes who are most likely to end up in the worst schools. This suggests a strong case for an increased focus on raising the education standards of all schools. One way to do this may be by directing additional resources towards pupils from the lower socio-economic classes, although there is often some resistance to this at the local authority level (see below). In addition, however, since individuals in less advantaged positions often act in ways that serve to perpetuate the *status quo* (Erikson and Goldthorpe, 2002), improved social mobility may require complementary policy interventions beyond simply ensuring equal study opportunities. Some lessons may be learned from the countries with the best-performing education systems, such as Finland (see Box 3), although different societal values are likely to prevent a wholesale transfer of an education system from one country to another.

Box 3. Lessons from Finland: the role of societal values

Much of the Finnish success in education performance – Finland consistently performs the best in the PISA tests– can be attributed to Finland’s equality approach in comprehensive education, where standards are raised by lifting the many rather than by pushing a privileged few. There is no streaming in the system and the small variance in the PISA results can be traced back to the use of four different levels of potential intervention when pupils fall behind – by the teacher, school assistants, the special needs teacher and the multi-disciplinary teams including e.g. a psychologist, a social worker or someone from public housing services. Other factors that are considered to have a positive influence are the small size of schools, thorough teacher training and low mobility of teachers and students (OECD, 2005b).

Interestingly, and unlike the United Kingdom, Finland places no emphasis on individual testing or measurement-driven accountability. Rather, as discussed in a recent case study report of Finnish School Leadership (Pont, Nusche and Hopkins, 2008) the high performance of Finnish schools is attributed to a strong commitment to, and widespread culture of, learning in school and society more widely. This culture of learning is reflected in the pervasive and increasing attention that educators pay to self evaluation as a way to improve their schools. It is also supported by Finnish society which has a high regard for education and for teachers; indeed, entry into teaching is demanding and highly competitive, with only 1 in 10 applicants being admitted. The public also supports the goal of the education system for there to be “no social exclusion... so that nobody is forgotten”. For schools suffering from failure and difficulty the local authority tends not to focus on removing staff, exerting control, or imposing interventions but instead asks “What has gone wrong? How can we help the school?” The Finnish system does not advocate competitive choice between schools or order its schools in public performance rankings. The philosophy of Finnish school leadership training providers is that “all schools must be good enough and there is no reason to have elite schools and bad schools”.

Given the important role of Finland’s distinctive social values that underpin the school system, it is not clear how easily Finland’s exceptional educational performance could be transferred to other countries, such as the United Kingdom. In this respect, one of the key lessons from Finland for other countries may be that successful and sustainable education reform cannot be undertaken alone but is directly linked to widespread social and economic reform.

Improve incentives for good teachers to go to poor schools

Compared with encouraging disadvantaged pupils to move to good schools, it may be much easier, and more effective, to encourage good teachers to move to bad schools. Given that good teachers are often attracted to schools with a high proportion of pupils from advantaged backgrounds, efforts to narrow the gaps between pupils from different backgrounds should consider ways to identify the best teachers (perhaps using CVA measures²⁰) and put in place systems and financial incentives to encourage them to move to, and remain at, the most disadvantaged schools (Nickell, 2004). One related avenue has been the introduction of merit pay for teachers, which has been found to have a positive impact on student achievement in some subjects in England (Atkinson *et al.*, 2004). This avenue for encouraging higher teacher performance is promising, given the importance of teaching quality. For example, Hanushek (2003) cites studies which suggest that having five years of good teachers in a row (*i.e.* teachers at the 85th quality percentile) would overcome the average achievement deficit between pupils from disadvantaged backgrounds and those from higher income families.²¹

To date, however, there have been only limited initiatives to encourage the best teachers to move to the most disadvantaged schools. One of these, *Teach First* is a recruitment initiative that has aimed at placing high quality graduates into disadvantaged schools. Initial results from this programme have been

20. Currently, however, CVA is currently only available for the whole school and it is not possible to link pupil progression to individual teachers using national data.

21. Unfortunately, the characteristics of good teachers are not well defined, making it difficult to select good teachers through legislation or regulation. For example, a number of studies, including Hanushek (2003), have found little correlation between teacher qualifications and teacher quality, or between teachers’ salaries and teacher quality. The use of merit pay may thus be more likely to reward the best teachers.

positive, with generally very high quality candidates and half of the intake deciding to remain in teaching. But much more should be done. For example, central government funds could be used to provide bonuses to teachers at disadvantaged schools who consistently obtain higher than expected gains in student performance. Clearly this would require a very different set of teacher management policies from those currently in place.²² The government has, in its 2007-08 Remit Letter to the Training and Development Agency for Schools (TDA), asked it to look creatively at how it can use the resources and levers at its disposal to ensure that schools serving areas of high disadvantage have good-quality teachers and support staff in post. This might include consideration of how financial incentives could be used.

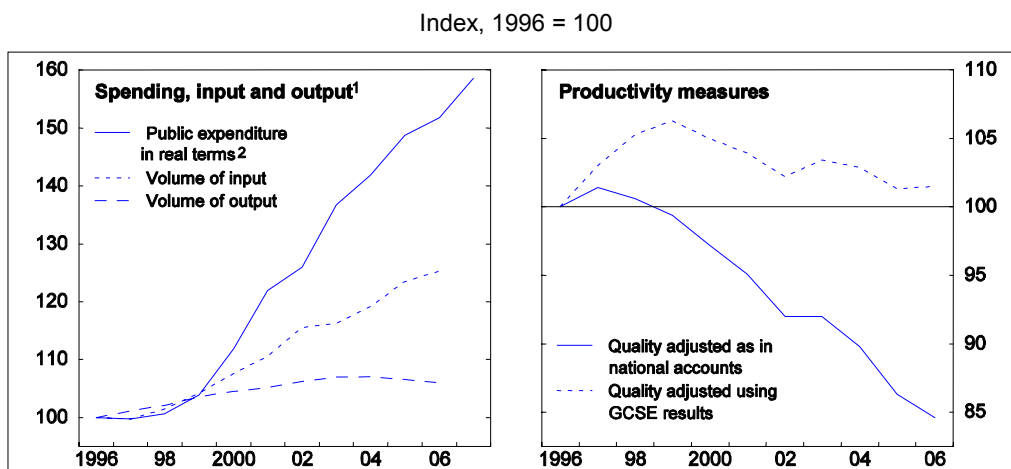
Better allocate spending to address inequities.

Education spending in the United Kingdom is not particularly high by international standards, but it has risen from 4.7% of GDP in 1996-97 to 5.9% in 2006-07. Looking ahead, the government has announced that education spending would remain constant as a share of GDP over the next few years. The view of the government is that “additional expenditure has a positive, if relatively modest, impact on attainment” (DfES and HM Treasury, 2005).

One way of assessing the efficiency of education spending is to look at measures of productivity in the education sector. Following the Atkinson review (Atkinson, 2005), the national account measures of government output and productivity are being gradually improved and several measures of education productivity are now available. The main (national accounts) measure of productivity is now based on a volume measure of input which makes adjustments for estimates of teachers’ pay and uses a new measure of capital services. The national accounts output measure also includes a quality adjustment to proxy for the improvements that are indicated by various domestic measures of pupil performance. An alternative measure of productivity adjusts the volume of output for changes in quality using the upward trend in GCSE exam results (ONS, 2007).²³ This alternative measure suggests that education productivity in the UK increased by 2.1 percentage points per year from 1996 to 1999, before falling by about 0.7 per cent per year more recently (Figure 7). While quality adjustment using GCSE exam results is in line with the Atkinson Review recommendations, one potential problem with it is that the GCSE measure of progress is also a school output target, suggesting a risk of target-driven output distortions. In the case of all productivity measures, it is worth noting that academic attainment is not the only outcome of the education system. The government’s aim is for education to enhance the wellbeing of children and young people more generally, but wellbeing is much harder to measure than attainment. Nevertheless, results from an OECD project aimed at drawing cross-country comparisons of efficiency in public spending on primary and secondary education also suggest that the United Kingdom – along with other OECD countries – could improve the efficiency of education spending (Sutherland *et al.*, 2007).

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22. At present, most teachers move through the main salary scale by one point for each year of satisfactory service. Schools have the discretion to advance excellent performers by two points in any year, although in practice only around 1% of teachers have been awarded such double increments. More experienced teachers (those on an upper pay scale) also have the possibility of performance-based salary increments. However, there are currently no incentives to encourage the best teachers to move to under-performing schools. Like most countries, the UK has teacher contractual arrangements that make significant changes difficult.
23. The National Accounts output series is based on the number of full-time-equivalent pupils in the state sector adjusted by a constant +0.25% per year. The alternative measure attempts to adjust more carefully for performance increases using measures of progress on national tests.

Figure 7. Measures of education productivity



1. Input and output volumes consistent with current national accounts.
2. Nominal central government and local authority spending deflated using the GDP deflator which can be interpreted as the volume of alternative consumption foregone.

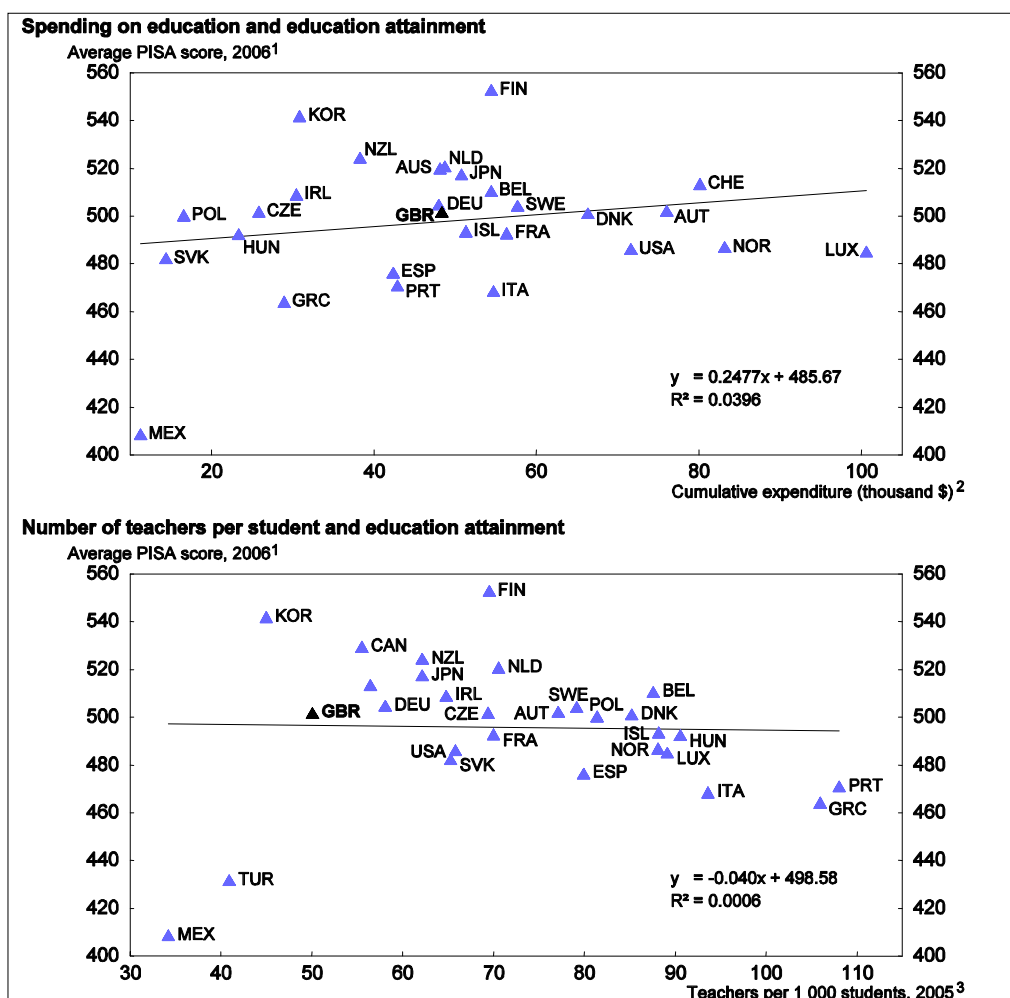
Source: ONS (2007), "Public Service Productivity: Education", September, available at: www.statistics.gov.uk/articles/nojournal/Education_productivity_2007_main.pdf; HM Treasury (2008), *Public Expenditure Statistical Analyses (PESA)*, HM Treasury and Office for National Statistics.

The econometric literature on the relationship between education spending and pupil achievement also suggests a need to be very careful about how additional resources are spent. While different methodologies often produce different findings, most reviews of the literature tend to reach the same conclusion: that some measurable school inputs do sometimes matter, but that the magnitude of the effects found are quite small, and that it is therefore hard to provide unequivocal support for the idea that more resources are required to achieve higher educational outcomes.²⁴ For example, consider the debate on the effectiveness of reducing class sizes; some researchers (Hanushek, 2003) conclude that smaller class sizes have no distinguishable effect on test scores, while others (Krueger, 2003) interpret the same literature differently and argue that class size reduction does improve student achievement. Even taking the most favourable estimates, however, Carneiro and Heckman (2003) argue that the return on reducing pupil-teacher ratios is sufficiently low as to render a focus on reducing class size unwise.²⁵ The OECD PISA database also suggests that higher spending does not automatically translate into higher performance; a cross country correlation between education inputs and PISA performance finds no clear positive correlation (Figure 8). Nevertheless, governments often face heavy lobbying from parents and teacher unions for smaller class sizes, despite no conclusive evidence of a direct link with educational achievement.

24. For example, Vignoles *et al.* (2000), Hanushek (2003) and Carneiro and Heckman (2003).

25. Consistent with the US literature, a review of the UK literature (Vignoles *et al.*, 2000) concluded that there is almost no UK evidence that smaller class size leads to better outcomes. Dustmann *et al.* (2003) found some positive impact of smaller class size in the United Kingdom on the decision to stay on in full time schooling at 16. However, the estimated impact is very small.

Figure 8. Higher spending does not automatically translate into higher attainment



1. Student performance on the combined reading, scientific and mathematics scales. For the United States, the 2003 score for reading has been used in the calculation.
2. Estimated cumulative total spending between 1993 and 2002 on a student aged 15 in 2002, converted to 2002 US dollars using purchasing power parities for private consumption. Public institutions only for Hungary, Italy, Luxembourg, Poland, Portugal and Switzerland.
3. In primary and secondary education based on full-time equivalents. 2003 data for Canada, Denmark and Luxembourg; 2004 for Norway.

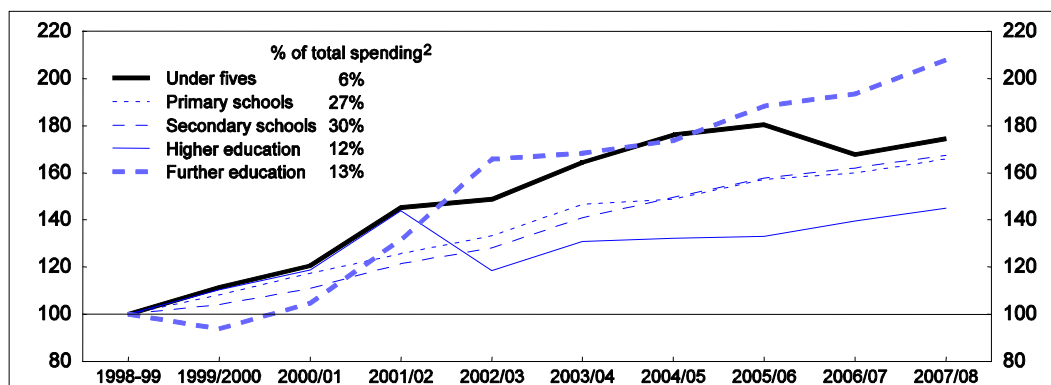
Source: OECD (2007), *PISA 2006: Science Competencies for Tomorrow's World and Education at a Glance*, OECD Publishing; Sutherland, D. *et al.* (2007), "Performance Indicators for Public Spending Efficiency in Primary and Secondary Education", *OECD Economics Department Working Papers*, No. 546, OECD, Paris.

Of course, these findings do not imply that the level of resources is irrelevant. As discussed earlier, there is significant evidence that high quality interventions in the early years can effectively promote learning and improve parenting skills in poor families and that higher quality teachers can raise the test scores of students. Moreover, as Hanusheck (2003) interprets the literature: "There clearly are situations where small classes or added resources have an impact. It is just that no good description of when and where these situations occur is available, so that broad resource policies ... may hit some good uses but also hit bad uses that generally lead to offsetting outcomes".

The UK government has made a commendable effort to identify where the impact of increased spending is greatest. All sectors of the education system have benefited from higher spending. Until

2005/06 pre-school education had benefitted the most. However, spending at the pre-primary level fell in 2006/07 and the total increase is now more in line with that for primary and secondary schools (Figure 9).

Figure 9. Real expenditure growth has increased across all levels of education¹
Index, 1998/99 = 100



1. Education and training expenditure in current prices converted to constant prices using the GDP deflator.
2. Per cent of total education and training expenditure, average 1998/99-2007/08.

Source: HM Treasury, *Public Expenditure Statistical Analyses* (PESA), HM Treasury and Office for National Statistics.

Within the primary and secondary school budget, the government has concluded that the impact of additional spending "... is greatest when expenditure is targeted on the most deprived schools and towards pupils who are eligible for free schools meals". More specifically, the government has claimed that the impact of a marginal increase in expenditure on students aged 14 is three times as great for mathematics and four times as great for science when targeted on pupils eligible for free school meals (DfES and HM Treasury, 2005). The unusually low level of intergenerational social mobility in the United Kingdom (discussed earlier) also suggests a need to direct resources at programmes to improve the outcomes of those from deprived backgrounds. Blanden *et al.* (2007) suggests that this could be done either by universal interventions that are more effective for poor children (such as high quality pre-school) or by directing additional resources at poorer schools or communities.

Unfortunately, the government's efforts to ensure that increases in education spending are spent where the return is highest have not always been implemented as intended. This is because the control over the allocation of funds to individual schools belongs not to the central government but to the local authorities. Since different local authorities use different funding formulas, schools in deprived areas receive greatly varying levels of funding depending on their local authority's approach (Box 4). As a result, the government has concluded that "the impact of funding in boosting the attainment of children from deprived backgrounds is not being maximised".

There are a number of reasons why local authorities have not allocated a higher proportion of funding to the most deprived schools. A government survey of local authorities found that some authorities were simply unaware that they received funding specifically to meet the costs of deprivation. Others were aware, but did not think deprivation-based funding was very important. Many local authorities preferred to treat schools equally. Some local authorities even reported that their advisory bodies (the schools forums) had criticised the targeting of funds, preferring a "flatter" distribution than was warranted by the incidence of deprivation (DfES and HM Treasury, 2005).

Box 4. Funding formulas versus flexibility: the allocation of education spending in England¹

In England, there is no national funding formula through which the central government funds schools directly. Rather, each of the 150 local authorities (LAs) receives bulk education funding from the central government and is responsible – in consultation with the schools forum² – for distributing it between the pre-school, primary and secondary schools in that area.

Since 1990, when local management of schools first began, at least some proportion of the school funding that local authorities have received has been intended to address social deprivation. During most of the 1990s the formulas used by LAs to fund schools were subject to approval by the central government, and there was some expectation (but no requirement) that formulas would include provision for funding for pupils with special educational needs (SEN). During this period some LAs first began to use eligibility for free school meals (FSMs) as a proxy indicator for “low-level” SEN.³ Since the current government came to power, however, increasing emphasis has been placed on the role of deprivation funding. For example, authorities were urged to review their formula provision for deprivation in 1998; subsequently a requirement (albeit very modest) was introduced into the regulations (see below).

The education resources directed from the central government to the local authorities are largely based on a basic entitlement for all pupils attending schools in that LA, together with top-ups to address the costs of additional educational needs (AEN), population sparsity, and area costs (*i.e.* to address the variability of costs – principally labour costs – between different parts of the country). The portion of funding intended to address deprivation costs is currently within the allocation for Additional Educational Needs (AEN). In 2005/06 it amounted to around £1 630 per year per pupil with AEN.⁴ This funding is expected to meet the costs directly associated with social deprivation, and the costs of supporting children for whom English is not the native language. Separate funding is delivered to meet the costs of supporting children with “severe” SEN. As a baseline, local authorities are funded on the assumption that at least 12% of pupils have AEN. The AEN top-up is thus provided to those authorities where more than 12% of pupils have AEN. The percentage of pupils with AEN is estimated using national socio-economic indicators.⁵

After deducting central expenditure from a local authority’s Schools Budget, the authority has considerable flexibility over how to allocate funding among the schools in that region, including over how much funding is actually allocated at the local level to meet the costs of AEN. Essentially, LAs have been free to use whatever school funding formula they wish, with the only requirement related to AEN being that LAs must have at least one factor in their formula based on the incidence of social deprivation. However, in reality this requirement does not impose any significant obligation on LAs, since it does not imply a minimum of spending on deprivation.⁶

In addition to allocation flexibility, LAs have also had the possibility of using council tax revenues to provide additional funding for schools (the majority of cases) or of allocating less than the full schools budget to schools, with the remainder being used to meet other LA outlays (the case of around one-third of LAs). This freedom to provide less than the full schools budget to schools has now been curtailed with the introduction in the 2006/07 year of a new schools funding system, known as the Dedicated Schools Grant (DSG). Under this system, LA Schools Budgets are fully funded by the central government, and LAs are obliged to allocate the full amount to schools. LAs can add to this funding if they choose, but with the advent of the ring-fenced DSG, most do not. For the initial two years of the DSG, the amount that each authority receives is partly based on up-rating previous allocations to schools. This means that for three years at least, schools that had previously part-funded school spending with council tax revenues are receiving higher per-pupil allocations from the central government than those that were previously under-spending their schools allocation. It has not yet been decided whether to return to a formula-only funding approach from 2011 or whether the higher education allocations received by the first group will be locked in for longer.

Under the DSG system, LAs retain the flexibility to allocate funding between schools as they choose. However, in light of evidence that LAs have not accurately or consistently directed the deprivation element of the AEN funding towards schools in deprived areas, the central government is now exerting increased pressure on LAs to progress towards a funding formula which targets deprived pupils adequately from the 2008/11 funding period. The implicit threat has been made of greater conditionality of allocations in the case that LAs do not make sufficient voluntary progress. However, this is clearly seen as being a last resort. One possible disadvantage of the DSG system is that it is now more complicated to derive a straightforward AEN figure for each authority. However, the government has stated that it will ensure that it is clear how much of an authority’s total DSG allocation is intended to address AEN, and how much to address deprivation.

One of the main challenges in rectifying the current situation is that of transition. Because of the relatively small amounts currently being allocated for deprivation in some local authority areas, many of the most deprived schools should be given a considerable increase in funding. However, in most cases this would require reduced funding for the least deprived schools, which is politically difficult, even if it would represent a significant improvement in the efficiency of education spending. The transition to more efficient funding formulas may also be undermined by the Minimum Funding Guarantee (MFG) which, introduced in 2004/05, guarantees all schools a minimum percentage increase in their funding per pupil from one year to the next. While the goal of this guarantee is very worthwhile – to provide

schools with stability of funding – it may also serve to unduly constrain the transition to more efficient and equitable funding formulas. The specific guidelines for the MFG do permit local authorities to put in place their own phasing arrangements. However, it is stressed that this is a facility that should be used only in exceptional circumstances (with the approval of their schools forums)⁷ and if a proposal affects more than 20% of an authority's schools (50% of pupils from 2008/09), the authority must also seek approval from the Secretary of State.⁸ For local authorities that are already reluctant to increase the degree of funding differentials between schools, the default of history-based funding underpinned by the MFG could easily undermine the government's other goals.

The central government should encourage local authorities to make a relatively fast transition to more efficient funding. In conjunction with other incentives, this would be facilitated by taking deprivation-targeted funding out of the formula used to determine the MFG so that local authorities can proceed in this direction without having formally to apply for permission.

1. This box draws heavily on DfES and HM Treasury (2005), and on discussions with Department for Education and Skills staff. While this box focuses on England, it should be noted that Welsh local authorities have even greater freedom to determine funding for schools than do English LAs; they are responsible not only for allocating funding between schools but also for determining within the overall available budget how much they allocate to education.
2. Each local authority is required by law to set up a schools forum, a body representative of local schools, made up of at least 15 people. The schools forum must be consulted on all plans for school spending and for changes to the funding formula.
3. Low-level SEN refers to less severe special educational needs. Funding for more severe SEN is delivered separately and is not covered in this box.
4. This figure stems from a baseline cost of meeting AEN of £1 780, as estimated by PricewaterhouseCoopers (2002), reduced to £1 460 to account for the proportion of relevant costs which are funded through grants. For example, the Leadership Incentive Grant has provided grants of up to £135 000 directly to the most deprived secondary schools (scheme being modified in scope from 2006).
5. Indicators currently used include: the number of children in each LA of parents on income support; the number in receipt of a working family tax credit; the number of 5-10-year-olds with English as an additional language; and the number of children from low-performing ethnic groups.
6. At least one authority implemented this rule by giving all its schools £1 each through the social deprivation factor. At the other end of the spectrum, an estimated 12 authorities provided more deprivation funding to schools than would have been implied by the central government formula.
7. "Schools Forum Guidance Note 3 – the minimum funding guarantee", accessed 12 September 2007 as document number 4 – The Minimum Funding Guarantee at: <http://www.teachernet.gov.uk/docbank/index.cfm?id=9369>.
8. Details can be found at: <http://www.teachernet.gov.uk/docbank/index.cfm?id=11544>

In response to these problems the government announced that local authorities must discuss with their advisory bodies (the schools forums) how they can better target deprived pupils. The central government has also begun to publish exam results for free school meal (FSM) and non-FSM pupils by local authority area so as to highlight which local authorities are making the most progress in closing the gaps. Nevertheless, many local authorities are likely to resist, particularly in cases where re-allocating deprivation funding towards the most deprived schools according to the assumptions used in the national funding formula would result in reduced funding for the least deprived schools. Even in less extreme cases, many local authorities do not support the central government focus on deprivation. For example one local authority responded: "... generalised exhortations to widen (funding) differentials are not likely to be successful. The majority ... will tend to want smaller scale differentials than the Department may envisage. Greater prescription may be needed if these aspirations ... are to be achieved" (DfES and HM Treasury, 2005).

If sufficient progress is not made voluntarily then the central government has said that it would consider imposing more conditions on funding allocations. But this is clearly seen as a last resort. There is little political willingness to be associated with funding re-allocations that may result in reduced funding for some schools in the medium term, even if the current situation is recognised as inequitable. In addition, there remain advantages to local autonomy. Not only does it permit flexibility in response to local needs, but it can also encourage innovative responses to problems.

In this context, it seems that more should be done to encourage a fast transition to a more equitable distribution of funding, while safeguarding local authority autonomy. In particular:

- To make it clearer how funding should be allocated in the future, the central government should consider promoting a “first best” national benchmark formula, with local deviations encouraged in cases where local authorities can identify relevant local factors that are not taken into account in the benchmark formula.²⁶ Such an approach would safeguard flexibility for local authorities to respond to local needs when required, while also providing local authorities with more guidance than at present. Such an approach could also facilitate the funding allocation process for those local authorities that face resistance within their communities and from their schools forums.
- To promote transition away from history-dominated formulas, the government should consider offering local authorities greater flexibility to depart from the minimum funding guarantee (MFG) methodology, so that local authorities that wish to promote a transition to more equitable formulas do not necessarily have to apply to the Secretary of State for permission to deviate from the MFG methodology (see Box 4 for further discussion). While a rapid transition would be ideal from the perspective of spending efficiency, this would need to be weighed against the possible costs caused by turbulence in funding levels for some schools. In such cases, longer transition periods should be acceptable – but the medium-term goal should be made clearer than it is at present.
- Another, more radical approach, might be to consider a differentiated voucher system where pupils from poorer families receive vouchers that are valued more highly than those for the general population. The Chilean voucher system is being modified in such a way, with the new differentiated vouchers to be introduced this year (OECD, 2007b). The advantage of this approach – if combined with levers to ensure that the additional money is used for the disadvantaged child – is that it would create incentives for schools to focus attention on attracting pupils from disadvantaged backgrounds by more directly addressing their educational needs.

More effort also needs to be made to carefully monitor and evaluate education policy interventions so as to get a better understanding of what works, particularly with respect to enhancing the educational performance of those from disadvantaged families. While the UK government has devoted considerable effort to identifying the most cost effective uses of education spending, significant progress is yet to be made in determining the effects of different resource mixes in schools. Indeed, a significant focus (at least in terms of communication with the public) is still placed on raising input levels. For example, the government’s promise to close the funding gap between state and private schools²⁷ does not seem to be justified. While it is true that pupil performance is higher at private schools than at state-funded schools, it is not clear to what extent this is due to different student characteristics, the peer group effect, to better funding, or to better teaching quality. With respect to the impact of higher expenditure and other policy

26. DfES and HM Treasury (2005) found *no examples* of local authorities linking the allocation of deprivation funding to the assumptions in the national formula about the typical costs of additional educational needs (*i.e.* the PricewaterhouseCooper’s figure quoted in Box 2.3).

27. In 2005/06, independent (private sector) day schools spent in the region of £8 000 per pupil compared with roughly £5 000 in the public (maintained) sector. The 2006 Budget set out the government’s aim to increase real public school spending per pupil to 2005/06 private sector day school levels, although the timetable for achieving this goal was not specified. Goodman and Sibieta (2006) show that approximately £600 additional spending per pupil (in real terms) was already implied under existing spending plans by 2010/11, leaving further increases of £2 400 per pupil (in real terms) before the £8 000 target will be met. If school spending per pupil were to be increased in line with real GDP growth (approximately 2½ per cent a year) then it would take 14 years to meet the target. By then private sector spending, which has been growing broadly in line with “service sector” inflation rates, would undoubtedly be much higher.

initiatives to date, evaluation is complicated by the fact that some of the measures of performance may have been biased by target-driven output distortions. In addition, the lags between expenditures and outcomes are long, so some improvements may be yet to come through.

Summary and Recommendations

Whereas the United Kingdom often ranks very highly on certain measures of economic policy and outcomes, this is certainly not the case when it comes to educational standards. The test-dominated education system in the United Kingdom has pioneered the use of school benchmarking techniques and the use of targets to raise school quality. However, targets may have biased some national measures of education performance, and there is relatively little evidence of improvement in performance when evaluated using international tests of cognitive ability, such as PISA and PIRLS. Socio-economic background plays an important role in explaining education performance, and the government has tried to address this through the use of funding formulas which direct additional resources to areas with a higher proportion of pupils from deprived backgrounds. There has been some improvement in the most disadvantaged schools but pupils in the middle and lower half of the distribution continue to perform particularly poorly relative to students in countries with the best performing education systems. Overall, the socio-economic gaps remain large. One explanation may be that local authorities and schools are not distributing deprivation funds as intended by the central government, resulting in outcomes which can be seen as inequitable. Stronger measures may be required to correct this imbalance. While presenting only a general overview of the challenges, this paper suggests that some new approaches, together with a renewed sense of urgency, may be required to address the United Kingdom's relative underperformance in literacy and numeracy. The recommendations suggested in this paper are summarised below:

- Increase regular participation in quality early childhood education, and continue to target childcare services provided by Sure Start Children's Centres to disadvantaged families. Sustained intervention once disadvantaged children have entered primary school will also be required, to ensure that the benefits of pre-school interventions are sustained.
- Continue to promote a focus on the acquisition of core literacy and numeracy skills for pupils at primary and secondary school.
- Ensure that the focus on core skills is not compromised by the goal of expanding the average number of years of schooling. Emphasise the role of core literacy and numeracy skills within the new Diplomas. Consider introducing a higher age for compulsory participation only for those students who have not already achieved a certain minimum standard of core skills by age 16.
- Evaluate returns to the new diplomas closely. When A-levels are reviewed vis-à-vis the new Diplomas in 2013, give serious consideration to moving towards a more unified framework of qualifications as originally recommended by the Tomlinson report.
- Ensure continued participation in international tests of cognitive ability, such as PISA and PIAAC.
- Reduce the focus on testing and targets and put more focus on supporting weak students and schools.
- Design all remaining targets in a way that limits the potential for gaming, by ensuring an interactive performance management system that captures the complexity of the education process. Ensure that remaining key performance measures are not based on targeted outputs.
- Encourage a public debate about whether the goal of the education system should be to make all schools high performers, and what societal values that would reflect.
- Consider ways of encouraging the highest quality teachers to move to the most disadvantaged schools – such as by giving bonuses for high quality teaching performance at such schools.
- Promote a national benchmark formula for local authorities to use in allocating funding between schools, while still permitting flexibility (*i.e.* deviation from the benchmark formula) to meet local needs.

- Promote the transition to a more efficient allocation of funds by providing standard procedures for taking deprivation-targeted funding out of the formula used to determine the Minimum Funding Guarantee. Permit smoothed transitions to the improved formulas in cases where significant school funding volatility for some schools would result. However, make clear the medium-term goal of equitable funding allocation.
- Evaluate the pros and cons of introducing a differentiated voucher system of funding (as in Chile) where pupils from poorer families receive vouchers that are valued more highly than those for the general population.
- Encourage more research into determining which resource mixes within schools are most successful at narrowing socio-economic gaps.

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