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The English Baccalaureate: how not to measure school performance

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Abstract

This paper challenges the view held by the UK Government that the introduction of the English Baccalaureate will lead to an improvement in educational outcomes in secondary education. Evidence is presented to show that this new qualification is biased against disadvantaged pupils from low-income families, pupils with special needs, and pupils who have little inclination to study a foreign language. Furthermore, the English Baccalaureate is deeply flawed when used as a school performance indicator and should not be included in the School Performance Tables.

Keywords English baccalaureate Performance indicator Secondary schools

The English Baccalaureate: how not to measure school performance

This paper challenges the view that the introduction of the English Baccalaureate will lead to an improvement in educational outcomes in secondary education. It argues that this new way of measuring school performance is both unfair and elitist. In particular, it could have harmful consequences for disadvantaged pupils from low-income families and for pupils who have little inclination to study a foreign language. The English Baccalaureate is deeply flawed and should not be used to measure a school's performance.

The School Performance Tables and the English Baccalaureate

The proportion of pupils in each school achieving at least five A*-C grades (or equivalent) has been extensively used as an indicator of a school's academic success since the creation of the first set of School Performance Tables in 1992 by the then Conservative Government. Several modifications have been made to these annual Performance Tables over the past two decades, including the publication of additional indicators.

The first major change was the addition of a value added indicator (referred to as Contextual Value Added) in 2002. The aim was to measure the progress made by pupils between the Key Stage 2 tests, taken at 11, and the Key Stage 4 exams, taken at 16 (the end of compulsory education). Contextual Value Added is an attempt to control for factors likely to affect a pupil's progress that are outside the school's sphere of influence. These include the pupil's prior attainment, family background and factors relating to a pupil's neighbourhood. In practice, it is only possible to control for a limited range of factors due to data availability. The variables include: a pupil's gender and ethnicity, whether a pupil's first language is other than English, whether a pupil has special educational needs, and a pupil's eligibility for free school meals (to reflect the influence of poverty).

A second change, made in 2006, was less fundamental than the introduction of the value added indicator. It simply involved adding the requirement that the achievement of five or more A*-C grades had to include English and maths. This modification was introduced, at least in part, to prevent schools from improving their performance by encouraging their pupils to take so-called 'soft options', such as qualifications based entirely on coursework, in order to boost the school's measured performance.

The most recent change was the introduction of the English Baccalaureate (E-Bacc) in 2010. The education minister decided that the primary goal of secondary schooling is to "pursue a broad and rounded range of academic subjects until the age of 16" and that a necessary condition is that the combination of A*-C grades should include English, maths, two sciences, history or geography, and a foreign language. In order to

encourage the take-up of the E-Bacc, the Government is to "give special recognition in the performance tables to those schools which are helping their pupils to attain this breadth of study" (Department of Education 2010a, p.44). It is worth stating at the outset that it is the Government's ultimate intention to abolish the performance indicator based simply on the proportion of pupils obtaining *any* five A*-C grades. The E-Bacc is to become the basic standard of achievement at 16 and the intention is to mark this achievement by issuing a certificate to each successful pupil (Department of Education 2010b, p.3).

Motivation behind the English Baccalaureate

The motivation to create the E-Bacc came directly from the education minister, Michael Gove, who is concerned about the sharp decline in the teaching of languages in secondary schools following its removal as a core subject in the national curriculum in 2004. The minister clearly believes that studying a foreign language is important and should be encouraged rather than simply being offered as an option.

According to the minister, the baccalaureate system adopted in many European and Asian countries means that foreign pupils benefit from a broader education at secondary level than pupils in England. In particular, the minister believes that the flight from languages "not only breeds insularity, it means an integral part of the brain's learning capacity rusts unused"[1]. Although such bland and unsubstantiated assertions made on national television should not be taken too seriously, it is worrying that blind faith in the baccalaureate could lead to a reduction in subject choice, which in turn could have a negative impact on educational outcomes.

The sudden and unexpected appearance of the E-Bacc surprised the educational establishment when it was added to the School Performance Tables in 2010. Criticism of the E-Bacc has so far come mainly from school heads. Their main objections are: first, the E-Bacc was introduced retrospectively without consultation, so there was no chance for educationalists to argue the case against the effective reinstatement of languages in the core curriculum. Second, there already exist several well-established performance indicators and the introduction of the E-Bacc shifts the goal posts yet again without a careful consideration of the consequences for student motivation and parental choice. Third, many heads have argued that restricting one of the required subjects to history or geography is unduly restrictive and the consequent reduction in student choice could have serious adverse effects on motivation and hence attainment for some pupils. Why, for instance, should creative or vocational subjects based on developing personal skills be excluded, especially as these are often valued by employers? Fourth, the adoption of the E-Bacc as a performance indicator will lead to an even more favourable outcome for schools able to attract pupils with the highest academic ability. Disparities in performance between schools are likely to widen still further.

The English Baccalaureate: some evidence of winners and losers

The E-Bacc has serious drawbacks as a measure of school performance. These include:

[1] See http://www.guardian.co.uk/politics/2010/sep/05/michael-gove-baccalaureate-gcse

1. The E-Bacc naturally favours schools that decided to specialise in languages under the specialist schools initiative of previous governments. It ignores achievement in subjects such as music, drama, technology and business studies, no matter how important these are to the educational development and future prospects of some pupils. Schools specialising in languages, for example, had 30.9% of pupils achieving the E-Bacc compared to only 10.8% in schools specialising in business studies (see Table 1).

TABLE 1 Percent of pupils achieving the English Baccalaureate 2010: by school specialism

	Number of schools	% achieving the English Baccalaureate
No specialism	305	6.0
Business & Enterprise	266	10.8
Sport	364	11.3
Engineering	68	13.7
Arts	474	14.0
Technology	503	14.8
Maths & Computing	295	16.5
Humanities	152	19.6
Science	352	22.5
Languages	222	30.9
Music	31	33.5

Notes:
1. Schools with more than one specialism are classified in the subject in which they initially obtained a specialism.
2. The English Baccalaureate is as follows: English, maths, two sciences, history or geography, and a foreign language.
Source of data: Secondary School Performance Tables, Department for Education.

2. The E-Bacc discriminates in favour of schools which attract the most academically able pupils, such as grammar schools, which have a long tradition of language teaching over all five secondary school years (between 11 and 16). This is clearly reflected in Table 2, which shows that grammar schools have 67.5% of pupils achieving the E-Bacc compared to only 13.3% in comprehensives and 6.3% in the moderns. Substantial disparities also occur between different types of school: academies have only 5.4% of pupils achieving the E-Bacc compared to 21.3% in voluntary-aided schools.

3. The E-Bacc discriminates against schools with a high proportion of pupils with special educational needs, especially those with learning difficulties, who may nevertheless do well in more vocational subjects. One in three pupils in schools with the *lowest* proportion of pupils with special needs, for example, achieved the E-Bacc. This falls to around one in twenty pupils in schools with the *highest* proportion of pupils with special needs (see Table 3).

4. The E-Bacc strongly discriminates against schools with a high proportion of pupils from low-income families. Around one in three pupils from schools in the lowest quintile of pupils eligible for free school meals achieved the E-Bacc in 2010 compared to around one in twenty pupils in the highest quintile of pupils eligible for free school meals (see Table 3). Further evidence of the bias inherent in the E-Bacc indicator is provided in Figures 1 and 2. When schools are divided into quintiles, the distribution of E-Bacc scores is

seen to be widely spread for schools with a low proportion of pupils eligible for free school meals (Figure 1). This contrasts starkly with the very high concentration of low E-Bacc scores (i.e. below 5%) for schools with a high proportion of pupils on free school meals (Figure 2). Schools with a high proportion of pupils on free school meals have little chance of attaining even a moderate E-Bacc score if the 2010 outcomes are anything to go by.

TABLE 2 Percent achieving the English Baccalaureate: by type of school

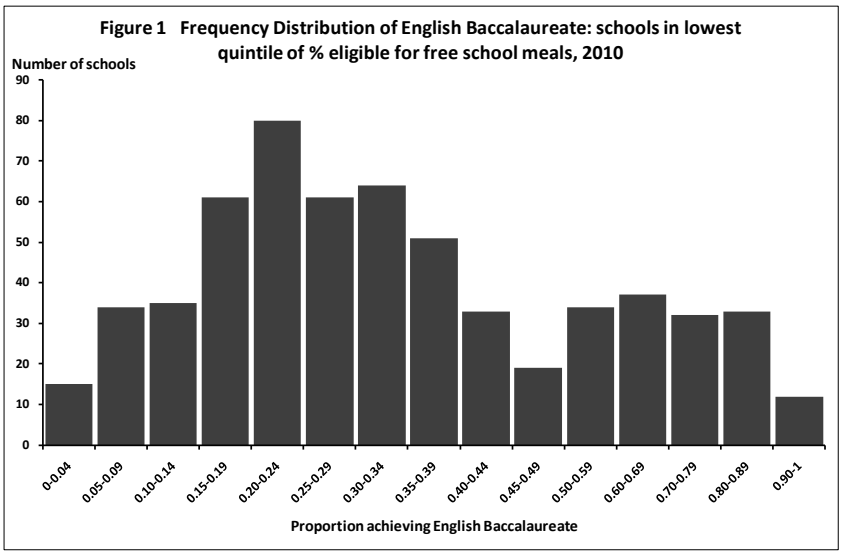
	Number of schools	% achieving the English Baccalaureate
School admissions policy		
Modern	158	6.3
Comprehensive	2629	13.3
Selective	164	67.5
School governance		
Academy	187	5.4
Community	1421	12.6
Foundation	855	18.9
Voluntary-controlled	80	20.4
Voluntary-aided	511	21.3
City Technical College	3	34.3

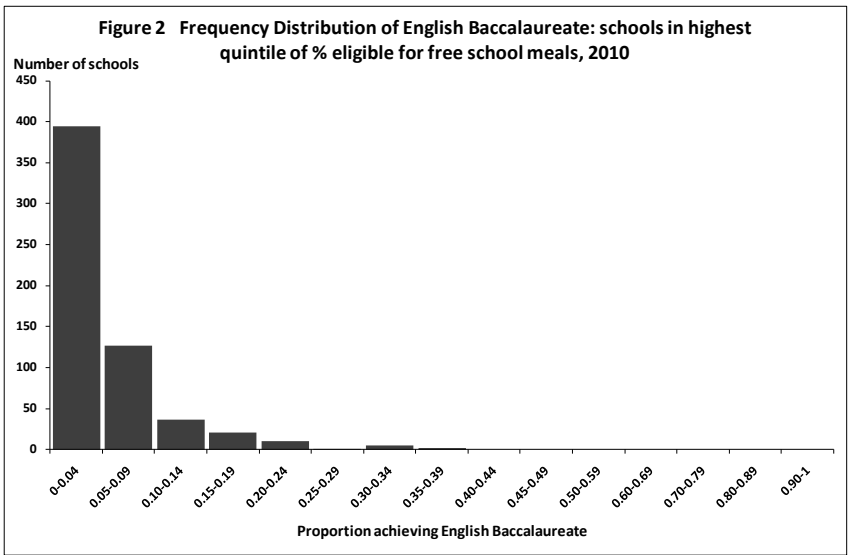
Note: Schools defined as 'modern' exist primarily in districts in which there are selective (i.e. grammar) schools and hence are not comprehensive since their intake of pupils is primarily determined by the selection of the academically most able pupils exercised by grammar schools. Source *of data*: Secondary School Performance Tables, Department for Education.

TABLE 3 Percent achieving the English Baccalaureate: by pupil characteristics

Quintiles	% achieving the English Baccalaureate
% pupils with special needs	
Lowest quintile	32.9
Second quintile	17.1
Third quintile	13.2
Fourth quintile	9.3
Highest quintile	5.5
% pupils eligible for free school meals	
Lowest quintile	36.5
Second quintile	18.1
Third quintile	11.1
Fourth quintile	7.3
Highest quintile	5.5

Source of data: Schools' Census and Secondary School Performance Tables, Department for Education.





Source of data: Schools' Census and Secondary School Performance Tables, Department for Education.

A further problem with the E-Bacc is that it tells us nothing about the *progress* made by pupils during their secondary schooling. This is a problem common to all three performance indicators based on the % of pupils achieving five or more A*-C grades. These indicators tell us virtually nothing about the *performance* of schools. They say far more about the prior attainment and family background of a school's pupils than they do about how the school itself is performing. This is why all indicators based on raw exam scores are so remarkably stable over time (see appendix, section 2). There is little that a school can do to improve its position in the Performance Tables based on raw exam scores since this would mean radically changing the prior attainment and family background of its annual intake of pupils.

This is not the case with the CVA indicator, which was designed specifically to control for the prior attainment and family background of its pupils in order to compare like with like.[2] *In other words, schools have more influence over their CVA indicator than they do over their raw exam scores.* It is therefore not surprising to find virtually no correlation between the E-Bacc indicator (based on raw exam scores) and the CVA indicator (see statistical appendix, section 3). An example of the inaccuracy in the measurement of performance based on the E-Bacc score is provided in Table 4, which shows that although schools specialising in business studies have a very low E-Bacc score, they have a higher CVA score than all other specialist schools. Thus, according to the CVA score, pupils in schools specialising in business studies make more progress during their secondary schooling than do pupils in language schools.

TABLE 4 Exam performance indicators, 2010: by school specialism

	Number of schools	% achieving 5 or more A*-C GCSE grades (or equivalent)	% 5 or more A*-C GCSE grades including English & maths	% achieving the English Baccalaureate	Contextual value added
No specialism	305	73.7	42.7	6.0	1005
Business & Enterprise	266	77.5	53.1	10.8	1004
Sport	364	76.6	51.5	11.3	1001
Engineering	68	77.3	55.6	13.7	998
Arts	474	75.9	54.3	14.0	1000
Technology	503	77.8	57.7	14.8	1001
Maths & Computing	295	78.7	59.1	16.5	1002
Humanities	152	77.0	58.6	19.6	1001
Science	352	79.7	62.7	22.5	1000
Languages	222	82.8	67.8	30.9	1002
Music	31	82.9	70.0	33.5	1003

Notes:
1. Schools with more than one specialism are classified in the subject in which they initially obtained a specialism.
2. The English Baccalaureate is as follows: English, maths, two sciences, history or geography, and a foreign language.
3. The Contextual Value Added (CVA) measure is based on the progress made by pupils between Key Stages 2 and 4. See http://www.education.gov.uk/performancetables/schools_08/s3.shtml for a detailed explanation of how CVA is calculated.
Source of data: Secondary School Performance Tables, Department for Education.

The bias in the E-Bacc measure is also evident in regional disparities in school performance. Table 5 shows the average scores for four performance indicators by region; Table 6 ranks regions according to each indicator. Using the CVA indicator, the North achieves top rank but is ranked bottom in terms of the E-Bacc. In contrast, the East, the South East and the South West are ranked low on the CVA indicator but high on the E-Bacc. Adopting the E-Bacc as a performance measure would clearly favour schools located in the south.

[2] See http://www.education.gov.uk/performancetables/schools_08/s3.shtml for a detailed explanation of how CVA is calculated.

TABLE 5 School performance indicators by region

Region	Number of schools	Contextual value added	% achieving 5 or more A*-C GCSE grades (or equivalent)	% 5 or more A*-C GCSE grades including English & maths	% achieving the English Baccalaureate
London	410	1008	79.2	59.1	17.6
South East	471	999	77.2	58.4	20.0
South West	295	996	74.0	56.3	17.4
East	329	997	75.1	57.0	17.7
East Midlands	248	998	76.0	53.9	13.8
West Midlands	368	1005	79.7	55.6	14.0
Yorkshire and Humberside	303	1000	77.3	51.9	12.0
North West	454	1002	78.9	55.8	13.3
North	153	1010	81.4	52.8	10.0

Source of data: Secondary School Performance Tables, Department for Education.

TABLE 6 Rank order of regions for each performance indicator

Region	Contextual value added	% achieving 5 or more A*-C GCSE grades (or equivalent)	% 5 or more A*-C GCSE grades including English & maths	% achieving the English Baccalaureate
North	1	1	8	9
London	2	3	1	3
West Midlands	3	2	6	5
North West	4	4	5	7
Yorkshire and Humberside	5	5	9	8
South East	6	6	2	1
East Midlands	7	7	7	6
East	8	8	3	2
South West	9	9	4	4

Do we really need an English Baccalaureate?

Views about the future status and usefulness of the English Baccalaureate vary. The Specialist Schools and Academies Trust (SSAT), for example, is generally supportive but has expressed some concern about its usefulness as a performance measure if widely used for all schools. The SSAT was integrally involved with the development and operation of the specialist schools policy (introduced by the Conservative Government in 1992 and continued throughout the Labour Government's period of office). Schools were encouraged to play to their strengths by delineating a specialism in which it was expected to excel. The two primary aims of this specialist schools policy were, first, to provide pupils with greater choice (between schools with different specialisms); and second, to raise the quality of teaching throughout the school by using the success achieved in the specialist subject as a benchmark for all other subjects in the school.

One of the specialisms was, of course, foreign languages, but less than 8% of schools actually chose to be a specialist in languages. The focus of attention in the vast majority of schools therefore shifted away from languages, with the consequence that the proportion of pupils studying a modern language at GCSE fell dramatically from 79% in 2000 to just 44% in 2009 (Department of Education 2010a, p.44). The SSAT is now concerned that the introduction of the E-Bacc to encourage the reinstatement of foreign languages in the core curriculum may have adverse effects in some areas of school specialisation. It consequently suggests that "further work should be carried out with school leaders to ensure that the E-Bacc leaves the space and flexibility in the curriculum needed for schools to provide an imaginative and creative offer to their students" (SSAT 2010).

But this response by the SSAT does not face up to the key question raised earlier: why do we need to encourage all pupils (through the introduction of the E-Bacc as a performance indicator) to study a foreign language between 11 and 16? It is not clear why studying French (or German or Spanish) is a necessary condition for understanding cultural differences, especially in a society that is already multicultural. Foreigners do not study English in order to gain a better understanding of life in the UK. They study English because it happens to be used extensively in more countries than any other language, thanks primarily to the economic, political and cultural dominance of the USA. It is also unclear why studying a foreign language is more valuable to pupils than studying other subjects excluded from the E-Bacc such as business studies, technology, music and drama. Achieving a high grade in business studies, for example, may be far more valuable to a pupil with an interest in business enterprise than a low grade in a foreign language.

There is obviously a great need across the world to learn the English language since it happens to be the dominant language used for communication between people of different nations. There is therefore no great need for all pupils of secondary school age in the rest of the world to study any foreign language other than English. So why is there such a need for an increase in the number of secondary school pupils to study a foreign language in Britain? Would studying French up to the age of 16 (the most popular foreign language taught in Britain's schools) provide pupils with a more "properly rounded academic education" than any other minority subject (Department of Education 2010a, p.44)?

Proposal

Since it is clear that the English Baccalaureate suffers from serious bias, and since there is no consensus about the value of imposing the teaching of languages on unwilling secondary school pupils (no matter how personally satisfying it would be to have more than one language in one's portfolio of personal skills), common sense suggests that *the E-Bacc should not be included in the School Performance Tables*.

An alternative approach to measuring a school's performance would be to supplement a school's CVA score with a measure that would be more clearly understood by parents. For each school, a benchmark would be provided against which the actual GCSE outcome could be compared. The benchmark would simply be the

% of pupils that *would be expected to achieve five or more A*-C grades (including English, maths and science) given each pupil's prior attainment and given a range of family background variables.* Benchmarking is much easier to understand and despite its drawbacks would be far more valuable, especially to parents, than any of the existing indicators. The CVA score could be retained to provide an *overall* measure of a school's performance since it is based on the progress made by *all* pupils and not just those who are capable of achieving the benchmark score.

References

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Department for Education, 2010b *Statement of Intent 2010 –Addendum (the English Baccalaureate)*, December 2010.

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Statistical appendix

1. Regression analysis of three performance indicators

A more rigorous method of identifying the variables that are correlated with a school performance indicator is to construct a multiple regression model. The advantage of multiple regression analysis is that the statistical relationship between each performance indicator and a wide range of potentially related variables can be measured *simultaneously*. In estimating the relationship between a performance indicator and a variable such as the proportion of pupils eligible for free school meals, for example, it is therefore possible to control for a wide range of other variables that may also be correlated with the performance indicator.

Main findings

The results of the regression analysis are presented in Table A below. All continuous variables are transformed into standard normal variables so that the estimated coefficients are easily compared across the range of explanatory variables.

The overall explanatory power of the regression model for the English Baccalaureate is high. Nearly three quarters of the variation in performance between schools is accounted for by the variables included in the model. The regression estimates for the E-Bacc indicate that certain types of school are far more likely to achieve the E-Bacc than others. There is a strong bias in achievement in the E-Bacc in favour of schools with the following characteristics:

- Schools specialising in languages (no surprise here)
- Grammar schools (again, not surprisingly)
- Voluntary-aided schools (faith schools)
- Girls-only schools
- Larger schools
- Schools with a low pupil / teacher ratio
- Schools with a low % of pupils eligible for free school meals
- Schools with a low % of pupils with special educational needs

These results are consistent with the information provided in Tables 1 to 3.

TABLE A Estimated regression equations: three school performance indicators

Regressors	% achieving the English Baccalaureate
Arts	-0.030
	(0.052)
Business & Enterprise	-0.092
	(0.056)
Engineering	-0.237***
	(0.074)
Humanities	0.031
	(0.066)
Languages	0.294***
	(0.067)
Maths & Computing	-0.104
	(0.057)
Music	0.240
	(0.134)
Science	0.034
	(0.058)
Sport	-0.104
	(0.054)
Technology	-0.075
	(0.054)
Modern school	0.010
	(0.078)
Grammar school	2.566***
	(0.114)
Academy	-0.009
	(0.061)
CTC	0.910
	(0.755)
Foundation school	0.063*
	(0.029)
Voluntary-aided school	0.138***
	(0.036)
Voluntary-controlled school	0.050
	(0.069)
Age range: 11-18 school	-0.077*
	(0.030)
Boys-only school	0.106
	(0.063)
Girls-only school	0.381***
	(0.056)
Size: number of pupils	0.115***
	(0.016)
Pupil/teacher ratio	-0.055***
	(0.017)
% eligible for FSM	-0.329***
	(0.024)
% pupils white	-0.063
	(0.040)
% pupils with special needs (not 'statemented')	-0.109***
	(0.014)
% pupils with special needs ('statemented')	0.006
	(0.012)
% English second language	0.011
	(0.033)
Constant	-0.148
	(0.053)
R-squared	0.72
n	2805

Notes to table: ( ) = robust standard errors. * = significant at 0.05, ** = significant at 0.01, *** = significant at 0.001. Each regression includes a dummy variable for the 321 local authority districts. The base group is as follows: non-specialist school, comprehensive school, community school, age range up to 16, mixed gender school. All continuous

variables are in standard normal form (including the dependent variables) with a mean of zero and a standard deviation of one.
Source of data: Schools' Census (LEASIS) and Secondary School Performance Tables, Department for Education.

2. Correlation of individual performance indicators over time

Performance indicators based on raw exam scores, such as the % of pupils achieving 5 or more A*-C grades (including English and maths), are remarkably stable over time, thus implying little change in the overall ranking of schools in the Performance Tables from one year to the next. This is evident from Table B, which shows a high level of correlation over time in the raw exam scores indicator. By contrast, the CVA performance indicator is very unstable over time. The correlation matrix shown in Table C shows a sharp fall in the correlation between the CVA indicator for different years as the gap in years widens.

The stability of the raw exam scores over time is not surprising since the raw exam score obtained by a school is largely determined by the prior achievement and family background of its pupils, both of which are very stable over the medium term.

TABLE B Correlation matrix for the performance indicator based on the % of pupils with 5 or more A*-C grades (including English and maths)

	2006	2007	2008	2009	2010
2006	1				
2007	0.90	1			
2008	0.86	0.88	1		
2009	0.85	0.86	0.86	1	
2010	0.79	0.83	0.83	0.85	1

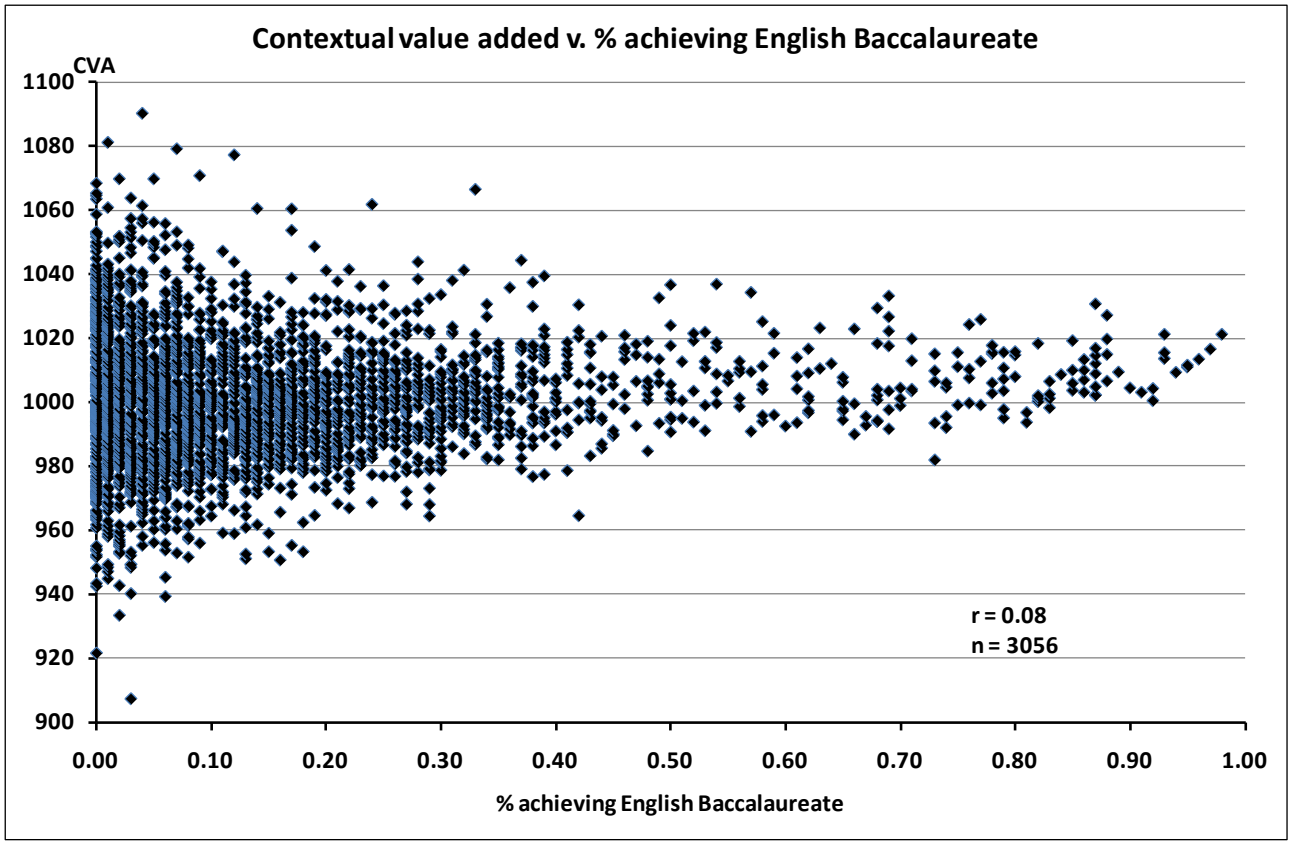
TABLE C Correlation matrix for performance indicator based on a school's Contextual Value Added Score

	2006	2007	2008	2009	2010
2006	1				
2007	0.53	1			
2008	0.29	0.50	1		
2009	0.18	0.32	0.55	1	
2010	0.09	0.18	0.34	0.55	1

Note: These tables contain the coefficient of determination (i.e. the square of the correlation coefficient) in order to show the % of variation between schools in the selected performance indicator for any single year 'explained' by a previous year's results. Thus, for the indicator based on the % of pupils with 5 or more A*-C grades, 79% of the variation between schools in 2010 can be 'explained' (statistically) by the 2006 results. In contrast to this, only 9% of the variation in the 2010 CVA results is 'explained' by the 2006 CVA results.

3. Correlation between Contextual Value Added and the % achieving the English Baccalaureate

The following scatter diagram shows that the correlation between the CVA measure of school performance and the E-Bacc measure is very low (r = 0.08).



Source of data: Secondary School Performance Tables, Department for Education.