Department for Education

Statistical Working Paper

Measuring the performance of schools within academy chains and local authorities

Working Paper Summary

Background

Since the Academies Act 2010, the schools system in England has evolved rapidly. From that point over 4,000 schools have moved from local authority control to become converter or sponsored academies. In addition, new provision academies, free schools, university technical colleges and studio schools have been established. Today there are 2,109 secondary academies and 2,569 primary academies.[1]

As the academy sector has grown, academies and free schools are increasingly organised in formal collaborative arrangements often referred to as academy chains – over half are in such arrangements.

However, academies and academy chains are just one part of the school system and, whilst there has been rapid growth in their number, the majority of state-funded schools remain local authority schools - 1,272 secondary schools and 14,196 primary schools.

Assessing the progress being made by chains and local authorities

Clearly both local authorities and academy chains play a critically important role in the schools system and it is right that we consider the impact that each are having. Of course this can be considered with reference to the progress being made within individual schools - there

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[1] Including free schools, university technical colleges and studio schools. These figures exclude special and alternative provision academies and free schools.

is already a wide range of data available at school level through the school performance tables.

At present, however, we do not publish a summary of performance at academy chain or local authority level. Doing so poses a challenge. Simple aggregations of attainment or other measures can lead to spurious conclusions about performance within a chain or local authority since they will often reflect the type of schools that have entered into the chain relationship or that remain with a local authority.

However, an effective summary, if achievable, could have many benefits – making assessment of progress simpler, enabling chains and local authorities to understand their own relative performance, helping parents when making choices about schooling and informing decision making by the department.

This paper explores how we might achieve this fairly and proposes a combination of two new measures of performance at key stage 4, but with the potential to be extended to key stage 2, which could contribute to an assessment of the performance of a chain or local authority. These measures would seek to capture two things:

1. how effectively schools within chains and within local authorities are currently performing; and

2. how that performance has changed over time.

Methodological considerations

It should be acknowledged that the overall performance of chains or local authorities has many dimensions including pupil outcomes, financial management, quality of leadership, value for money, workforce management and (for chains) capacity to expand. Performance can also be impacted by a number of contextual factors including, for example, start point and pupil make up.

Our first conclusion, therefore, is that no single measure is ever likely to capture every element of performance or impact. This should be borne in mind when considering the outcomes reported in this paper. It is also for this reason that we are providing extensive additional contextual data alongside these outputs.

Our second conclusion is that, as academy chains and local authorities have very different roles and responsibilities, they are not as a result directly comparable. So we would advise that academy chain results are only considered in relation to other academy chains, and similarly local authority results should only be compared with other authorities. The provisional data that we are publishing reflects this position.

Developing the new measures

There are strong arguments for using published data from the performance tables to underpin any new measure. It means that performance at chain and local authority level is directly linked with measures of accountability at school level. Yet simple aggregations of existing measures, such as the proportion of pupils within a chain or local authority who achieved five good GCSEs, risk giving a misleading account of the performance of the chain or local

authority as a whole. They may, for example, merely reflect that the chain has recently taken over poorly performing schools. Similarly a local authority may see low results because all of its high performing schools have become converter academies. Such situations could also introduce perverse incentives into the system that would drive undesirable behaviours. For example, high performing sponsors might be reluctant to take on more challenging schools if they feel this will be reflected in measures as poorer performance.

We wanted, therefore, to develop measures which would avoid these potential pitfalls – demonstrating both current performance and improvement over time, taking into account start point and showing relative progress.

Current performance

The first measure captures the current performance within academy chains and local authorities by taking an average of the current value added in each relevant school. Value added is an estimate of school effectiveness and measures the performance of pupils in comparison to pupils with similar prior attainment nationally. In calculating the overall score, a weighting is applied based on both the size of the school (i.e. pupil numbers) and on how long the school has been part of the chain or local authority in question.

This measure can be considered to be an attempt to answer the question:

How much progress are the pupils in this chain or local authority currently making in comparison to average (based on pupils with similar prior attainment nationally)?

This measure will recognise those chains and local authorities that have historically driven improvements in performance that are now maintaining that higher level. It also means that the performance of new schools that do not have historic performance data is also recognised.

Relative improvement over time

The second measure captures the relative improvement in the performance of the schools in a chain or local authority over time. It examines changes in value added measures across years in comparison to schools with a similar starting point. The performance of each school is compared to other schools that started, in terms of value added, at a similar level of effectiveness. This is then aggregated to academy chain or local authority level to get a measure of the overall level of improvement of schools within each organisation. Again, in calculating this aggregation, a weighting is applied for both school size and length of time in the chain / local authority.

This measure can be considered to be an attempt to answer the question:

How much has the effectiveness of the schools in this chain improved compared to schools with a similar starting point?

Strengths and weaknesses

As well as setting out the arguments in favour of these measures, this paper discusses some of the inherent weaknesses. We believe value added provides a fairer comparison than simple aggregates of attainment since it controls for pupil intakes. However, measures of value added are estimates with a degree of uncertainty which should be recognised in any measures

derived from them, particularly when looking at changes over time. The nature of value added means that two schools with the same score can have very different characteristics which may affect rates of improvement. To aid interpretation of the scores we are including additional contextual information, including number of schools included in the measures, the types of school and the average levels of disadvantage, special educational needs and prior attainment.

No measure can fully capture the range of individual circumstances in every school, academy chain or local authority or the full breadth of their activity. Similarly, the measures are based on data that is currently available. As the performance tables evolve these measures will also evolve (for example with the introduction of new progress 8 measures).

The results

The outputs using our new methodology are published alongside this paper. However, as the product of a new methodology that requires testing, they should be approached with some caution. Readers should note in particular the weaknesses acknowledged above and within the paper.

We are providing scores at key stage 4 for both local authorities and academy chains. This is based on value added between key stage 2 and key stage 4 and is presented in two separate scores based on 'best 8' measures that include and exclude equivalent qualifications. It is our intention to calculate equivalent statistics at key stage 2 once the principles of the measure have been established. Therefore this paper also includes some discussion of issues that are specific to performance of primary schools.

The results are based on school level data published in DfE performance tables (or derived from underlying pupil data). In line with the approach used in performance tables, school level performance data is only attributed to an academy chain if it had joined that chain no later than September 2013. We are also only providing an aggregate score where a chain or local authority has five or more schools with results at key stage 4. Therefore, the results do not take into account any very recent changes to a chain or local authority e.g. a school joining an academy chain post-September 2013.

The methodology presented in this statistical working paper provides a summary of performance within chains and local authorities across all pupils. There is the potential to develop the methodology further so that the performance of different groups – such as disadvantaged pupils or those with low prior attainment – can be explored. The department will consider how this might be achieved.

Next steps

We believe that these new measures provide a useful base from which to raise the debate around the performance of schools within academy chains and local authorities.

At this stage we have made no decisions about whether to adopt these measures or how they might be used within formal decision making. The paper invites comment on these issues. As stated above, we acknowledge that these measures cannot themselves capture the entirety of the achievements of an academy chain or local authority.

The department invites users to provide views on the working methodology, its application and any suggestions for alternative approaches. Please direct all comments and queries to the following email address: infrastructure.statistics@education.gsi.gov.uk

In particular we would welcome any views on:

Section 1: Background

- Do you believe that performance information at academy chain and local authority level should be published?
- Do you agree that the performance of schools within academy chains and schools within local authorities should be presented separately?

Section 2: What constitutes an academy chain or local authority in this context?

- Do you agree with the schools that are included within the definition of a local authority?
- Do you agree with this definition of an academy chain?
- Do you agree with the threshold of five schools or is another threshold more appropriate?

Section 3: Methodology development

- Do you believe that value added provides a fair basis for comparing academy chains and comparing local authorities?
- Do you believe that measures of attainment (such as the EBacc) should be considered instead of, or alongside, measures of value added?
- Do you agree with the proposal to have two measures, one measuring the current performance of schools and one measuring their improvement over time, or is a wider set of indicators required?
- Do you believe that grouping schools by previous value added outcomes is fair or do you prefer another approach?
- Do you believe that the approach to the construction of comparator groups provides meaningful comparisons and what further data (if any) should be considered when constructing comparator groups?

Section 4: Working methodology

- Do you agree with the approach to 'current value added' i.e. a weighted average of school level value added scores?
- Do you agree with the approach to calculating a standardised improvement score for schools? That is:
  - calculating a baseline score using a three year average where possible;
  - calculating the improvement between this score and the current (one year) value added;
  - comparing this improvement with the average of improvements within a comparison group;
  - standardising this score by dividing by the spread (standard deviation) of school scores within the comparison group?
- Do you agree that schools should be weighted by length of time open so that longer established schools contribute more to academy chains and local authorities?
- Is the approach to putting scores back on a 'real world' scale appropriate?

- Do the confidence intervals adequately address the level of uncertainty in each of the measures?

Section 5: Known issues and mitigation

- Given the relative nature of value added, do you believe that it is sufficiently comparable over time for this purpose?
- Is using the current value added of a school sufficient or should this be averaged over several years (at the expense of losing a number of schools from the measure)?
- Do you believe that the approach of creating comparator groups provides meaningful comparisons?
- Academy results are only included within a chain's score if they have been part of that chain for at least one academic year. Do you favour a different inclusion point?
- How should we reflect the fact that not all schools have results?
- Could key stage 1 to 2 value added be used to develop similar performance measures for primary? If not, then are there alternatives you suggest we consider?
- What further breakdowns of the measures would you like to see?

Section 6: Presentation and interpretation

- Are the proposed contextual data useful, what else should be considered?
- Are the proposed measures easy to interpret?

In developing this new methodology, the department consulted with members of its School Performance Measures Methodology Advisory Group, members of its Local Authority Reference Group, Ofsted and a small number of individual academy chain bodies. We are very grateful for their time and input.

Contents

1. Background: why is the department measuring the performance of schools within chains and local authorities?

There are just over 20,000 state-funded mainstream schools in England with a variety of governance arrangements.

Academies are independent state schools that are directly funded by the government. The Academies Act 2010 has led to a substantial increase in their number and over half of state-funded secondary schools are now academies.

There are a number of different types of academies. Sponsored academies generally replaced previously underperforming schools, while converter academies are generally higher performing schools that have chosen to convert. The term "academy" also covers free schools, university technical colleges and studio schools.

Over half of academies are in formal collaborative arrangements - in what are commonly referred to as academy chains with the aim of sharing expertise, providing challenge and improving standards. But academies are just part of the school system and, whilst there has been rapid growth in their number, the majority of state-funded schools remain local authority schools (community, voluntary aided, voluntary controlled and foundation schools).

To date there has been no systematic approach to comparing the performance of these organisations within this new system. As the school sector changes there is a growing need to be able to evidence the impact that academy chains and local authorities have on school performance, taken both in aggregate and relative to each other.

An effective summary, if achievable, could have many benefits – including making assessment of progress simpler, enabling chains and local authorities to understand their own relative performance, helping parents when making choices about schooling and informing decision making by the department. In addition, in the recent report on academies and free schools, the Education Select Committee recommended that the department should publish performance information on a chain-by-chain basis.[2]

Academy chains and local authorities have very different roles and responsibilities and, as a result, they are not directly comparable. Therefore, this paper proposes that academy chain results are only considered in relation to other academy chains, and similarly local authority results should only be compared with other authorities.

Questions

- Do you believe that performance information at academy chain and local authority level should be published?
- Do you agree that the performance of schools within academy chains and schools within local authorities should be presented separately?

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[2] "Education - Fourth Report: Academies and Free Schools"
http://www.publications.parliament.uk/pa/cm201415/cmselect/cmeduc/258/25802.htm

2. Background: what constitutes an academy chain or local authority in this context?

The structures in which academies operate mean that there are a number of ways in which the term 'chain' could be defined. Similarly the role of local authorities varies in different types of schools defined as 'local authority maintained'.

Each academy is part of an underlined academy trust which is an exempt charity and company limited by guarantee. Every academy trust enters into a funding agreement with the Secretary of State for Education that sets out the requirements that apply to individual academies and the conditions to which the payment of grant is subject.

There are two types of academy trust:

- ▪ Single Academy Trust (SAT) - A single academy trust runs one academy and is governed by a single set of articles and a funding agreement between the academy trust and the Secretary of State; and

- ▪ Multi Academy Trust (MAT) – Multi-academy trusts usually run more than one academy. The MAT has a single set of articles and therefore is a single legal entity accountable for a number of academies. The trust enters into a Master Funding Agreement (MFA) with the Secretary of State, and into Supplemental Funding Agreements (SFA) for each academy it operates.

An approved sponsor is a body that has been approved by the Department to take on underperforming schools. Such a sponsor may choose to establish separate trusts for the academies for which they are responsible, or have just one MAT to run all of their academies.

Whilst many schools are now academies, the majority of state-funded schools remain fully or partially under local authority control. These include community schools, foundation schools, voluntary aided school and voluntary controlled schools.

For the purposes of these new performance measures:

A local authority (LA) is a group of five or more schools that are community, voluntary aided, voluntary controlled or foundation schools.

These schools are fully or partially under LA control and are state-funded, mainly by the Dedicated Schools Grant.

An academy chain is a group of five or more academies in either:

- A 'sponsor-led' chain comprising five or more academies linked to the same approved sponsor. There may be a number of different trust arrangements in place – a sponsor's linked academies may all be in SATs, may all be in MATs, or may be a combination of SATs and MATs. Many converter academies are recorded as being in sponsor-led chains, but are not in themselves 'sponsored'. These converters will have voluntarily joined academy trusts that are led by 'approved' sponsors.

or

- A 'non-sponsor led' chain comprising five or more academies in a MAT.

The term 'linked' in this context usually means that:

(a) the academy sponsor is listed as the 'principal sponsor', 'lead sponsor' or 'sponsor' in section 1 ('Interpretations') of the articles of association; or

(b) the name of the trust/ company's name in the articles in section 2 of the articles is the name of the academy sponsor; or

(c) the academy sponsor has majority influence on an academy trust: either as a founding member of the academy trust (in the memorandum of association); or as subsequently appointed members in section 12 of the articles.

There are two exceptions:

- There are cases where sponsors that are diocese or diocesan bodies are linked through (c) but not 'linked' through either (a) or (b). In these cases, being linked through (c) is <u>not</u> sufficient for converter academies to be listed as part of the dioceses' sponsor-led chain. This is because diocese are listed as founding members/ members in order to replicate the diocese influence in the governance of the predecessor school, and not to indicate accountability for the academy.

- There are cases where we will record an academy as linked to an academy sponsor but there is no 'link' recorded as at (a), (b) or (c) above. In these cases, an academy will be considered to be in that sponsor's chain where the Department has confirmation that the academy trust and the academy sponsor both agree that they are formally associated with each other.

Results are presented for chains and local authorities with at least five schools that had results at key stage 4. We have chosen to use this threshold as this focuses on larger groups who typically are more established in their roles. It also means that the results for a group are less likely to be disproportionately affected by the results of one school.

Results for all individual schools continue, of course, to be available in the school performance tables.[3]

Questions

- Do you agree with the schools that are included within the definition of a local authority?
- Do you agree with this definition of an academy chain?
- Do you agree with the threshold of five schools or is another threshold more appropriate?

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[3] DfE (2015): *School Performance Tables*
http://www.education.gov.uk/schools/performance

3. Methodology development: rationale for the proposed new measures

This working paper proposes two measures that capture how schools within chains and within local authorities are currently performing and how that performance has changed over time.

In developing these measures, key principles have been used to assess their suitability. Measures should:

- demonstrate a link between the performance of individual schools within a chain or local authority and the overall measure and, in as far as is possible, be consistent with measures in performance tables;

- avoid obvious unfairness and not introduce perverse incentives (e.g. in being biased against local authorities where all the highest performing schools have converted or act as a disincentive to sponsors taking on the most challenging schools); and

- demonstrate not only how well a chain or local authority's schools are performing now, but also improvement over time.

This section sets out possible approaches and demonstrates the extent to which the proposed measures would meet these principles.

Measures of average attainment

The simplest approach is to produce an aggregation of established attainment measures such as the proportion of pupils who achieved five good GCSEs including English and mathematics. Such measures are readily understood by users and map well to the standards that are (currently) used to assess performance at school level.

However, taken in aggregate in an evolving schools system, they can be a poor measure of the effectiveness of chains and local authorities. Such measures can often reflect the type of schools that have joined a chain (or remain with the local authority) rather than the performance of that chain or local authority itself. For example, a chain with a number of schools that have recently become sponsored academies is likely to have much lower attainment on average than a chain with a mix of well-established sponsored and converter academies. Similarly, use of such measures in isolation could act as a disincentive to sponsors to take on schools which might lower their overall attainment.

More generally, measures of attainment do not account for the pupil intake of a school. A school may be highly effective in terms of the progress that pupils make but still have attainment that is relatively low.

Measures of change in attainment

One way to address the problems associated with average attainment is to look instead at changes in attainment. This would mean that a chain or local authority would not be assessed by the overall current performance of its schools, but by the extent to which their results have improved. For example, improvement in attainment could be assessed by comparing a

school's performance (measured by 5+ A*-C GCSE including English and mathematics) to its performance five years previously (or, a shorter period if they had been open for less time).

This is often a very useful measure. It enables users to see whether underperforming schools or groups of schools are catching up with higher performing schools. However, the extent to which a school improves is related to its starting point. Schools with the lowest previous outcomes tend to see the largest improvements. This is illustrated in *figure 3.1* below. Schools are grouped by their attainment in 2013 and the average improvement between 2013 and 2014 is plotted. Schools with the lowest attainment in 2013 tended to see the largest increases and conversely those at the higher end tended to see falls. Therefore, a measure based on improvement alone may not be fair since one chain or local authority might have a different mix of schools to another and a measure based on change in attainment would be affected by this.

Figure 3.1: Change in the proportion of pupils that achieved 5+ A*-C including English and mathematics between 2013 and 2014[4]
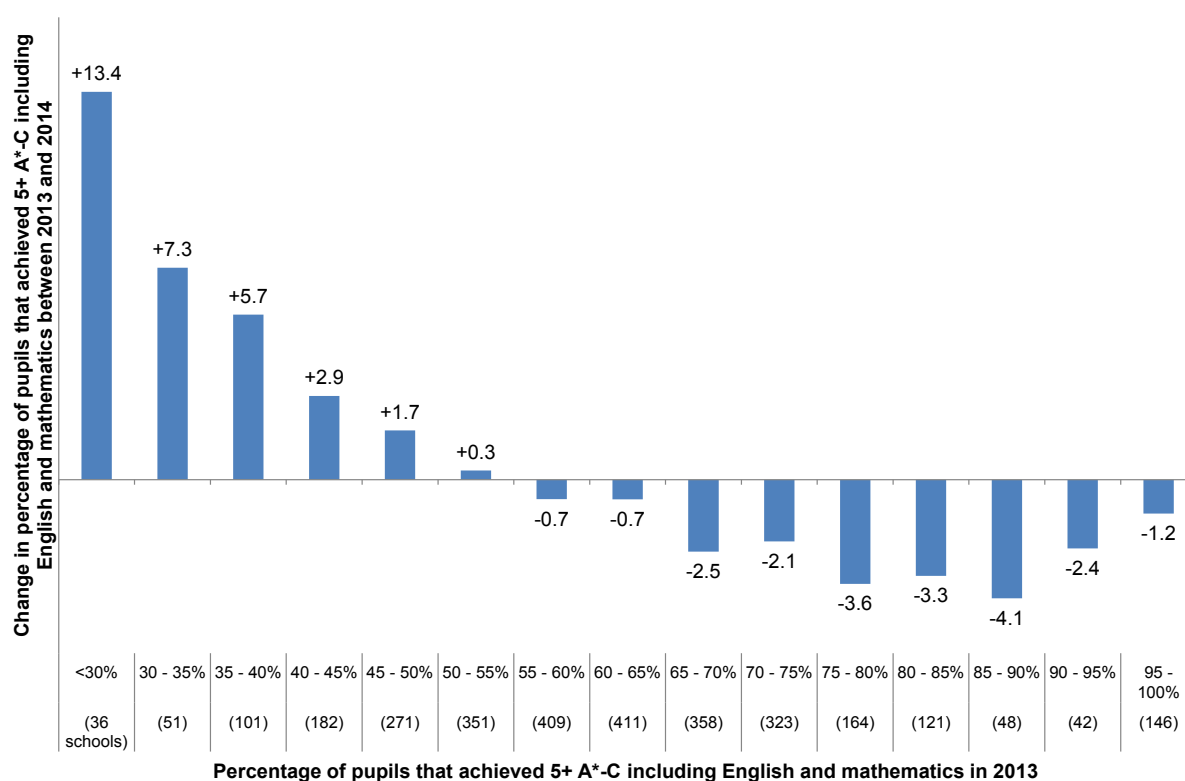
The department has attempted to control for this effect in the past when assessing the performance of sponsored academies using a technique known as propensity score matching.[5] Using this method, each sponsored academy was matched to a similar local authority school

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[4] There are a number of changes to key stage 4 performance measures in 2014. The changes presented here are based on applying the 2013 methodology to 2014 data. For further information on how reforms affect performance measures see:
DfE (2015): *"Revised GCSE and equivalent results in England: 2013 to 2014"*
https://www.gov.uk/government/statistics/revised-gcse-and-equivalent-results-in-england-2013-to-2014
[5] DfE(2012): *"Attainment at Key Stage 4 by pupils in academies"*
https://www.gov.uk/government/publications/attainment-at-key-stage-4-by-pupils-in-academies-2011

which, based on previous outcomes, prior attainment and deprivation, had a similar propensity to become a sponsored academy but had not yet done so. The group of sponsored academies was then compared to this group of similar local authority schools.

Adopting a similar approach for measures of chain and local authority scores is not practical since it would be based on a small number of schools in each group (as it would require a model that calculates the propensity of being in a particular chain or local authority). Additional complexity is introduced by the fact that schools may have joined a chain or local authority at a range of points in time.

Measures of change in attainment in comparison to schools with a similar starting point

A simpler approach would be to compare the progress made by a school to that of all schools with the same (or very similar) starting point in terms of attainment.

Whilst this approach provides a way of comparing changes in attainment between schools, it too has flaws since it does not account for the very different circumstances which may exist in two schools with the same level of attainment.

Measures based on grouping by one year of attainment data can be misleading since a school with sustained underperformance would be compared with one which may have just seen a dip in results in the previous year. This can be addressed by taking an average over several years.

Even allowing for this volatility, there remains a serious concern with comparing two schools with the same level of attainment. This is because in one, pupils might be far exceeding expectations given previous outcomes while, in the other, pupils might be making less progress than expected. The ability to demonstrate improvement is clearly going to be higher in the second school.

This is illustrated in *figure 3.2* below. Schools are grouped by key stage 4 attainment in 2012 and the distribution of key stage 2 average point scores is then plotted.[6] It is not surprising that the schools with the highest key stage 4 results tend to have the highest key stage 2 attainment on entry. For example, in schools where over 80% of pupils achieved five good GCSEs including English and mathematics, the average key stage 2 point score on entry was just over 29 compared with under 27 in schools where fewer than half of pupils achieve that standard.

Such 'between group' variation does not matter for an improvement measure since it would not directly compare schools that are in different groups. However, there remains considerable 'within group' variation. For example, in the group of schools in which 50-59% of pupils achieved five good GCSEs in 2012, the attainment on entry ranged from just under 26 points in some schools (the bottom of the bar) to just under 29 points in others. This range of 3

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[6] National curriculum point scores map directly to levels. Level 1 is worth 9 points, level 2 is worth 15 points and so on with each level being an additional 6 points. The average point score is the average of performance in reading, writing and mathematics. Hence a pupil who achieved level 4 in each of reading, writing and mathematics would have an average point score of 27 points.

points is equivalent to one year's progress during key stage 2. Therefore, while two schools may have the same level of attainment, their effectiveness (in terms of the progress pupils makes) can be very different. This will affect their propensity to demonstrate improvement.

Figure 3.2: Key stage 2 average point score on entry by key stage 4 attainment in state-funded mainstream schools
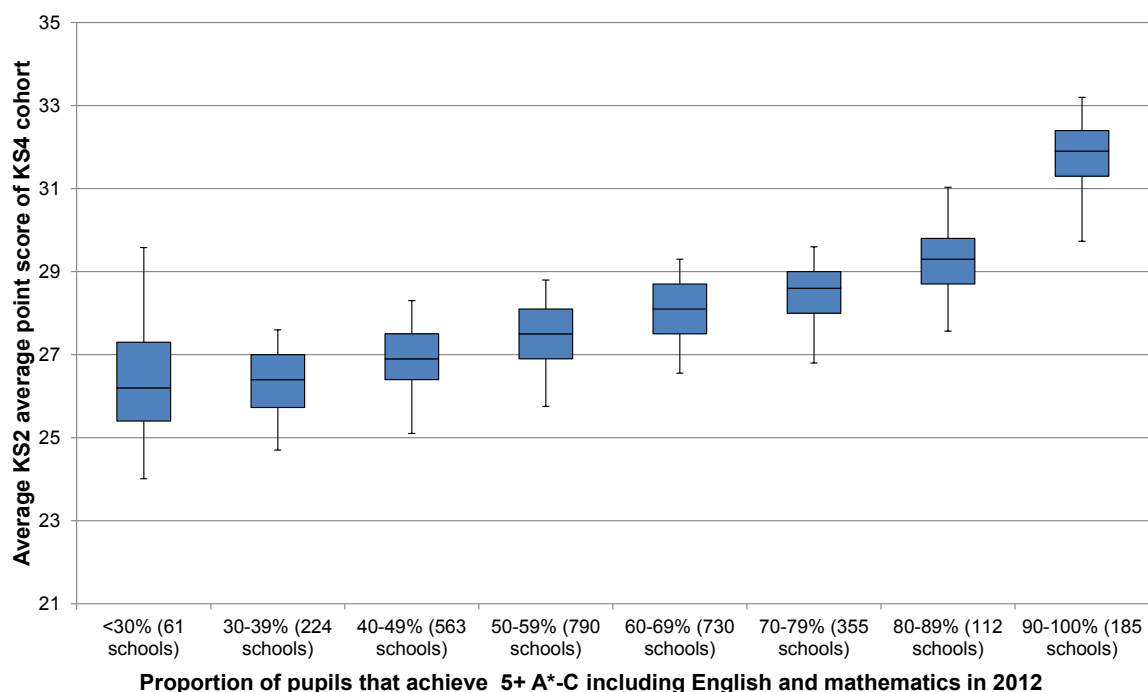
Note: Vertical bars represent 5th and 95th percentiles

Measuring current performance using value added

The analysis above demonstrates that the variation within groups of schools with similar levels of attainment weakens it as an approach to drawing comparisons between schools. To control for prior attainment, attainment can be replaced by value added. Value added is a measure of the performance of pupils relative to those with similar prior attainment nationally. An illustration of how value added is calculated at key stage 4 is given in *figure 3.3*.

Whilst there are various approaches to calculating value added, they generally share this same principle that attainment for a pupil is compared to pupils who are 'similar'. School scores are created by taking the average of all pupil scores. The resulting scores are an estimate of the effectiveness of a school and allow comparisons between schools with different intakes.

Figure 3.3: Illustration of a value added calculation
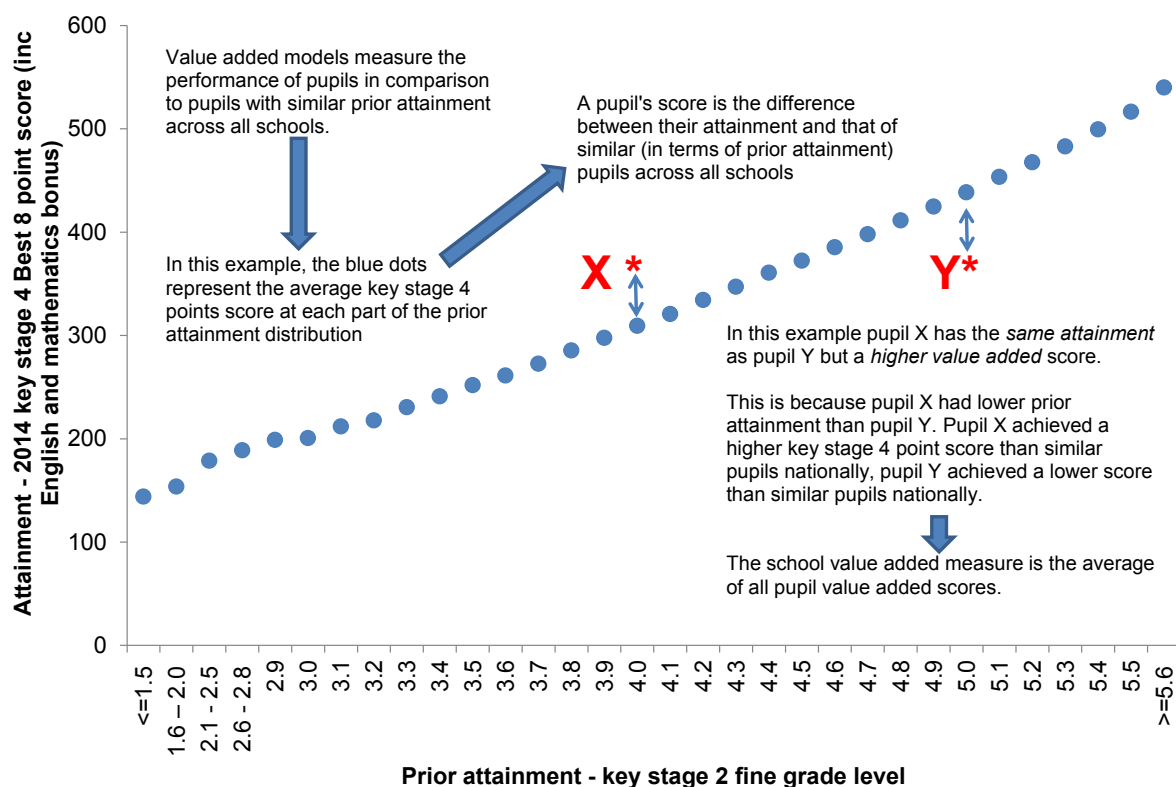
In secondary schools, value added is a measure of the progress of pupils between the end of key stage 2 and the end of key stage 4 (GCSE and equivalent qualifications). The measure is presented as a score centred around 1000. In schools with scores above 1000, pupils make more progress than similar pupils nationally and conversely scores below 1000 mean that pupils make less progress than similar pupils nationally. On this scale, 6 points represents one GCSE grade in one subject. Hence a score of 1006 means that pupils achieve one grade higher in one GCSE subject than similar pupils nationally.[7]

Such measures can be aggregated across an academy chain or a local authority to provide a summary of the current performance of schools, having allowed for the prior attainment of pupils attending those schools.

Measuring change in performance using value added

Using value added scores introduces a control for prior attainment (and so schools are 'similar') and so one approach to measuring improvement might be a simple change in value added score between years. As with attainment, however, the schools with the lowest value added have, on average, the largest improvements and conversely those with the highest start points see the largest falls over time.

Figure 3.4 groups schools by their value added score in 2010 and shows the change between 2010 and 2014. Schools with a value added score in 2010 that was below 964 saw improvements of around 24 points (broadly equivalent to an increase of four grades in one

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[7] Further information on the value added methodology and interpretation is available from the performance tables technical guidance: http://www.education.gov.uk/schools/performance/secondary_14/documents.html

subject). Schools with an initial value added of over 1039 saw falls equivalent to three grades in one subject.

Figure 3.4: Average change in key stage 2-4 'best 8' value added between 2010 and 2014 in state-funded mainstream schools
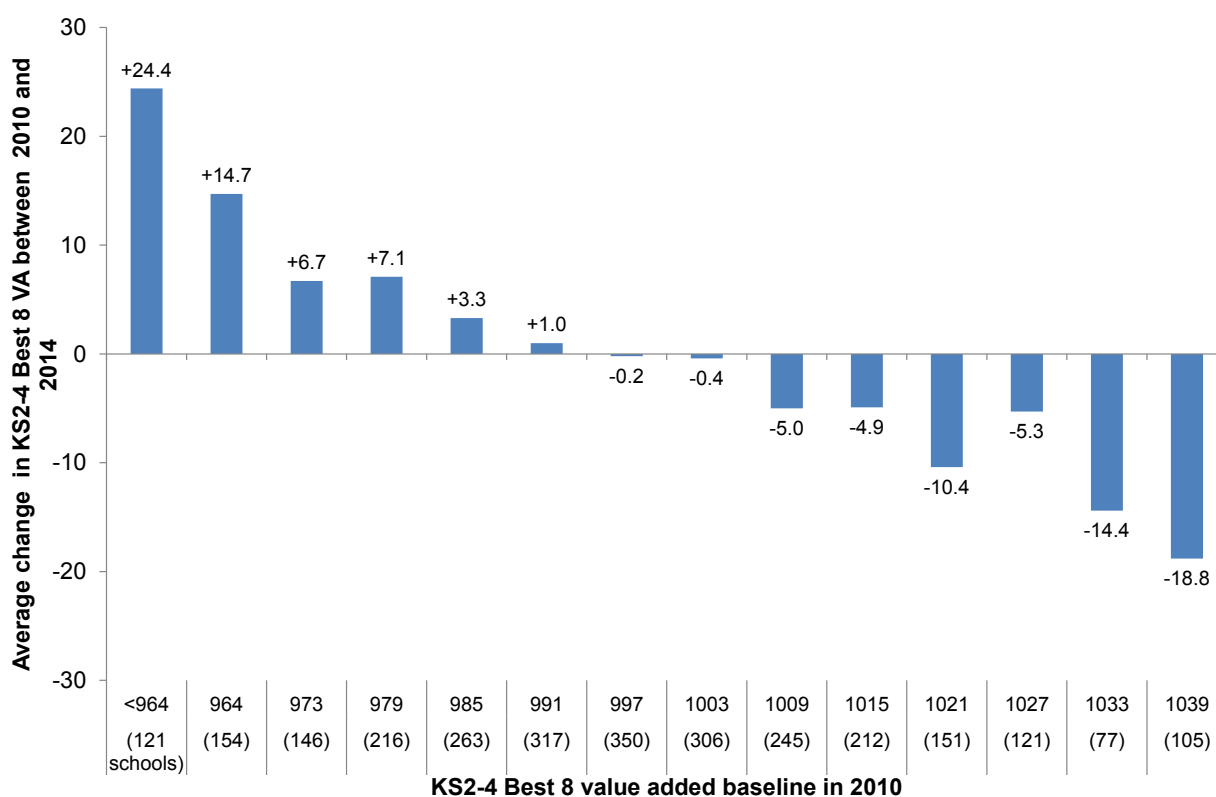
This means that an approach that uses a simple change in value added would bias results in favour of those schools with the lowest value added and by corollary favour those chains or local authorities with a large proportion of such schools.

The combination of these factors means that performance in terms of improvement in value added alone is related to the mix of schools within a chain or local authority. Therefore, as with attainment, an approach looking at changes in using value added needs to allow for this relationship.

Challenges in using value added as a measure of performance

Differences between schools with the same value added

As with grouping by previous attainment outcomes, schools with similar levels of value added can have a wide range of characteristics. This is expected since the purpose of value added is to aid comparisons between schools with different intakes.

By grouping according to previous value added scores, there is an assumption that schools with the same value added have the same propensity to demonstrate improvement. However, there remain a range of characteristics for which there are no controls and which may affect the propensity of a school (and hence academy chain or local authority) to demonstrate improvement.

For example, in *figure 3.5* schools are grouped not only by their previous value added outcomes in 2013 but also the average prior attainment of their key stage 4 cohort. This shows that between 2013 and 2014 schools with low prior attainment had, on average, lower improvement scores than schools with high prior attainment.

But the picture is complex. *Figure 3.6* presents improvement in a similar way, but this time between 2010 and 2014. Here, there is much less difference between the prior attainment groups. Finally, in *figure 3.7* the same approach is used but this time looking at changes between 2012 and 2013. In this instance schools with the lowest prior attainment tend to show higher improvement scores than those with high prior attainment. The difference from the 2013 to 2014 analysis may reflect the reforms to accountability in 2014 (see section 5.)

For the purposes of this statistical working paper, schools are grouped only by their previous value added outcomes. However, this analysis suggests that there is merit in investigating how this might be combined with other measures (such as school level prior attainment) whilst maintaining consistency with the performance tables (where contextual factors are not used in value added measures) and ensuring a sufficient number of schools in each comparator group. The use of such alternative groupings would be likely to lead to different results at academy chain and local authority level.

Figure 3.5: Average change in key stage 2-4 'best 8' value added between 2013 and 2014 in state-funded mainstream schools by average prior attainment of key stage 4 cohort
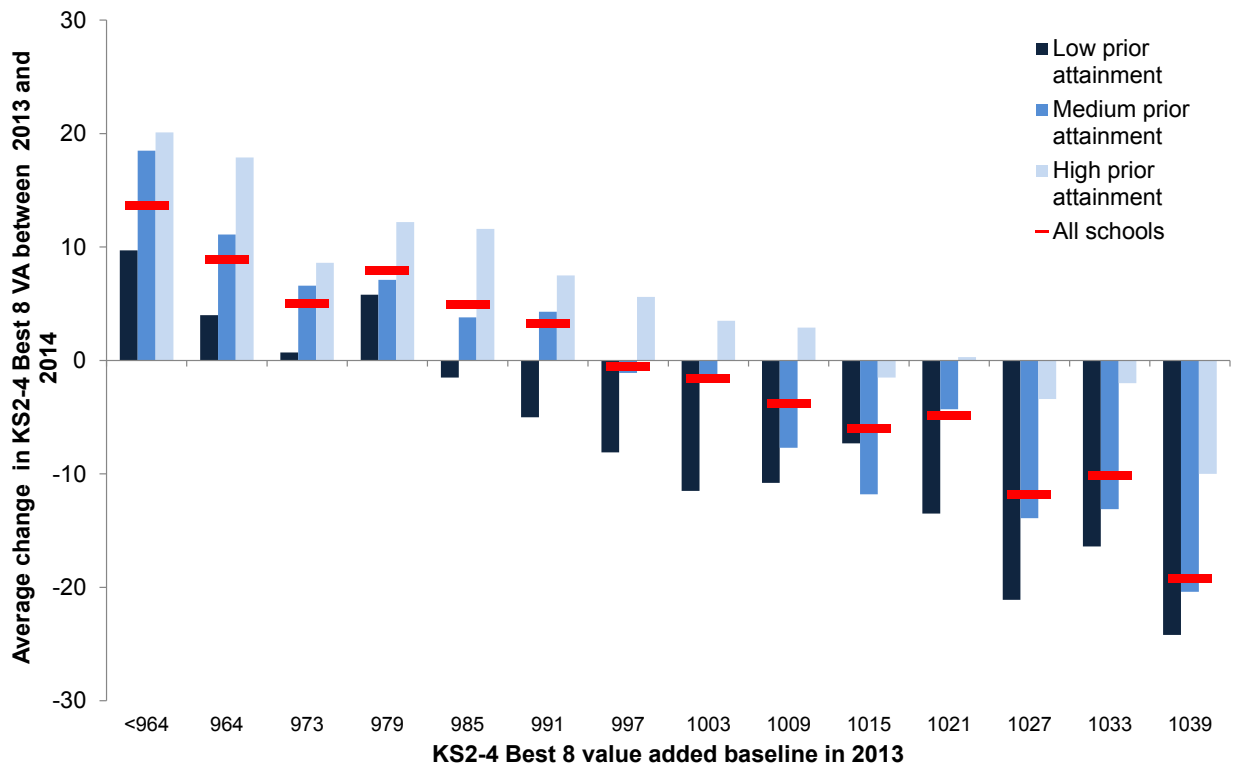

Figure 3.6: Average change in key stage 2-4 'best 8' value added between 2010 and 2014 in state-funded mainstream schools by average prior attainment of key stage 4 cohort
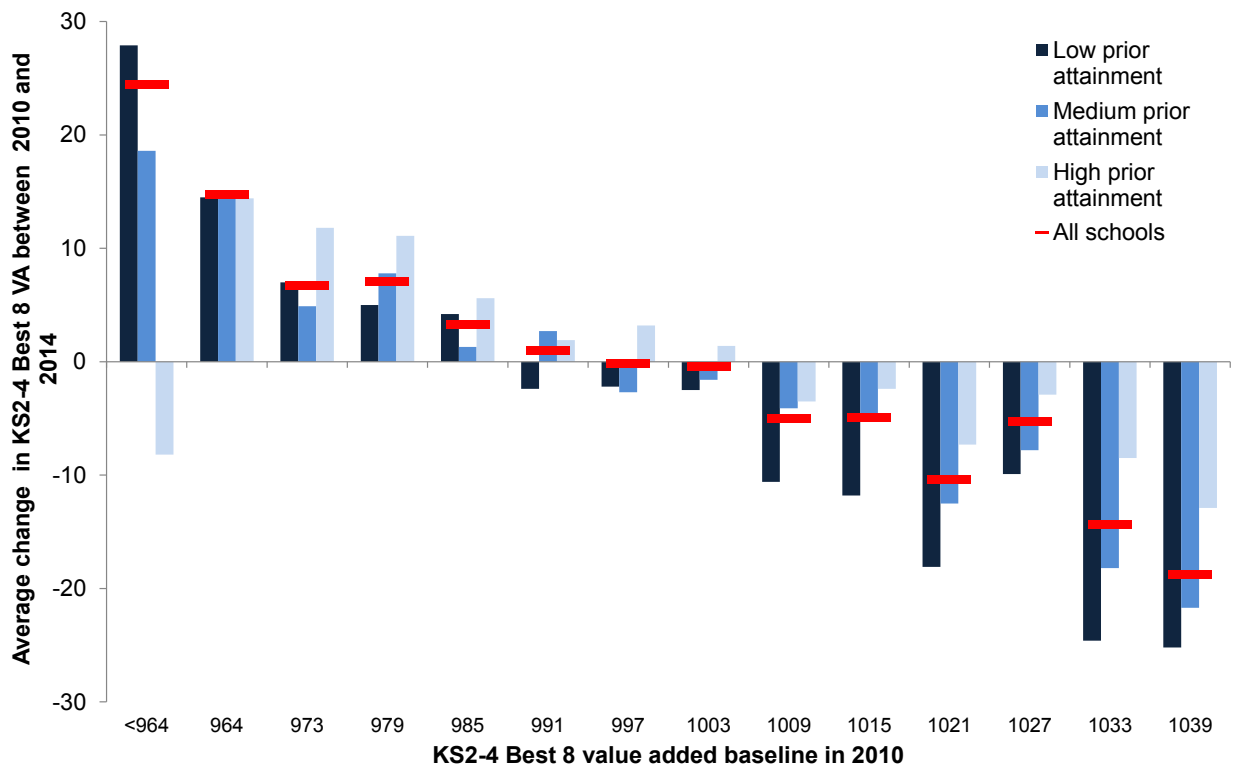
Figure 3.7: Average change in key stage 2-4 'best 8' value added between 2012 and 2013 in state-funded mainstream schools by average prior attainment of key stage 4 cohort
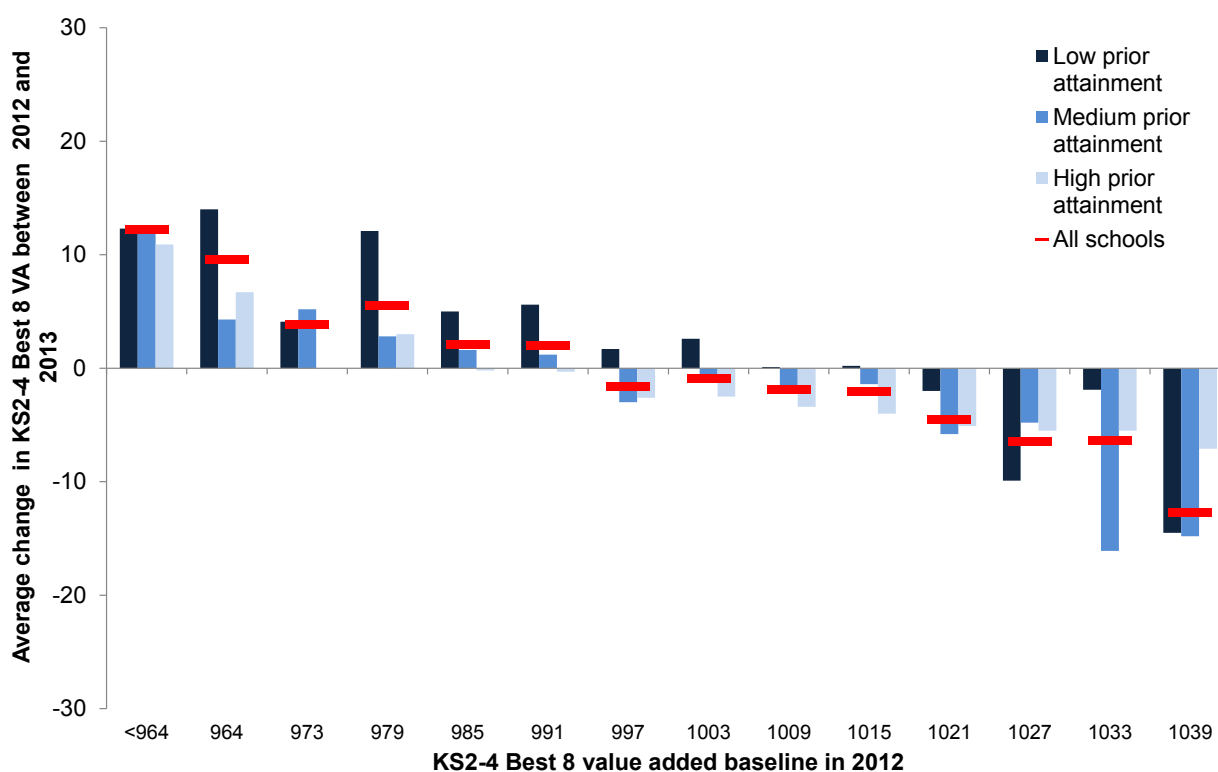
Level of uncertainty

Value added measures compare the performance of pupils to those with similar prior attainment nationally and therefore provide an estimate of the effectiveness of a school.

When assessing a school's performance, it should be noted that it is based on a given set of pupils' results. A school could have been equally effective and yet the same set of pupils might have achieved slightly different results and the school would almost certainly have shown different results with a different set of pupils.

For these reasons, the department presents value added measures with confidence intervals. Confidence intervals are provided as a proxy for a range in which users can be confident that the true value added score lies. The size of a confidence interval is determined by the number of pupils included in the value added measure and the spread of pupil scores nationally. Smaller schools have wider confidence intervals because their value added score is based on a smaller number of pupils.

When measuring the change in value added at school level, there are three components:

- the current value added of the school;

- the historic value added that improvement is measured against; and

- the average change in value added in the comparison groups.

Each of these will have a level of uncertainty and so any measure based on value added needs to take this level of uncertainty into account.

Proposed approach – using current value added and change over time

Given the relative strengths and weaknesses of measures of attainment and value added, this paper proposes two measures of the performance of schools within academy chains and within local authorities that are based on value added.

The first measures "current performance" by taking an average of the current value added in each relevant school. This measure can be considered to be an attempt to answer the question:

How much progress are the pupils in this chain or local authority currently making in comparison to average (based on pupils with similar prior attainment nationally)?

The second measures "relative improvement" in a chain or local authority over time. It does this by comparing changes in value added measures across years to schools with a similar starting point. This measure can be considered to be an attempt to answer the question:

How much has the effectiveness of the schools in this chain improved compared to schools with a similar starting point?

The approach to calculation of these measures is set out in section 4.

Summary and questions

This section has considered a range of approaches to summarising the performance of schools within academy chains and local authorities.

Simple aggregations of attainment measures can lead to spurious conclusions about performance within a chain or local authority since they can often largely reflect the type of schools that have entered into the chain relationship or remain with a local authority. More generally, measures of attainment do not account for the pupil intake of a school. A school may be highly effective in terms of the progress that pupils make but still have attainment that is relatively low. Even when controlling for previous outcomes, measures of the improvement in attainment can also lead to misleading conclusions. This is because schools with the same level of attainment can be performing very differently, depending on their intakes.

Value added is a measure of school effectiveness that examines the performance of schools having controlled for prior attainment. Therefore, two measures using value added are proposed - one that captures how schools within chains and within local authorities are currently performing and one that shows how that performance has changed over time.

Measures of value added are estimates with a degree of uncertainty which should be recognised in measures derived from them, particularly when looking at changes over time. The nature of value added means that two schools with the same score can have very different characteristics which may affect rates of improvement. The analysis presented in this section reveals a complex relationship but suggests that there is merit in investigating how previous value added outcomes might be combined with other factors as the measures are developed further.

- Do you believe that value added provides a fair basis for comparing academy chains and comparing local authorities?
- Do you believe that measures of attainment (such as the EBacc) should be considered,

either instead of, or alongside, measures of value added?

- Do you agree with the proposal to have two measures, one measuring the current performance of schools and one measuring their improvement over time, or is a wider set of indicators required?
- Do you believe that grouping schools by previous value added outcomes is fair or do you prefer another approach?
- Do you believe that the approach to the construction of comparator groups provides meaningful comparisons and what further data (if any) should be considered when constructing comparator groups?

4. Working methodology: *current* school value added and *change* in school value added within academy chains and local authorities

This working paper proposes two measures that capture how schools within chains and within local authorities are currently performing and how that performance has changed over time. This section sets out how each of these two measures is calculated at academy chain or local authority level. Recognising that value added is an estimate of school effectiveness with a degree of uncertainty, this section goes on to describe how confidence intervals are applied to aid interpretation and reduce the risk of spurious conclusions being drawn.

Measure 1: current school value added

This measure captures the average of current value added scores within chains and local authorities.

Measures of change in results, whether in terms of attainment or value added, show how schools are improving between a baseline year and the current time. However, in many cases, particularly in local authorities and older academy chains, there may have been significant improvements in performance prior to that baseline year. While the performance of schools may no longer be improving at a faster rate than other schools, they may still be sustaining this higher level of performance. Similarly, schools in other chains or local authorities may be improving rapidly but still have relatively low performance overall.

Therefore, a summary of the current level of performance of schools within a chain or local authority provides an important dimension to understanding performance.

This measure is an average of value added scores within the chain or local authority weighted by number of pupils and the length of time the school has been with the academy chain or local authority.

School level scores

School level value added scores at key stage 4 in 2014 are taken directly from the school performance tables:

http://www.education.gov.uk/schools/performance/

Further information on the value added methodology is available from the performance tables technical guidance:

http://www.education.gov.uk/schools/performance/secondary_14/documents.html[8]

Chain and local authority scores

The overall score for a chain or LA at each key stage is the weighted average of the individual school scores. The weight is based on:

- the number of pupils in the cohort (so that a school's contribution to the overall score

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[8] Similar guidance for value added at key stage 2 is provided here:
http://www.education.gov.uk/schools/performance/primary_14/documents.html

> is proportional to its size); and

- the length of time a school has been with a local authority or academy chain (so that those that have been there the longest are given the greatest weight).

Schools that have been with the chain or local authority for one year are given a weight of 1, those with the chain or local authority for two years are given a weight of 2 and so on up to a maximum weight of 5. *Figure 4.1* below provides an example academy chain with five academies with a value added score at key stage 4.

Figure 4.1: Example calculation of a chain or local authority current value added score based on the individual school scores

	(i) Current value added score	(ii) Number of pupils in end of key stage cohort	(iii) Number of years with academy chain or local authority	(iv) Total weight (ii) x (iii)	(iii) weighted score (i) x (iv)
Academy 1	1000.3	160	5	800	800240.0
Academy 2	1015.8	150	2	300	304740.0
Academy 3	980.3	190	3	570	558771.0
Academy 4	990.6	210	4	840	832104.0
Academy 5	1020.1	155	1	155	158115.5
	Total	865		2665	2653970.5

Overall score (sum of weighted scores / sum of weights)	995.9

Note that this approach to weighting by length of time open gives a relative weighting *within* each chain or local authority. If all of the schools joined the chain at the same time, or had been with the local authority for the same length of time, the weighting would have no effect.

Measure 2: change in school value added within academy chains and local authorities

This measure captures the change in school level value added (VA) scores between a baseline year and the current year in comparison to schools with similar value added in the baseline year. The baseline year is taken as the last year as the predecessor school (if applicable) or five years ago whichever is more recent.[9]

The resulting score is a 'standardised' score that is unit free. Therefore the next stage of the process translates this score back onto a common scale (i.e. GCSE and equivalent points).

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[9] This represents the usual duration of key stage 3 and key stage 4.

<u>School level scores</u>

The proposed approach for a school's improvement score is

$$= \frac{(VA\ score\ in\ current\ year - VA\ baseline\ score) - average\ change\ in\ VA\ comparison\ group}{Standard\ deviation\ of\ changes\ in\ VA\ comparison\ group}$$

The 'VA baseline score' is the average of the VA in the baseline year and the previous two years (where available.) Value added measures are subject to volatility, so the aim of taking an average over several years in the baseline year is to protect against a school having an atypical result in the baseline year that then informs its improvement score for a number of years.

In some cases, schools have multiple predecessor schools open in the baseline year. In these cases the results of predecessor schools are merged together.

The steps in the calculation of the measure of change in value added are:

- group schools by their value added baseline score;
- calculate the change in value added for each school as the difference between current value added and its baseline score[10];
- calculate the average change in value added within each group;
- calculate the school's improvement relative to the average improvement in their value added group; and
- divide the improvement score by a measure of spread of scores within the group.

The approach to this calculation is illustrated through a school that achieved a value added score of 995.0 at key stage 4 in the current year, having achieved a baseline score of 987.2. The principles of this approach could also be applied to measures at key stage 2.

The choice of output measures is discussed in section 5.

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[10] Note that the current value added score is the value added in the current year and, unlike the baseline score, is not an average over several years. This is discussed further in section 5.

Step 1: Group schools by their value added baseline score. All schools with similar value added in the baseline year are grouped together[11]. The change in value added for each school between the baseline year and the result year is calculated.

The blue dots represent individual schools and their improvement in value added between baseline and result
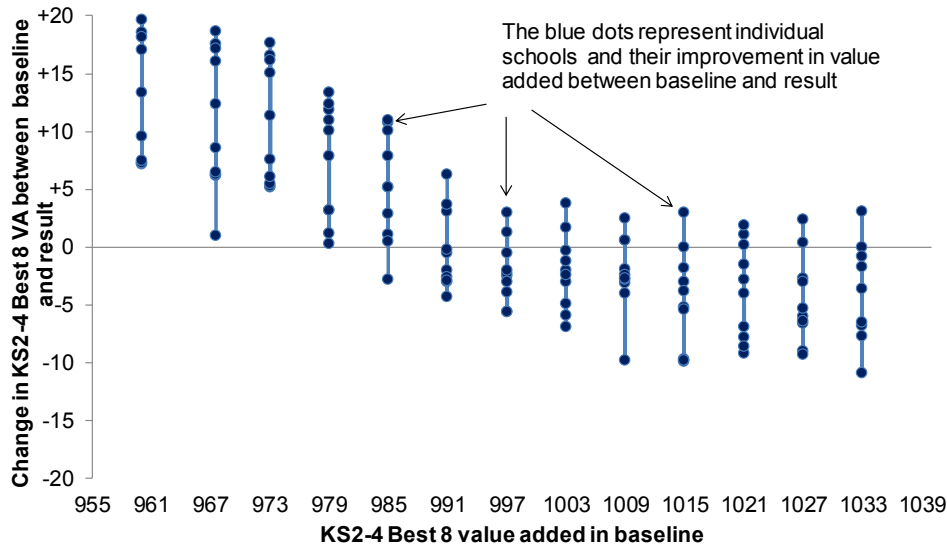
Note: All data is illustrative

Step 2: Calculate the average change in value added within each group. This is the arithmetic mean of all changes in school level value added scores within that group.

The red bars represent the mean change in value added within each group
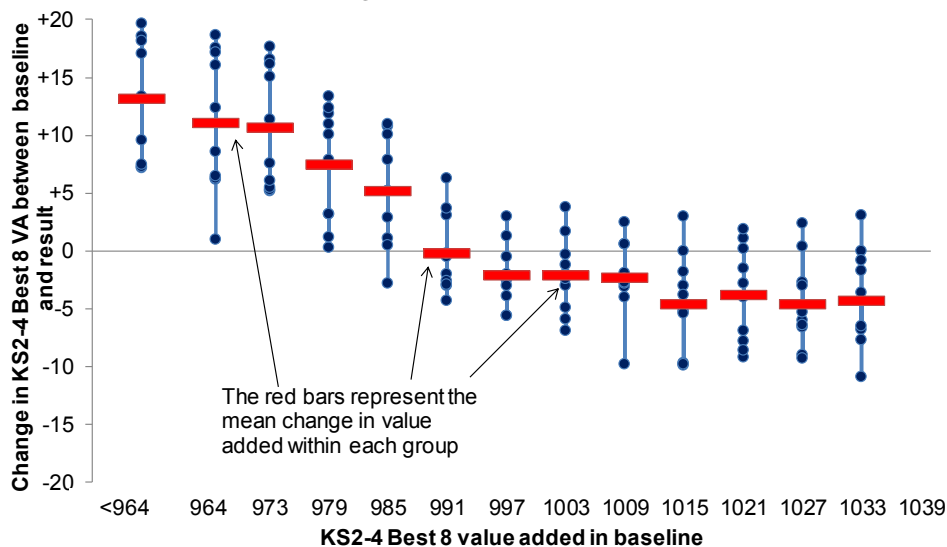
Note: All data is illustrative

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[11] Note that while each school has one "baseline year" it will appear in all comparator groups where it has the relevant data. For example, a school may have itself a baseline year of 2009 but its 2010 result will appear as a comparator school for schools with 2010 as a baseline and its 2011 results will appear as a comparator school for schools with 2011 as a baseline and so on.

Step 3: Calculate the school's improvement relative to the average improvement in their value added group. i.e. take the school improvement and subtract the group average. This is to control for the fact that those with the lowest value added tend to see the largest improvements and vice versa
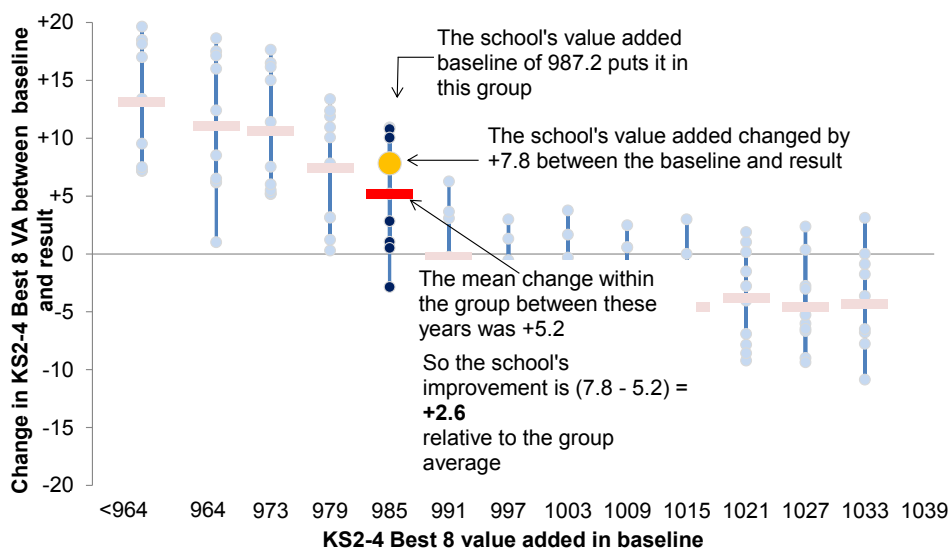
Note: All data is illustrative

Step 4: Divide the improvement score by a measure of spread of scores within the group.[12] This reduces the risk of bias caused by some groups having a wider spread of results than others (either comparing between start points, or by different lengths of time open.) If this was the case, then extreme values from highly spread groups would carry more weight than those from other groups.
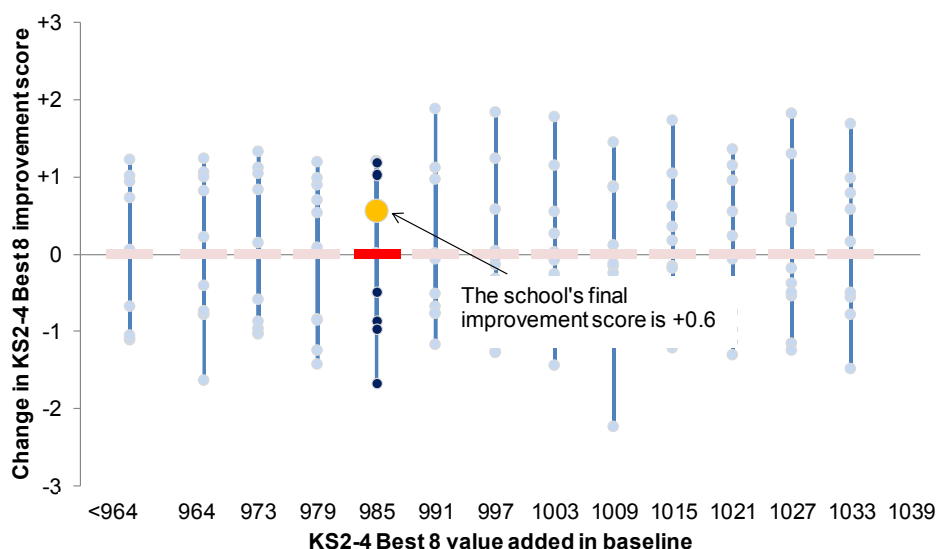
Note: All data is illustrative

Group averages and standard deviations for 2014 are provided in section 9.

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[12]Spread is measured as the standard deviation of scores within the group.

Academy chain and local authority level scores

The overall score for a chain or local authority is the weighted average of the individual school scores. The weight is based on:

- the number of pupils in the cohort, so that a school's contribution to the overall score is proportional to its size; and
- the length of time a school has been with a local authority or academy chain, so that those that have been there the longest are given the greatest weight.

Schools that have been with the chain or local authority for one year are given a weight of 1, those with the chain or local authority for two years are given a weight of 2 and so on up to a maximum weight of 5.

Figure 4.2 below provides an example academy chain with five academies with an improvement score at key stage 4.

Figure 4.2: Example calculation of a chain or local authority improvement score based on the individual school scores

	(i) Improvement score	(ii) Number of pupils in end of key stage cohort	(iii) Number of years with academy chain or local authority	(iv) Total weight (ii) x (iii)	(iii) weighted score (i) x (iv)
Academy 1	0.63	160	5	800	504.0
Academy 2	-0.15	150	2	300	-45.0
Academy 3	0.81	190	3	570	461.7
Academy 4	-0.32	210	4	840	-268.8
Academy 5	0.95	155	1	155	147.3
	Total	865		2665	799.2
Overall score (sum of weighted scores / sum of weights)					+0.30

Note that this approach to weighting by length of time open gives a relative weighting *within* each chain or local authority. If all of the schools joined the chain at the same time, or had been with the local authority for the same length of time, the weighting would have no effect.

The result is a point estimate for the relative change in school effectiveness for each school. However, there is a degree of uncertainty around value added scores in both the input and output measures and so this score represents the central point of a range of values in which the true value is likely to fall. This is addressed in the section 'applying confidence intervals' below.

Translation to GCSE outcomes

Value added scores are centred round 1000 at key stage 4, and differences from this are measured in GCSE (and equivalent) points. For example, a score of 1006 at key stage 4 means that, on average, pupils in the school achieved one grade higher in one GCSE than similar pupils nationally. Similarly a simple year-on-year change is also measured in GCSE points.

The value added improvement score (as derived from the improvement methodology) is known as a 'standardised score'; this enables comparison between different groups and different time periods on a consistent basis. However, unlike value added scores, it does not have associated units of measurement and hence cannot be interpreted directly in terms of pupil attainment.

It is, however, important that the measure can be interpreted in such a way so as to have a 'real world' meaning. Without this, there is an increased risk of the score being seen as a statistical 'black-box' which will reduce its credibility and make interpretation difficult.

The proposed approach is to remove the standardisation by treating the chain or local authority as if it were a school that started as broadly average on value added (i.e. it had a value added of around 1000 at key stage 4.) In effect, the proposed approach answers the question

"If this chain or local authority was a school that had started with an average value added, what relative improvement in one year would have given it this score on the new measure?"

Standardisation was carried out by dividing the relative improvement by the spread (standard deviation) of results in each comparison group. Therefore, to remove the standardisation, we multiply the overall improvement score by the standard deviation of improvements over one year of schools that had previously been broadly average (i.e. which were in the middle grouping of value added).

As the spread of scores varies within each value added group, applying one value to all schools may result in a score which, on the face of it, is different from what the chain or local authority achieved. This would be particularly true if the majority of a chain or local authority's schools were in one of the lower value added groups where the spread of scores tends to be wider.

However, the resulting comparison with other chains or local authorities is fairer than the simple change in value added and this issue would in fact have very little impact on the majority of scores as they arise from schools that are not in the extreme groups.

This leads to a measure that is in GCSE and equivalent points and is phrased in the style:

"The performance in this chain or local authority means that its schools have on average improved progress by three points, or half a GCSE grade, in a year compared to schools with a similar starting point"

Application of confidence intervals

Measurement of school effectiveness using value added is based on the results for a given set of pupils. A school could have been equally effective and yet the same set of pupils might have achieved slightly different results, and the school would almost certainly have shown different results with a different set of pupils.

When considering improvement in value added, there is therefore a degree of uncertainty in both the input and the output measure. It follows that there is a degree of uncertainty in the improvement measure calculated for each academy chain or local authority since this is derived from these school scores.

When the department presents value added measures for schools, it includes confidence intervals. Confidence intervals are provided as a proxy for the range in which users can be confident that the true value added score lies. The size of a confidence interval is determined by the number of pupils included in the value added measure and the spread of pupil value added scores nationally. Smaller schools (for example one form entry primary schools) have wider confidence intervals because their value added score is based on a smaller number of pupils.

<u>Confidence intervals around school measures at key stage 4</u>

Given a school's value added score at key stage 4, 'ks24_VA', the confidence interval around this score is given by:

$$\text{ks24\_VA} \pm 1.96 \times \sqrt{\frac{\sigma^2}{n}}$$

Where σ^2 represents the variance of pupil value added scores across all pupils nationally and n represents the number of pupils in the school that are included in the value added measure.

Given a change in a school's value added score at key stage 4, 'ks24_VA_change', between two years, y_1 and y_2, the confidence interval around this change is given by:

$$\text{ks24\_VA\_change} \pm 1.96 \sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}$$

As before, σ^2 represents the variance of pupil value added scores across all pupils nationally and n represents the number of pupils in the school that are included in the value added measure. The subscript denotes the year to which the data refers (i.e. y_1 or y_2).

<u>Confidence intervals around academy chain and local authority scores</u>

In the previous section, the output for the chain or local authority score was translated back to GCSE points by treating the chain or local authority as if it were a school. Under that

assumption, the proposed approach for confidence intervals around that performance measure is derived in exactly the same way as for a school.

Given a chain or local authority current value added measure at key stage 4, its confidence interval is given by:

$$\text{Chain or LA current value added measure} \pm 1.96 \times \sqrt{\frac{\sigma^2}{n}}$$

The chain and local authority improvement measure at key stage 4 has a confidence interval of:

$$\text{Chain or LA improvement measure at KS4} \pm 1.96 \sqrt{\frac{\sigma_1^2}{n} + \frac{\sigma_2^2}{n}}$$

Where, σ^2 represents the variance of pupil value added scores across all pupils nationally and n represents the number of pupils in the chain or local authority that are included in the value added measure. The subscript denotes the year to which the data refers (i.e. y_1 or y_2).

Indicative confidence intervals in 2014

Figure 4.3 below sets out the values of W, B and σ in 2013 and 2014 and *figure 4.4* sets out the size of confidence intervals for examples of different chain and local authority sizes.

Figure 4.3: Data on the variance of pupil value added scores used in confidence interval calculations

	2013	2014
GCSE and equivalent - σ	67.4	73.2
GCSE only - σ	83.6	80.5

Figure 4.4: The size of confidence intervals in 2014 based on a range of chain or local authority sizes.

Number of pupils	GCSE and equivalent improvement	GCSE only improvement	GCSE and equivalent current	GCSE only current
500	+/-8.7	+/-10.2	+/-6.4	+/-7.1
1000	+/-6.2	+/-7.2	+/-4.5	+/-5.0
5000	+/-2.8	+/-3.2	+/-2.0	+/-2.2

Limitations of proposed approach to confidence intervals

The underlying assumption, consistent with the aggregation of school results, is that a local authority or chain is a collection of pupils rather than a collection of a set of schools. The resulting confidence intervals will be narrower than those seen at school level since the results are based on multiple schools and many more pupils.

However, treating an academy chain or local authority as a collection of pupils can underestimate the true size of the confidence intervals. The underlying approach to value added scores does not take into account that pupils are clustered within schools which are then clustered within academy chains or local authorities. It may be possible to structure this

data further to recognise these relationships. The resulting confidence interval around a current value added measure for an academy chain or local authority would then be likely to be wider since the academy chain or local authority would be treated as a collection of schools, and not as a collection of pupils.

Furthermore, improvement scores are based on an improvement score for a school relative to a group average. Given that it is based on school level value added data, that group average also has a degree of uncertainty.

Summary and questions

This section has set out two measures that capture how schools within chains and within local authorities are currently performing and how that performance has changed over time based on measures of value added.

The 'current performance' measure is based on an average of school value added scores (weighted by pupil numbers and the length of time that the school has been under the academy chain or local authority). The improvement measure examines how school value added has changed over time. The change in a school's value added score is compared to other schools with a similar value added score in a baseline year.

Recognising the uncertainty around value added measures, scores are presented with confidence intervals. The proposed approach to confidence intervals treats academy chains and local authorities as a 'large school'. This may, however, underestimate the size of the confidence intervals.

- Do you agree with the approach to 'current value added' i.e. a weighted average of school level value added scores?
- Do you agree with the approach to calculating a standardised improvement score for schools? That is:
  - calculating a baseline score using a three year average where possible;
  - calculating the improvement between this score and the current (one year) value added;
  - comparing this improvement with the average of improvements within a comparison group;
  - standardising this score by dividing by the spread (standard deviation) of school scores within the comparison group?
- Do you agree that schools should be weighted by length of time open so longer established schools contribute more to academy chains and local authorities?
- Is the approach to putting scores back on a 'real world' scale appropriate?
- Do the confidence intervals adequately address the level of uncertainty in each of the measures?

5. Known issues and mitigation

The department believes that the proposed measures provide a useful base from which to raise the debate around the relative performance of schools within local authorities or within academy chains. The underlying data is based on well-established measures of school performance and represents the best data available at this point.

However, there are also challenges in applying existing data sources to the question of performance within academy chains and local authorities. For example, measures that are included in performance tables change over time, as does the data available to the department. There are also a number of decisions that have been taken in constructing these measures which can affect this summary of performance of an individual chain or local authority in comparison to others - measures constructed on a different basis may lead to different results.

The purpose of this section is to set out these issues, explain why particular decisions have been taken and consider how the department might develop these measures further in future as other data becomes available.

The department is considering calculating equivalent performance measures at key stage 2 once the principles of the measure have been established. Therefore, this section also includes discussion specific to the performance of primary schools.

Performance measures for secondary schools

The proposed measures use the current key stage 4 performance tables value added methodology known as 'best 8'. This captures a pupil's best qualifications across the equivalent of 8 GCSEs, with bonuses for performance in English and mathematics.

Prior to 2014, the best 8 measure was vulnerable to the inclusion of a wide range of equivalent qualifications that are no longer included in performance tables. Schools may have seen a fall in performance on this measure in 2014 because of this change in the measure rather than an underlying change in standards (although, as set out above, the change is not as large as the changes seen in raw attainment figures, since value added is a relative measure at both school and pupil level.)

The department has considered alternative approaches with a greater focus on academic subjects. The first option is to use a value added measure that is based on English and mathematics GCSEs only, rather than a range of subjects. This has several advantages. Firstly, it would not be affected by changes to the range of qualifications included in performance measures from 2014. Secondly, the vast majority of pupils across all schools enter these subjects (and it has formed part of the key 5+ A*-C including English and mathematics measure for a number of years). Thirdly, it recognises performance in two key academic subjects. However, such a measure risks rewarding a very narrow curriculum offer in which performance in English and mathematics could be at the expense of other subjects.

From 2016 (and, for schools that decide to opt-in early, 2015), minimum standards in secondary schools will be based on the new 'progress 8' measure. Progress 8 measures pupil performance (compared to pupils with similar prior attainment) across eight subjects with a

focus on core academic subjects with 'slots' reserved for English and mathematics and three additional EBacc subjects. Therefore, it may be desirable to use this in a measure of performance within chains and LAs.

However, an historic time series of progress 8 is problematic since this would entail retrospectively applying a standard to schools that was not in place at the time and that is considered unfair. Not all qualifications included in the measure were available in the years that form the baseline positions and, more significantly, differences in progress 8 outcomes will be driven not only by varying standards, but also by different curriculum choices. If that system of accountability had been in place at that time, then it is likely that the decisions taken by schools in terms of curriculum choice would have been different.

As performance tables move towards the new progress 8 measures, this can be reflected in measures of performance within chains and local authorities.

In the interim, the department's preferred approach is to include additional chain and local authority measures which capture value added over eight subjects but, unlike the existing 'best 8' measure, restricts this to GCSEs and does not include equivalent qualifications. These additions are provided for both "current value added" and "improvement".

Whilst this still does not fully reflect the system of accountability in place at the time, it does not restrict the subjects that are included in the measures in the same way as would be the case if using progress 8.

Performance measures for primary schools

Key stage 1 to 2 value added is a measure of the progress that pupils make between assessment at the end of key stage 1 (based on teacher assessments in reading, writing and mathematics) and key stage 2 (based on tests in reading and mathematics and teacher assessment in writing.[13] This is the only data that the department holds on the performance of pupils in primary schools that is consistent across all schools.

Pupils usually reach the end of key stage 1 at age 7, this means that the key stage 1 to 2 value added measure only captures progress over part of the primary phase and no progress data is available for infant schools.

In March 2014, the Government published its response to the consultation on primary school assessment and accountability. It set out that a new floor standard based on the progress made by pupils from reception to the end of primary school will be introduced at key stage 2. This will be underpinned by a new assessment in reception that will capture the school's starting point from which progress will be measured.

The response also reflected concerns about the consistency and reliability of key stage 1 assessment (even after moderation) which, in turn, leads to concerns about the reliability of measures of progress based upon it.

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[13] Prior to 2012, assessment in writing was also through a test.

Data on the new basis (with the reception baseline) will not be available until 2022. However, data based on the new key stage 1 assessments will be available in 2020. In the interim, progress will continue to be assessed using existing key stage 1 assessments.

On a practical level, the existing key stage 1 assessments will remain the only viable baseline position for a number of years. The choice at this stage is not whether there is something better than existing key stage 1 measures but whether those measures are better than using raw attainment at key stage 2. Statistically, there remains a good correlation between key stage 1 and key stage 2 and performance tables will continue to use key stage 1 as a baseline for the next four years.

Therefore, if the department was to produce measures of performance within academy chains and local authorities at key stage 2, they are likely to be based on value added that measures progress between key stage 1 and key stage 2, recognising that this does not capture chain and local authority performance over reception and key stage 1. As performance tables move towards new measures of progress that cover the whole of primary, the methodology could incorporate them.

Comparability of underlying data over time

The proposed improvement methodology examines changes in school value added scores over multiple years.

Any methodology that examines school performance over time is affected by changes to assessment and accountability. In recent years this has included changes to accountability at key stage 4 in 2014 (including the implementation of the recommendations of the Wolf review which limits the range and number of qualifications that are included and the use of first entry rather than best entry[14]) and also changes to the assessment of English at key stage 2.

The use of value added mitigates against the impact of such changes to a large extent. This is because such measures capture performance relative to other schools (rather than to an absolute standard) and they are hence less affected by year-on-year changes than headline measures of attainment. However, use of value added does not eliminate the issue of changes to the accountability measures entirely since some schools can be disproportionately affected by reforms.

The impact of changes over time is further mitigated by ensuring that the underlying value added methodology is consistent through the period of assessment. Value added methodologies have evolved over the time period being considered. In fact, for many schools their baseline year in this methodology falls when school performance tables used contextual value added (a measure of performance that accounted not only for prior attainment but also pupil and school characteristics). Therefore, for the purposes of this measure, historic school scores have been re-calculated using the value added methodology that was used in the 2014

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[14] For further information on how these reforms affect performance measures see:
DfE (2015): *"Revised GCSE and equivalent results in England: 2013 to 2014"*
https://www.gov.uk/government/statistics/revised-gcse-and-equivalent-results-in-england-2013-to-2014

performance tables. This means that the underlying data may differ slightly from published measures.

Constructing discrete groups of schools using value added

In the improvement measure, schools are grouped together based on their value added score in a baseline year (where available, this is the average of value added over three years). The groupings have been constructed so that:

- there are a sufficient number of schools in each group;

- the group boundaries apply over a number of years (to avoid complexity of different groupings for different years); and

- the cut-offs ideally have some educational meaning (e.g., the gaps of six points in the key stage 4 measure are the equivalent of one grade in one GCSE subject).

Nevertheless the precise cut-offs are still arbitrary to a certain extent. This has the potential to impact on the score of an individual school and hence on the score at academy chain or local authority level. Therefore, we tested what effect using alternative cut-offs would have and found that using slightly different cut-offs had very little effect on the overall measures. For example, if all of the thresholds at key stage 4 were increased by three points, the result would be that:

- over two thirds of academy chains and local authorities would change by less than 1 point (one-sixth of a GCSE grade);

- no academy chains and local authorities would change by more than 3 points (half a GCSE grade);

- 6% of academy chains and local authorities would change significance state (i.e. would change from not statistically different from average to statistically different from average or vice versa.); and

- no results would be outside the confidence intervals presented.

There are likely to be two reasons for this limited effect. Firstly, the neighbouring groups tend to have similar changes in value added (apart from those with very high or very low value added in the baseline) and, secondly, most chains and local authorities have a mix of schools, some of which would see increases while some see falls.

An alternative approach to grouping would be to fit a statistical model through all school improvement scores. This would have the benefit that two schools with very similar value added would always be compared to a very similar average improvement rate (i.e. there would not be the risk of them falling into different groups). However, it would also introduce an additional level of complexity to the approach and, given the relative stability of measures to changes in group cut-offs, the simpler approach is adopted in this statistical working paper.

As with grouping by previous attainment outcomes, schools with similar levels of value added (as a proxy for having similar levels of 'effectiveness') can also have a wide range of

characteristics. This is expected, since the purpose of value added is to aid comparisons between schools with different intakes.

Grouping by previous value added scores involves an assumption that schools with the same value added have the same propensity to demonstrate improvement. However, there remain a range of characteristics (that are not controlled for) which may affect the propensity of a school (and hence academy chain or local authority) to demonstrate improvement.

The analysis set out in section 3 suggests that there is merit in investigating in future how value added might be combined with other measures (such as school level prior attainment) whilst maintaining consistency with the performance tables (where contextual factors are not used in value added measures) and ensuring a sufficient number of schools in each comparator group. However, the picture is complex and relationships are not necessarily consistent across different time periods. Therefore, a simpler approach is presented for this statistical working paper.

Using a single year of value added as the output measure

When considering the improvement measure the baseline value added is taken as the average value added over three years. Value added measures are subject to volatility and the aim of taking an average over several years in the baseline year is to protect against a school having an atypical result in the baseline year which then informs its improvement score for a number of years.

The same approach could also be applied to output measures. This would reduce the level of uncertainty in the measure (i.e. it would have narrower confidence intervals) and reduce volatility, particularly in chains and local authorities with small cohorts.

However, it would also introduce a significant lag between when a school joined an academy chain or local authority and when it could be included in its results. In particular, it would greatly reduce the proportion of primary sponsored academies that could potentially be included and hence the number of chains for which data would be published if this methodology was applied to key stage 2. Given the rapid expansion in the number of primary sponsored academies in recent years, the impact would be significant. In 2014, 420 sponsored academies had results at key stage 2. Of these, only 150 had been open for two or more years and only 34 had been open for three or more years.

Taking an average in the output measure would also mean that changes in performance may not be noticeable for several years since they would be masked by performance in the earlier years.

On balance, the preferred approach at this time is to use the current value added and not an average over multiple years.

Cut-off point for inclusion within a chain or local authority

In the performance tables, the school type (e.g. sponsored academy or community school) is taken at the start of September in the academic year to which the results refer. This means that results are only attributed to the school if it has been open for a full academic year. For

example, schools that convert to academy status part way through the year have their results published against the predecessor school.

The new measures are consistent with this approach. In order for a school to be included within the results of a chain or local authority, it has to have been with that academy chain or local authority at the start of the academic year. In order to be included within an academy chain measure in 2014, a school had to join that chain by 11 September 2013. Schools that move between chains part way through the academic year will have their results included within their original chain. Similarly, local authority schools that became academies part way through the academic year will have their results included within those of the local authority.

Schools that are excluded as they have no performance data

The proposed measures examine performance at key stage 4 and the department intends to calculate equivalent performance measures at key stage 2 once the principles of the measure have been established. However, there are a variety of institutions that do not have results at either key stage 2 or key stage 4. These are set out below. Additional contextual information for each chain and local authority will show how many schools each has and how many are included in the performance measures. Users should consider this when interpreting results.

Infant schools

As set out above, measures of performance in primary schools are likely to be based on the progress of pupils between key stage 1 and key stage 2. This means that primary schools with a highest age that is less than 11, including infant schools and first schools, will be excluded from the analysis. This is the same approach as in performance tables where key stage 1 assessments are not published at school level.

16-18 institutions

Just as key stage 1 to 2 value added does not capture performance across the entire primary phase of education, so key stage 2 to 4 value added does not capture performance across all of secondary since it excludes performance at key stage 5. This means that schools with sixth forms are not assessed across their complete age range and post-16 provision is excluded entirely.

Post-16 value added is a relatively recent development that lacks a long time series with which to calculate the improvement measures set out in this paper. There are also additional complexities with performance measures post-16 due to the academic and vocational routes that students can take.

The department is not currently in a position to set out an analogous methodology to that proposed for key stage 4 for key stage 5 but will consider how such a methodology might be developed.

New provision schools

Not all academies replace existing institutions. Since September 2010 around 50 new provision academies have opened. Similarly, free schools are generally new provision (unless replacing existing independent schools). Many of these schools (and the same applies to new local

authority schools) are 'growing schools', meaning that rather than having pupils in all year groups, they fill from the lowest year group (e.g. a secondary school may have year 7 pupils in its first year, year 7 and year 8 pupils in its second year and so on).

This means that, although these schools have been open for a number of years, they do not yet have pupils at the end of a key stage and hence do not yet have published results.

Further breakdowns

The methodology presented in this statistical working paper provides a summary of performance within chains and local authorities across all pupils. There is the potential to develop the methodology further so that the performance of different groups – such as disadvantaged pupils or those with low prior attainment – can be explored. The department will consider how this might be achieved.

Summary and questions

Whilst the department believes that the proposed measures provide a useful base from which to raise the debate around the relative performance of schools within academy chains and local authorities, there are a number of considerations.

There are challenges in applying existing data sources to the question of performance within academy chains and local authorities. For example, measures that are included in performance tables change over time, as does the data available to the department. Methodological decisions can also affect measures of an individual chain or local authority in comparison to others and measures constructed on a different basis may lead to different results.

- Given the relative nature of value added, do you believe that it is sufficiently comparable over time for this purpose?
- Is using the current value added of a school sufficient or should this be averaged over several years (at the expense of losing a number of schools from the measure)?
- Do you believe that the approach of creating comparator groups provides meaningful comparisons?
- Academy results are only included within a chain's score if they have been part of that chain for at least one academic year. Do you favour a different inclusion point?
- How should we reflect the fact that not all schools have results?
- Could key stage 1 to 2 value added be used to develop similar performance measures for primary? If not, then are there alternatives you suggest we consider?
- What further breakdowns of the measures would you like to see?

6. Presentation and interpretation of measures of performance within academy chains and local authorities

The purpose of this section is to set out how the new measures will be presented and to help users in interpreting the results.

Whilst the performance measures for academy chains and local authorities are constructed using the same methodology, the roles and responsibilities of these organisations vary considerably. Therefore their results are presented separately in two tables:

- Performance at key stage 4 in academy chains; and
- Performance at key stage 4 in local authorities.

These can be found in section 8.

Contextual data

Whilst the methodology is designed to provide a fair comparison between chains or between local authorities in terms of the performance of their schools, the measures cannot fully summarise all the circumstances and characteristics that sit behind those results.

The purpose of providing contextual data is to help users understand the pattern of results by setting out the characteristics of the schools and pupils within each chain or local authority in the same way that contextual information is provided in the performance tables.

There are also a variety of institutions that are unfortunately excluded since they do not have results at key stage 4 and these are discussed in the previous section. The contextual information shows how many schools each chain and local authority has and how many are included in the performance measures. Users should consider this when interpreting results.

For academy chains there is additional data showing:

- the total number of schools in the chain that cover key stage 4; the total number included in the performance measures; the number of schools by type of academy; and the number of academies by length of time open.

- the proportion of their key stage 4 cohort that are: disadvantaged; recorded as having special educational needs at school action plus or with a statement; or have a first language other than English. In addition, the average prior attainment score across the chain is included.

For local authorities there is additional data showing:

- for the local authority *area*: the total number of state-funded schools that cover key stage 4; the number split by type of school (local authority maintained and type of academy);

- for *LA maintained schools*: the total number included in the performance measures; the number of schools by type of school; and

- the proportion of their key stage 4 cohort that are: disadvantaged; recorded as having special educational needs at school action plus or with a statement; or have a first

language other than English. In addition, the average prior attainment score across the local authority is included.

Performance measures

There are two measures calculated on two bases of key stage 4 performance within academy chains and local authorities:

Measure	What it is	Format
Current GCSE and equivalent value added	The average of school GCSE and equivalent value added scores within an academy chain or local authority to capture the current performance.	Score centred around 1000 in GCSE and equivalent points (where 6 points is one grade in one subject)
Improvement in GCSE and equivalent ('best 8') value added	New measure that captures relative improvement in value added over time in comparison to schools with a similar starting point	Score centred around 0 based in GCSE and equivalent points (where 6 points is one grade in one subject)
Current GCSE only value added	The average of school GCSE and equivalent value added scores based on GCSEs only within an academy chain or local authority to capture the current performance.	Score centred around 1000 in GCSE and equivalent points (where 6 points is one grade in one subject)
Improvement in GCSE only value added	The new measure that captures relative improvement in value added over time in comparison to schools with a similar starting point but restricted to GCSEs only and excluding equivalent qualifications	Score centred around 0 based in GCSE and equivalent points (where 6 points is one grade in one subject)

Confidence intervals

Measurement of school effectiveness through value added measures is based on the results of a given set of pupils. A school could have been equally effective and yet the same set of pupils might have achieved slightly different results, and the school would almost certainly have shown different results with a different set of pupils.

When considering improvement in value added there is, therefore, a degree of uncertainty in both the input and the output measure. It follows that there is a degree of uncertainty in the improvement measure calculated for each academy chain or local authority since this is derived from these school scores.

In recognition of this uncertainty, each measure set out above includes a confidence interval showing the range of values in which users can be confident the true value is contained.

Interpretation

What do the current and improvement value added scores at key stage 4 mean?

The *current value added* score at key stage 4 measures the performance of pupils within the chain or local authority compared to pupils with a similar starting point. It is centred round 1000, so scores above this represent chains and local authorities where pupils perform better than similar pupils nationally. It is measured in GCSE and equivalent points, where six points is equivalent to one grade in one GCSE subject. Therefore a score of 1006.0 can be interpreted as:

> *"Pupils in this chain or local authority achieve one grade higher in one GCSE subject than pupils with similar prior attainment nationally"*

The *improvement* score at key stage 4 measures the relative rate of improvement in comparison to schools with a similar starting point and is standardised to represent improvement over one year. It is centred round zero, so positive scores represent chains and local authorities where schools have improved more than other schools. It is measured in GCSE and equivalent points, where six points is equivalent to one grade in one GCSE subject. Therefore a score of +6.0 can be interpreted as:

> *"The performance in this chain or local authority means that its schools have on average improved progress by six points, or one GCSE grade, in a year compared to schools with a similar starting point"*

Is this result significant?

As performance within each chain and local authority is measured using value added which is an estimate of school effectiveness, there is a degree of uncertainty in these measures of performance. Confidence intervals show the range of values in which users can be confident that the true value lies. If the confidence interval includes the average score (1,000 for key stage 4 current value added and zero for improvement measures), then the result is not significantly different from average. This is illustrated in the examples in *figure 6.1.*

Figure 6.1 Assessing whether a score is significantly different from average
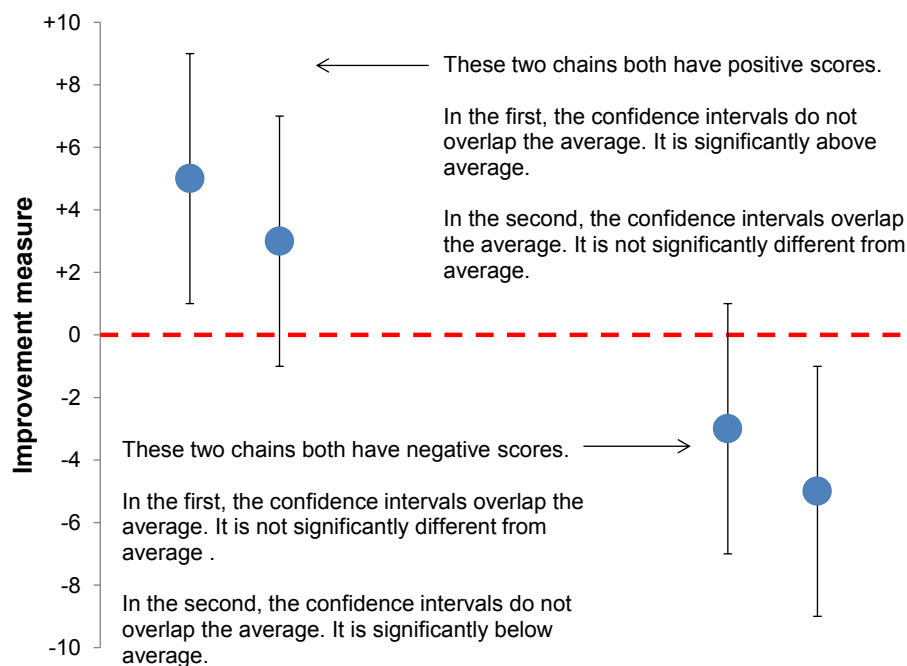
Many chains and local authorities will have scores that are not significantly different from average. Furthermore, care should be taken when comparing results between chains or between local authorities as small differences are unlikely to be significant. As a rule of thumb:

- if the confidence intervals for one chain overlap with the score of another chain, then they are not significantly different from each other;

- if the confidence intervals of one chain overlap the confidence intervals of another (but does not overlap the score itself), then the two scores are *unlikely* to be significantly different from each other;

- if the confidence intervals of one chain do not overlap the confidence intervals of another, then they are significantly different from each other.[15]

How does the context data help?

Whilst the methodology is designed to provide a fair comparison between chains or between local authorities in terms of the performance of their schools, the measures cannot fully summarise the circumstances and characteristics that sit behind those results.

The purpose of providing contextual data is to help users understand the pattern of results by setting out the characteristics of the schools and pupils within each chain or local authority in the same way that contextual information is provided in the performance tables.

Examples of how the contextual data can help users understand the pattern of results include:

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[15] Note that this is not a necessary condition. Situations where there is overlap of confidence intervals but the results are significantly different from each other are possible.

- identifying cases where a chain had only recently formed and the full effect of its performance might not yet be known;

- comparing chains or local authorities that have similar levels of disadvantage or low attainment on entry;

- benchmarking against chains or local authorities that have a similar size;

- highlighting where the results do not refer to all schools within a chain or local authority (for example if they have new provision academies); and

- being able to see how many schools in a local authority are already academies and consider how this might affect headline results (e.g. have some of the high performing schools already become converter academies or have under performing schools become sponsored academies?)

How should users interpret the improvement measure alongside the current value added measure?

There are two aspects to measures of performance within academy chains and local authorities – current value added and improvement in value added. Whilst these scores are understandably correlated, it is possible for a chain or local authority to have a high score on one measure and a low score on the other. *Figure 6.2* below sets out how this might be interpreted.

Figure 6.2: Interpreting a combination of improvement and current value added measures

Low improvement / High current

Chains and LAs in this section are not improving as quickly as others but overall performance is high.

This may include those that have driven improvements in the past (prior to the baseline year) and are now maintaining that higher performance.

High improvement / High current

Chains and LAs in this section are improving more quickly than others and also have high overall performance.

Current VA score

Improvement score

Low improvement / Low current

Chains and LAs in this section are not improving as quickly as others and overall performance remains low.

This may include cases of sustained underperformance but could also reflect cases where changes have taken place but have not had time to take full effect.

High improvement / Low current

Chains and LAs in this section are improving more quickly than others but overall performance remains low.

This may include cases where chains and LAs are tackling historic underperformance and have driven improvements yet performance remains below average.

Summary and questions

The two proposed measures capture the current performance of schools within academy chains and local authorities and how this has changed over time. The current value added

measure is presented in the same form that has been used in performance tables for schools for a number of years (i.e. a score centred around 1000 for key stage 4). The improvement measures have been designed so that they can be interpreted in terms of GCSE and equivalent points.

Recognising the uncertainty around value added measures, the new measures include confidence intervals to aid interpretation and reduce the risk of spurious conclusions.

Contextual data is provided to help users understand the pattern of results by setting out the characteristics of the schools and pupils within each chain or local authority in the same way that contextual information is provided in the performance tables.

- Are the proposed contextual data useful? What else should be considered?
- Are the proposed measures easy to interpret?

7. Conclusion

This Statistical Working Paper has set out current thinking on how the Department for Education might assess the performance of schools in individual academy chains and local authorities through two measures.

The first measure captures the current performance within academy chains and local authorities by taking an average of the current value added in each relevant school. This measure will recognise those chains and local authorities that have historically driven improvements in performance that are now maintaining that higher level. It also means that the performance of new schools that do not have historic performance data is also recognised.

The second measure captures the relative improvement in the performance of the schools in a chain or local authority over time. It does this by exploring changes in value added measures across years in comparison to schools with a similar starting point. The performance of each school is compared to other schools that started, based on estimates of value added, at a similar level of effectiveness.

As well as setting out the arguments in favour of these measures, this paper discusses some of the inherent weaknesses. Value added provides a fairer comparison than simple aggregates of performance as it controls for pupil intakes. However, measures of value added are estimates with a degree of uncertainty which should be recognised in measures derived from them, particularly when looking at changes over time. The nature of value added means that two schools with the same score can have very different characteristics which may affect rates of improvement. To aid interpretation of the scores, these new measures sit alongside a range of contextual information, covering the number of schools included, the types of school and the average levels of disadvantage, special educational needs and prior attainment.

No measure can fully capture the range of individual circumstances in every school, academy chain or local authority or the full breadth of their activity. However, the department believes that this is a useful base from which to raise the debate around the relative performance of schools within academy chains and local authorities.

The department invites readers to provide views on the working methodology, including any suggestions for alternative approaches. Please direct all comments and queries to the following email address: infrastructure.statistics@education.gsi.gov.uk

8. Contextual data, current value added scores and improvement in value added scores within academy chains and local authorities 2014

This section presents data for chains and local authorities with at least five schools at key stage 4. This includes contextual information and the proposed performance measures. Guidance on interpreting these outputs is provided in section 6.

As the products of a new methodology that requires further testing, it is important to note that, these statistics should be approached with some caution. Readers should note in particular the limitations acknowledged throughout this paper.

Academy chains and local authorities have very different roles and responsibilities and, as a result, they are not directly comparable. Therefore, academy chain results should only be considered in relation to other academy chains, and similarly local authority results should only be compared with other authorities.

Figure 8.1 Academy chains at key stage 4[1,2,3]

| Chain name | Number of schools with year 11 (4) | Number of pupils in key stage 4 cohort | Number of academies included in current key stage 4 value added measure (3,4,5) | | | | | | | | | Characteristics of key stage 4 cohort (2) | | | | Performance measures(7) | | | |
| | | | Type of academy | | | | Length of time open (6) | | | | | | | | | | | | |
			Total	Converter academies	Sponsored academies	Free schools, UTCs and studio schools	1 year	2 years	3 years	4 years	5 or more years	KS2 average point score on entry	% disadvantaged	% SEN statemented or at School Action+	% English as an additional language	Current GCSE and equivalent value added	Improvement in GCSE and equivalent value added	Current GCSE only value added	Improvement in GCSE only value added
Academies Enterprise Trust (AET)	33	5739	33	4	28	1	9	10	7	3	4	26.6	38	9	13	**990.3** (+/- 1.9)	**-0.2** (+/- 2.8)	**983.8** (+/- 2.1)	**+0.8** (+/- 3.0)
Academy Transformation Trust	9	1514	9	3	6	0	9	0	0	0	0	26.7	31	13	9	**980.2** (+/- 3.8)	**-4.0** (+/- 5.4)	**971.3** (+/- 4.2)	**-4.8** (+/- 5.9)
ARK Schools	16	1376	11	2	9	0	2	2	0	0	7	26.8	52	14	29	**1023.3** (+/- 4.0)	**+24.7** (+/- 5.8)	**1027.2** (+/- 4.4)	**+20.7** (+/- 6.4)
Cabot Learning Federation	6	745	6	0	6	0	0	1	2	0	3	26.6	38	7	15	**997.9** (+/- 5.5)	**+5.0** (+/- 7.7)	**993.8** (+/- 6.0)	**+3.9** (+/- 8.5)
CfBT Education Trust	9	1579	8	5	3	0	1	5	1	0	1	26.7	25	9	15	**980.9** (+/- 3.8)	**-12.6** (+/- 5.3)	**984.2** (+/- 4.1)	**-4.6** (+/- 5.8)
Creative Education Academies Trust (CEAT)	6	897	6	1	5	0	3	1	2	0	0	26.9	30	8	10	**993.9** (+/- 4.9)	**-9.2** (+/- 6.9)	**975.0** (+/- 5.4)	**+4.6** (+/- 7.6)
David Ross Education Trust (DRET)	7	923	7	3	4	0	2	2	1	1	1	27.2	31	7	11	**986.1** (+/- 4.9)	**-2.2** (+/- 6.9)	**979.7** (+/- 5.4)	**-1.6** (+/- 7.6)
Diocese of Westminster Academy Trust, The	6	1167	6	6	0	0	0	6	0	0	0	28.5	18	5	27	**1014.6** (+/- 4.3)	**+9.2** (+/- 6.1)	**1023.4** (+/- 4.7)	**+6.1** (+/- 6.7)
Diverse Academies Trust	5	967	5	3	2	0	2	1	2	0	0	28.1	20	3	1	**992.2** (+/- 4.7)	**-6.3** (+/- 6.6)	**986.0** (+/- 5.1)	**-5.9** (+/- 7.2)
E-ACT	21	2667	20	0	20	0	0	8	1	4	7	26.1	48	7	28	**995.7** (+/- 2.9)	**+0.6** (+/- 4.1)	**989.2** (+/- 3.2)	**+0.1** (+/- 4.5)
Greenwood Dale Foundation Trust	8	1467	7	0	7	0	2	2	1	1	1	26.2	39	4	21	**982.1** (+/- 3.9)	**-19.9** (+/- 5.5)	**953.8** (+/- 4.3)	**-10.2** (+/- 6.0)
Harris Federation	16	2245	15	2	13	0	2	2	2	0	9	27.2	45	8	29	**1022.7** (+/- 3.2)	**+11.3** (+/- 4.6)	**1027.0** (+/- 3.5)	**+18.2** (+/- 5.1)
Kemnal Academy Trust, The (TKAT)	14	2422	14	11	3	0	2	4	7	1	0	26.8	29	11	7	**995.8** (+/- 3.0)	**+4.5** (+/- 4.2)	**997.6** (+/- 3.3)	**+7.1** (+/- 4.7)
Oasis Community Learning	15	2041	14	0	14	0	2	0	0	1	11	26.3	50	13	22	**985.4** (+/- 3.3)	**+2.2** (+/- 4.6)	**974.3** (+/- 3.6)	**+3.8** (+/- 5.1)

Chain name	Number of schools with year 11 (4)	Number of pupils in key stage 4 cohort	Number of academies included in current key stage 4 value added measure (3,4,5)									Characteristics of key stage 4 cohort (2)				Performance measures(7)							
			Type of academy				Length of time open (6)																
			Total	Converter academies	Sponsored academies	Free schools, UTCs and studio schools	1 year	2 years	3 years	4 years	5 or more years	KS2 average point score on entry	% disadvantaged	% SEN statemented or at School Action+	% English as an additional language	Current GCSE and equivalent value added		Improvement in GCSE and equivalent value added		Current GCSE only value added		Improvement in GCSE only value added	
Ormiston Academies Trust	18	2825	18	1	17	0	2	3	4	4	5	26.7	41	8	9	**988.4**	(+/- 2.7)	**-3.5**	(+/- 4.0)	**972.6**	(+/- 3.0)	**+1.2**	(+/- 4.4)
Outwood Grange Academies Trust	7	1441	7	1	6	0	2	2	1	0	2	27.2	31	6	8	**1010.3**	(+/- 3.8)	**+8.5**	(+/- 5.4)	**987.1**	(+/- 4.2)	**+11.7**	(+/- 6.0)
School Partnership Trust Academies (SPTA)	14	2016	14	6	8	0	2	3	7	0	2	27.1	36	8	5	**971.3**	(+/- 3.2)	**-13.5**	(+/- 4.6)	**955.4**	(+/- 3.6)	**-1.7**	(+/- 5.0)
UCAT	6	783	6	1	5	0	2	2	1	0	1	26.8	47	10	6	**958.4**	(+/- 5.3)	**-20.6**	(+/- 7.4)	**928.2**	(+/- 5.8)	**-27.4**	(+/- 8.2)
United Learning	22	3345	21	0	21	0	3	1	0	0	17	26.3	43	11	23	**1007.5**	(+/- 2.6)	**+12.2**	(+/- 3.6)	**992.1**	(+/- 2.8)	**+8.5**	(+/- 4.0)
Woodard Academies Trust	5	919	5	0	5	0	1	0	2	0	2	27.4	25	9	10	**983.4**	(+/- 5.0)	**NA**	NA	**983.6**	(+/- 5.5)	**NA**	NA

1. School types and characteristics information as published in the 2014 secondary school performance tables.

2. State-funded mainstream schools only. Special schools and pupil referral units/alternative provision academies/alternative provision free schools are not included.

3. Groups with fewer than 5 schools with eligible pupils at the end of the key stage are not included in this table. In some instances improvement scores may be listed as not applicable where fewer than 5 schools in a group have sufficient historical data to produce an improvement score.

4. Schools are assigned to the academy chain or local authority they were under as at 11 September 2013. Schools that opened after this date but had results in 2014 - e.g. schools that have become sponsored or converter academies - are included as their predecessor school under the appropriate academy chain or local authority. 5. Not all schools that are able to teach pupils at the end of key stage 4 necessarily did so in 2014. For example the school may be growing from the lower ages upwards and not yet have pupils at the end of key stage 4.

6. Length of time open is typically based on the number of complete academic years between the opening date of the school as recorded on Edubase and 31 August 2014. Where no opening date exists it is assumed they have been open for 5 or more years.

7. Academy chain and local authority measures are derived from historic school level value added scores. These are calculated from underlying pupil level data on a consistent basis using the 2014 value added methodology. Therefore historic scores may not match those published in performance tables.

Figure 8.2 Local authorities at key stage 4[1,2,3]

Chain name	Number of schools with year 11 (4)	Number of pupils in key stage 4 cohort	Number of schools with key stage 4 in local area (4)					Number of LA maintained schools included in current key stage 4 value added measure (3,4,5)					Characteristics of key stage 4 cohort (2)				Performance measures (6)							
			Total	LA maintained mainstream	Converter academies	Sponsored academies	Free schools, UTCs and studio schools	Total	Community schools	Foundation schools	Voluntary aided schools	Voluntary controlled schools	KS2 average point score on entry	% disadvantaged	% SEN statemented or at School Action+	% English as an additional language	Current GCSE and equivalent value added		Improvement in GCSE and equivalent value added		Current GCSE only value added		Improvement in GCSE only value added	
Barking and Dagenham	9	2110	10	9	0	0	1	9	7	0	1	1	27.4	42	7	33	1000.1	(+/- 3.2)	-0.1	(+/- 4.6)	996.2	(+/- 3.6)	-5.6	(+/- 5.1)
Barnet	7	799	24	7	13	2	2	6	1	0	5	0	27.7	30	14	36	1027.2	(+/- 5.4)	+24.4	(+/- 7.6)	1038.1	(+/- 5.9)	+22.2	(+/- 8.3)
Barnsley	9	2213	10	9	0	1	0	9	7	0	1	1	27.2	30	7	2	978.1	(+/- 3.1)	-11.2	(+/- 4.3)	966.8	(+/- 3.4)	-11.5	(+/- 4.8)
Birmingham	38	5994	83	38	29	10	6	37	17	9	11	0	27.3	50	8	40	1001.5	(+/- 1.9)	-3.0	(+/- 2.7)	1001.5	(+/- 2.1)	+0.7	(+/- 2.9)
Blackburn with Darwen	7	1261	11	7	1	1	2	7	3	1	3	0	27.2	35	6	40	1004.3	(+/- 4.1)	-5.0	(+/- 5.8)	1001.7	(+/- 4.5)	-4.6	(+/- 6.4)
Blackpool	6	1042	8	6	1	1	0	6	2	2	2	0	27.4	39	7	4	966.3	(+/- 4.5)	-22.6	(+/- 6.4)	955.8	(+/- 5.0)	-13.6	(+/- 7.0)
Bolton	14	2986	17	14	0	3	0	14	7	0	6	1	28.1	29	4	17	995.7	(+/- 2.7)	-1.3	(+/- 3.8)	998.9	(+/- 2.9)	+4.4	(+/- 4.1)
Bracknell Forest	5	1005	6	5	1	0	0	5	5	0	0	0	27.6	16	6	9	1004.8	(+/- 4.6)	+9.5	(+/- 6.5)	1000.5	(+/- 5.1)	+2.2	(+/- 7.2)
Bradford	16	3504	33	16	5	7	5	16	4	7	5	0	27	37	9	24	978.2	(+/- 2.5)	-12.2	(+/- 3.5)	968.3	(+/- 2.7)	-7.7	(+/- 3.9)
Brighton and Hove	7	1966	10	7	0	2	1	7	6	0	1	0	28.2	25	10	8	994.8	(+/- 3.3)	-4.5	(+/- 4.7)	998.5	(+/- 3.7)	-1.8	(+/- 5.2)
Bristol City of	5	924	21	5	5	10	1	5	1	2	2	0	27.4	27	4	13	995.5	(+/- 4.9)	+1.1	(+/- 6.9)	996.2	(+/- 5.3)	+4.2	(+/- 7.6)
Buckinghamshire	9	1467	36	9	22	3	2	9	4	4	1	0	27.8	18	7	17	993.0	(+/- 3.9)	-6.8	(+/- 5.5)	992.7	(+/- 4.2)	-9.9	(+/- 6.0)
Bury	14	2108	14	14	0	0	0	14	10	0	4	0	28.2	24	8	12	1004.5	(+/- 3.2)	+1.4	(+/- 4.5)	1010.1	(+/- 3.5)	-1.6	(+/- 4.9)

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			Total	LA maintained mainstream	Converter academies	Sponsored academies	Free schools, UTCs and studio schools	Total	Community schools	Foundation schools	Voluntary aided schools	Voluntary controlled schools	KS2 average point score on entry	% disadvantaged	% SEN statemented or at School Action+	% English as an additional language	Current GCSE and equivalent value added		Improvement in GCSE and equivalent value added		Current GCSE only value added		Improvement in GCSE only value added	
Calderdale	6	1034	13	6	6	1	0	6	3	3	0	0	27	33	7	23	999.7	(+/- 4.5)	+6.4	(+/- 6.4)	989.3	(+/- 5.0)	+0.8	(+/- 7.1)
Camden	9	1372	10	9	0	1	0	9	5	0	4	0	27.8	56	9	50	1008.2	(+/- 4.0)	+8.3	(+/- 5.7)	1017.0	(+/- 4.4)	+7.2	(+/- 6.2)
Cheshire East	8	1420	21	8	10	2	1	8	4	4	0	0	28.3	17	10	4	993.4	(+/- 3.9)	-3.6	(+/- 5.5)	996.0	(+/- 4.2)	-3.3	(+/- 6.0)
Cheshire West and Chester	10	1950	19	10	6	3	0	10	2	5	3	0	28.3	18	6	4	1002.7	(+/- 3.3)	-0.6	(+/- 4.7)	1003.6	(+/- 3.7)	-8.1	(+/- 5.2)
Cornwall	16	2529	32	16	15	0	1	16	5	11	0	0	27.8	24	8	1	991.1	(+/- 2.9)	-4.9	(+/- 4.1)	995.4	(+/- 3.2)	-2.5	(+/- 4.5)
Coventry	9	1446	19	9	8	2	0	9	2	4	3	0	26.7	38	13	29	998.9	(+/- 4.0)	+7.3	(+/- 5.6)	991.3	(+/- 4.4)	+6.1	(+/- 6.2)
Croydon	8	1224	21	8	5	8	0	8	0	2	6	0	27.4	31	9	28	1006.7	(+/- 4.3)	+2.5	(+/- 6.1)	1021.5	(+/- 4.7)	+7.9	(+/- 6.7)
Cumbria	20	2687	37	20	13	4	0	20	11	4	4	1	27.8	21	5	2	994.2	(+/- 2.8)	-1.6	(+/- 4.0)	996.3	(+/- 3.1)	+0.4	(+/- 4.4)
Derby	6	1123	15	6	5	3	1	6	1	5	0	0	26.8	32	7	28	993.2	(+/- 4.4)	-7.3	(+/- 6.2)	993.7	(+/- 4.8)	-4.2	(+/- 6.8)
Derbyshire	31	5474	45	31	12	2	0	31	21	5	2	3	28	23	8	1	982.2	(+/- 2.0)	-6.7	(+/- 2.8)	979.8	(+/- 2.2)	-6.1	(+/- 3.0)
Devon	17	3267	39	17	18	2	2	17	7	8	1	1	27.5	23	8	2	1002.9	(+/- 2.6)	+7.3	(+/- 3.6)	1009.0	(+/- 2.8)	+5.4	(+/- 4.0)
Dorset	14	2736	21	14	5	1	1	14	5	3	1	5	28.1	16	9	2	996.7	(+/- 2.8)	-5.9	(+/- 3.9)	1010.3	(+/- 3.1)	-1.8	(+/- 4.3)
Dudley	13	2233	20	13	7	0	0	13	5	6	2	0	27.6	29	8	7	994.6	(+/- 3.1)	-4.9	(+/- 4.3)	993.5	(+/- 3.4)	-6.0	(+/- 4.8)
Durham	18	2576	33	18	12	2	1	18	13	3	2	0	28	35	9	1	992.0	(+/- 2.8)	-4.4	(+/- 4.0)	980.3	(+/- 3.1)	-5.0	(+/- 4.4)
Ealing	9	2063	14	9	3	1	1	9	3	5	1	0	27.1	39	8	54	1022.2	(+/- 3.4)	+10.7	(+/- 4.7)	1034.5	(+/- 3.7)	+12.9	(+/- 5.2)

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East Riding of Yorkshire	13	2617	19	13	5	0	1	13	12	0	0	1	27.9	17	6	1	994.6	(+/- 2.8)	-6.0	(+/- 4.0)	996.3	(+/- 3.1)	-6.3	(+/- 4.4)
East Sussex	13	2454	28	13	9	4	2	13	11	0	2	0	27.9	18	6	3	1007.8	(+/- 2.9)	+4.7	(+/- 4.2)	1014.1	(+/- 3.2)	+7.4	(+/- 4.6)
Enfield	12	2535	20	12	2	4	2	12	7	1	4	0	28	33	8	36	1019.5	(+/- 2.9)	+15.2	(+/- 4.1)	1028.1	(+/- 3.2)	+11.8	(+/- 4.6)
Essex	14	2648	77	14	49	11	3	14	3	7	3	1	27.4	22	7	5	995.7	(+/- 2.8)	-2.2	(+/- 4.0)	999.2	(+/- 3.1)	-1.1	(+/- 4.4)
Gloucestershire	7	1116	39	7	27	5	0	7	1	6	0	0	27.4	25	6	4	997.2	(+/- 4.4)	+8.1	(+/- 6.2)	996.4	(+/- 4.8)	+5.2	(+/- 6.8)
Greenwich	9	1625	14	9	1	2	2	9	5	0	3	1	27.2	46	12	35	1025.7	(+/- 3.7)	+23.8	(+/- 5.2)	1025.5	(+/- 4.1)	+14.8	(+/- 5.8)
Hackney	7	820	14	7	1	5	1	7	2	0	5	0	26.2	45	12	46	1036.5	(+/- 5.3)	+30.1	(+/- 7.5)	1049.7	(+/- 5.8)	+27.3	(+/- 8.2)
Hampshire	41	7295	70	41	24	5	0	41	33	7	1	0	28.1	18	5	5	993.9	(+/- 1.7)	-5.2	(+/- 2.4)	1000.4	(+/- 1.9)	-1.8	(+/- 2.7)
Haringey	6	1395	11	6	4	1	0	6	5	1	0	0	27.2	50	10	50	1026.5	(+/- 4.0)	+18.5	(+/- 5.7)	1033.5	(+/- 4.4)	+21.4	(+/- 6.2)
Havering	5	834	18	5	12	1	0	5	1	4	0	0	27.5	24	5	9	1000.0	(+/- 5.1)	+5.7	(+/- 7.1)	1014.9	(+/- 5.6)	+8.9	(+/- 7.9)
Herefordshire	6	774	16	6	7	2	1	6	4	0	2	0	28.1	14	9	5	1012.9	(+/- 5.3)	+9.9	(+/- 7.5)	1014.8	(+/- 5.8)	+11.2	(+/- 8.2)
Hertfordshire	23	3680	79	23	48	4	4	23	14	6	3	0	28	20	7	7	996.5	(+/- 2.4)	-1.4	(+/- 3.4)	996.2	(+/- 2.6)	-2.5	(+/- 3.7)
Islington	8	1115	10	8	0	2	0	8	4	1	3	0	27.1	68	7	56	1024.0	(+/- 4.5)	+17.7	(+/- 6.3)	1033.5	(+/- 4.9)	+17.5	(+/- 7.0)
Kent	34	5318	100	34	43	20	3	34	6	18	8	2	27.9	19	10	7	1003.2	(+/- 2.0)	-0.3	(+/- 2.8)	1000.7	(+/- 2.2)	-1.5	(+/- 3.1)
Kingston upon Hull City of	7	1320	15	7	2	4	2	7	3	3	1	0	27.4	32	5	12	993.4	(+/- 4.1)	+7.4	(+/- 5.7)	976.0	(+/- 4.5)	+4.6	(+/- 6.3)

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Kirklees	14	2524	26	14	10	1	1	14	7	4	2	1	27.5	28	8	15	997.6	(+/- 2.9)	+4.6	(+/- 4.1)	998.6	(+/- 3.2)	+3.8	(+/- 4.5)
Lambeth	8	979	16	8	4	3	1	8	2	1	4	1	27.4	51	13	41	1019.8	(+/- 4.8)	+14.1	(+/- 6.7)	1022.5	(+/- 5.2)	+12.6	(+/- 7.4)
Lancashire	62	9254	84	62	17	3	2	62	29	8	23	2	27.8	24	6	9	995.5	(+/- 1.5)	-2.6	(+/- 2.1)	994.6	(+/- 1.7)	-2.0	(+/- 2.3)
Leeds	22	4300	39	22	9	7	1	22	9	10	3	0	27.2	31	9	12	989.3	(+/- 2.2)	-3.3	(+/- 3.1)	979.8	(+/- 2.4)	-4.8	(+/- 3.5)
Leicester	17	3139	18	17	0	1	0	17	10	3	4	0	27.1	38	8	47	1005.2	(+/- 2.7)	+0.1	(+/- 3.8)	1009.9	(+/- 2.9)	+0.8	(+/- 4.1)
Lewisham	11	1633	14	11	0	3	0	10	6	0	4	0	27	46	9	30	999.7	(+/- 3.8)	-2.0	(+/- 5.3)	1006.4	(+/- 4.1)	-6.8	(+/- 5.8)
Lincolnshire	10	1253	54	10	34	10	0	10	4	6	0	0	28.2	21	8	3	991.8	(+/- 4.1)	-10.7	(+/- 5.9)	990.3	(+/- 4.6)	-7.1	(+/- 6.4)
Liverpool	16	2654	32	16	6	8	2	16	5	2	9	0	27.7	42	11	7	982.8	(+/- 2.8)	-10.0	(+/- 4.0)	975.3	(+/- 3.1)	-4.1	(+/- 4.4)
Luton	7	1363	13	7	3	2	1	7	3	3	1	0	27.1	31	8	32	1006.7	(+/- 4.0)	+6.5	(+/- 5.7)	1013.9	(+/- 4.4)	+7.9	(+/- 6.2)
Manchester	12	2528	26	12	4	10	0	12	4	3	5	0	26.9	55	10	35	1002.9	(+/- 3.0)	+10.7	(+/- 4.2)	998.4	(+/- 3.3)	+10.6	(+/- 4.6)
Merton	5	1081	8	5	0	3	0	5	2	0	2	1	27.8	28	7	31	1031.1	(+/- 4.5)	+25.8	(+/- 6.4)	1034.9	(+/- 5.0)	+17.1	(+/- 7.0)
Newcastle upon Tyne	5	916	11	5	5	1	0	5	4	1	0	0	27.6	42	13	9	969.3	(+/- 4.8)	-13.0	(+/- 6.8)	948.3	(+/- 5.3)	-10.0	(+/- 7.5)
Newham	13	2968	18	13	2	1	2	13	10	1	2	0	26.7	59	8	67	1014.6	(+/- 2.8)	+7.7	(+/- 4.0)	1024.3	(+/- 3.1)	+2.8	(+/- 4.4)
Norfolk	27	4461	51	27	15	9	0	27	18	6	2	1	27.4	23	8	4	1000.2	(+/- 2.2)	+1.4	(+/- 3.1)	1010.9	(+/- 2.4)	+5.5	(+/- 3.4)
North Tyneside	10	1792	12	10	1	1	0	10	1	9	0	0	27.9	28	10	2	999.9	(+/- 3.4)	-1.9	(+/- 4.8)	993.7	(+/- 3.8)	-2.3	(+/- 5.3)

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North Yorkshire	33	5042	41	33	8	0	0	33	26	1	5	1	28.2	16	5	2	1002.5	(+/- 2.0)	+1.6	(+/- 2.9)	1005.2	(+/- 2.3)	+0.6	(+/- 3.2)
Northamptonshire	5	1148	41	5	18	15	3	5	2	2	1	0	28	16	5	9	1001.6	(+/- 4.3)	-1.3	(+/- 6.1)	1013.7	(+/- 4.7)	+3.0	(+/- 6.7)
Northumberland	11	2270	16	11	3	2	0	11	8	2	1	0	27.6	22	7	2	996.5	(+/- 3.0)	-6.1	(+/- 4.3)	995.4	(+/- 3.3)	-3.8	(+/- 4.7)
Nottinghamshire	8	1339	45	8	23	14	0	8	4	2	2	0	28	22	5	4	993.7	(+/- 4.0)	+2.9	(+/- 5.6)	987.0	(+/- 4.4)	+2.7	(+/- 6.2)
Oldham	6	1622	13	6	3	3	1	6	1	4	1	0	28	28	4	20	981.8	(+/- 3.6)	-17.1	(+/- 5.1)	968.7	(+/- 4.0)	-13.3	(+/- 5.6)
Oxfordshire	13	2021	36	13	17	4	2	13	11	1	1	0	27.8	17	9	5	1003.9	(+/- 3.2)	+4.8	(+/- 4.6)	1014.7	(+/- 3.6)	+6.5	(+/- 5.0)
Portsmouth	8	1447	10	8	0	2	0	8	5	2	1	0	27.3	28	10	9	993.9	(+/- 3.8)	+4.1	(+/- 5.4)	997.0	(+/- 4.2)	+8.3	(+/- 5.9)
Redbridge	13	2624	18	13	3	2	0	13	10	1	2	0	28.3	27	8	56	1019.9	(+/- 2.9)	+1.7	(+/- 4.1)	1027.0	(+/- 3.2)	-7.8	(+/- 4.5)
Redcar and Cleveland	6	883	11	6	3	2	0	6	1	3	2	0	28.5	25	19	1	971.6	(+/- 4.9)	-23.8	(+/- 6.9)	975.7	(+/- 5.3)	-16.0	(+/- 7.6)
Rochdale	9	1782	12	9	2	1	0	9	5	1	3	0	27.4	39	9	27	993.8	(+/- 3.5)	-5.4	(+/- 4.9)	994.1	(+/- 3.8)	-3.6	(+/- 5.4)
Rotherham	10	2052	16	10	5	1	0	10	8	1	1	0	27	31	6	9	1003.0	(+/- 3.2)	+8.2	(+/- 4.5)	986.9	(+/- 3.5)	-2.2	(+/- 5.0)
Salford	10	1514	15	10	2	3	0	10	6	0	4	0	27.7	34	5	8	987.0	(+/- 3.8)	-13.1	(+/- 5.3)	981.5	(+/- 4.1)	-6.7	(+/- 5.8)
Sandwell	6	1248	17	6	3	8	0	6	2	2	1	1	26.3	41	8	24	987.3	(+/- 4.2)	-3.9	(+/- 5.9)	977.0	(+/- 4.6)	+0.1	(+/- 6.5)
Sefton	11	1781	19	11	7	0	1	11	2	2	7	0	28	33	10	3	992.5	(+/- 3.4)	-6.2	(+/- 4.9)	985.1	(+/- 3.8)	-3.8	(+/- 5.4)
Sheffield	10	2318	26	10	10	5	1	10	6	4	0	0	27.7	24	6	7	989.6	(+/- 3.0)	-1.7	(+/- 4.3)	993.1	(+/- 3.3)	+2.4	(+/- 4.7)

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Shropshire	12	1774	21	12	8	1	0	12	9	0	0	3	27.8	18	7	2	**997.9**	(+/- 3.5)	**-4.8**	(+/- 4.9)	**1000.4**	(+/- 3.8)	**-4.1**	(+/- 5.4)
Somerset	8	1536	30	8	18	3	1	8	5	2	0	1	27.4	20	6	3	**989.6**	(+/- 3.7)	**-8.5**	(+/- 5.2)	**987.5**	(+/- 4.1)	**-9.7**	(+/- 5.8)
South Gloucestershire	8	1487	17	8	3	5	1	8	5	2	0	1	27.8	15	3	3	**984.3**	(+/- 3.7)	**-10.0**	(+/- 5.3)	**980.0**	(+/- 4.1)	**-7.9**	(+/- 5.8)
South Tyneside	7	1220	9	7	2	0	0	7	5	1	1	0	27.7	44	7	4	**992.5**	(+/- 4.1)	**-1.8**	(+/- 5.9)	**976.3**	(+/- 4.6)	**-1.7**	(+/- 6.4)
Southampton	8	1305	13	8	2	2	1	8	5	2	1	0	26.9	37	10	15	**994.4**	(+/- 4.1)	**-1.9**	(+/- 5.8)	**984.9**	(+/- 4.5)	**-3.0**	(+/- 6.3)
St. Helens	7	1376	9	7	0	2	0	7	3	1	3	0	28.6	27	6	1	**987.5**	(+/- 3.9)	**-10.9**	(+/- 5.5)	**975.5**	(+/- 4.3)	**-2.2**	(+/- 6.0)
Staffordshire	35	5683	56	35	13	6	2	35	23	7	4	1	28	20	6	4	**994.9**	(+/- 1.9)	**-4.1**	(+/- 2.7)	**994.7**	(+/- 2.1)	**-7.0**	(+/- 3.0)
Stockport	9	1996	14	9	3	1	1	9	6	0	3	0	28.3	19	9	6	**999.3**	(+/- 3.2)	**+2.4**	(+/- 4.6)	**1006.6**	(+/- 3.6)	**+2.4**	(+/- 5.1)
Stockton-on-Tees	7	1305	12	7	2	3	0	7	4	0	3	0	28.5	28	5	4	**982.3**	(+/- 4.0)	**-17.2**	(+/- 5.7)	**980.3**	(+/- 4.4)	**-17.7**	(+/- 6.2)
Stoke-on-Trent	5	811	16	5	3	6	2	5	1	3	1	0	27.7	32	9	10	**969.1**	(+/- 5.1)	**-18.0**	(+/- 7.3)	**961.3**	(+/- 5.6)	**-9.7**	(+/- 8.0)
Suffolk	13	2499	42	13	18	7	4	12	8	2	1	1	27.5	19	6	5	**997.5**	(+/- 2.9)	**-2.5**	(+/- 4.1)	**1009.7**	(+/- 3.2)	**+0.1**	(+/- 4.6)
Sunderland	6	1077	18	6	8	3	1	6	5	0	1	0	27.6	32	9	7	**988.7**	(+/- 4.4)	**-8.2**	(+/- 6.3)	**978.8**	(+/- 4.9)	**-3.2**	(+/- 6.9)
Surrey	26	5007	53	26	26	1	0	26	10	5	10	1	28.1	15	9	11	**1013.5**	(+/- 2.1)	**+12.5**	(+/- 3.0)	**1023.5**	(+/- 2.3)	**+13.1**	(+/- 3.2)
Tameside	8	1325	15	8	5	2	0	8	6	0	2	0	27.6	33	5	9	**999.9**	(+/- 4.0)	**+0.5**	(+/- 5.6)	**996.6**	(+/- 4.4)	**+6.2**	(+/- 6.2)
Telford and Wrekin	5	849	13	5	6	2	0	5	2	2	1	0	27.4	24	11	8	**986.7**	(+/- 5.0)	**-6.2**	(+/- 7.1)	**981.8**	(+/- 5.5)	**-10.3**	(+/- 7.8)

Chain name	Number of schools with year 11 (4)	Number of pupils in key stage 4 cohort	Number of schools with key stage 4 in local area (4)					Number of LA maintained schools included in current key stage 4 value added measure (3,4,5)					Characteristics of key stage 4 cohort (2)				Performance measures (6)							
			Total	LA maintained mainstream	Converter academies	Sponsored academies	Free schools, UTCs and studio schools	Total	Community schools	Foundation schools	Voluntary aided schools	Voluntary controlled schools	KS2 average point score on entry	% disadvantaged	% SEN statemented or at School Action+	% English as an additional language	Current GCSE and equivalent value added		Improvement in GCSE and equivalent value added		Current GCSE only value added		Improvement in GCSE only value added	
Tower Hamlets	14	2303	16	14	1	0	1	14	7	1	5	1	27.4	74	10	73	1013.8	(+/- 3.1)	+6.9	(+/- 4.3)	1022.6	(+/- 3.4)	+10.9	(+/- 4.8)
Trafford	6	782	18	6	12	0	0	6	1	3	2	0	27.9	34	10	21	1002.7	(+/- 5.2)	-2.5	(+/- 7.4)	1001.5	(+/- 5.8)	+1.1	(+/- 8.2)
Waltham Forest	11	1571	16	11	3	2	0	11	9	1	1	0	26.9	44	13	49	1021.9	(+/- 3.8)	+12.5	(+/- 5.4)	1036.0	(+/- 4.2)	+13.1	(+/- 5.9)
Warrington	5	1016	12	5	4	2	1	5	2	0	3	0	28.9	18	7	3	992.3	(+/- 4.5)	-10.4	(+/- 6.4)	998.1	(+/- 5.0)	-6.8	(+/- 7.1)
Warwickshire	12	2007	36	12	20	3	1	12	4	3	5	0	28.5	15	7	3	1009.7	(+/- 3.2)	+7.7	(+/- 4.6)	1012.7	(+/- 3.6)	+5.0	(+/- 5.0)
West Sussex	25	5534	38	25	6	6	1	25	15	1	7	2	28.1	14	9	7	1008.8	(+/- 2.0)	+6.2	(+/- 2.8)	1019.7	(+/- 2.2)	+6.7	(+/- 3.1)
Wigan	14	2694	20	14	3	1	2	14	6	3	5	0	28.3	23	9	3	993.0	(+/- 2.8)	-8.5	(+/- 3.9)	996.8	(+/- 3.1)	-2.1	(+/- 4.3)
Wiltshire	9	1295	29	9	17	3	0	9	3	4	2	0	27.1	19	8	4	994.7	(+/- 4.1)	+0.5	(+/- 5.7)	995.7	(+/- 4.5)	-4.7	(+/- 6.3)
Wirral	8	1168	22	8	12	2	0	8	4	3	1	0	27.1	40	13	3	975.2	(+/- 4.3)	-13.9	(+/- 6.0)	969.9	(+/- 4.7)	-18.7	(+/- 6.6)
Wolverhampton	10	1481	17	10	4	3	0	10	7	1	2	0	27.3	37	9	21	992.8	(+/- 3.8)	-14.3	(+/- 5.4)	985.7	(+/- 4.2)	-8.2	(+/- 5.9)
Worcestershire	10	2009	29	10	17	2	0	10	4	2	3	1	27.6	17	9	4	1009.1	(+/- 3.2)	+8.1	(+/- 4.6)	1013.2	(+/- 3.6)	+4.0	(+/- 5.0)
York	8	1337	10	8	2	0	0	8	6	0	1	1	28	18	5	4	1009.8	(+/- 4.0)	+6.3	(+/- 5.7)	1017.6	(+/- 4.4)	+5.4	(+/- 6.2)

1. School types and characteristics information as published in the 2014 secondary school performance tables.

2. State-funded mainstream schools only. Special schools and pupil referral units/alternative provision academies/alternative provision free schools are not included.

3. Groups with fewer than 5 schools with eligible pupils at the end of the key stage are not included in this table. In some instances improvement scores may be listed as not applicable where fewer than 5 schools in a group have sufficient historical data to produce an improvement score.

4. Schools are assigned to the academy chain or local authority they were under as at 11 September 2013. Schools that opened after this date but had results in 2014 - e.g. schools that have become sponsored or converter academies - are included as their predecessor school under the appropriate academy chain or local authority.

5. Not all schools that are able to teach pupils at the end of key stage 4 necessarily did so in 2014. For example the school may be growing from the lower ages upwards and not yet have pupils at the end of key stage 4.

6. Academy chain and local authority measures are derived from historic school level value added scores. These are calculated from underlying pupil level data on a consistent basis using the 2014 value added methodology. Therefore historic scores may not match those published in performance tables.

9. Value added baseline groups summary statistics

The proposed new improvement measure captures the change in school level value added scores between a baseline year and the current year in comparison to schools with similar value added in the baseline year. The baseline year is taken as the last year as the predecessor school (if applicable) or five years ago whichever is more recent.[16]

This section sets out the group averages and group standard deviations for each baseline year across the two improvement measures. *Figure 9.1* sets this out for the GCSE and equivalent measure and *figure 9.2* sets this out for the GCSE only measure.

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[16] This represents the usual duration of key stage 3 and key stage 4.

Figure 9.1 – Group averages and standard deviations for key stage 4 (GCSE and equivalent) value added improvement

	Average improvement by baseline year					Standard deviation by baseline year				
	2009	2010	2011	2012	2013	2009	2010	2011	2012	2013
Group 01 <964	+23.21	+19.95	+14.48	+10.13	+10.97	35.79	39.75	35.07	31.8	36.66
Group 02 >=964 to <973	+13.18	+15.07	+13.13	+13.81	+9.24	24.72	25.19	23.02	23.78	22.11
Group 03 >=973 to <979	+9.22	+6.86	+5.63	+4.27	+3.97	21.71	22.82	23.22	21.83	18.06
Group 04 >=979 to <985	+6.88	+6.61	+7.79	+6.82	+7.23	24.55	23.05	21.85	21.08	19.47
Group 05 >=985 to <991	+4.60	+2.62	+3.50	+4.89	+4.31	20.42	21.78	21.33	20.39	21.98
Group 06 >=991 to <997	+2.67	+0.44	+1.04	+1.49	+2.65	21.39	22.34	20.95	19.52	19.37
Group 07 >=997 to <1003	-2.56	-0.92	+0.07	-0.81	-0.16	21.56	18.77	19.62	21.43	19.89
Group 08 >=1003 to <1009	-1.46	-0.71	-2.85	-1.89	-1.79	17.32	18.57	22.21	22.04	21.28
Group 09 >=1009 to <1015	-6.48	-4.67	-3.24	-2.93	-3.70	18.17	18.22	20.63	20.46	21.5
Group 10 >=1015 to <1021	-6.67	-5.31	-5.47	-7.03	-5.98	17.98	19.71	19.71	22.8	20.07
Group 11 >=1021 to <1027	-7.81	-10.05	-9.90	-6.02	-4.99	20.44	21.32	19.9	20.85	22.42
Group 12 >=1027 to <1033	-7.02	-5.17	-7.32	-9.29	-10.57	17.75	17.52	22.92	23.34	26.18
Group 13 >=1033 to <1039	-12.20	-13.57	-10.92	-14.04	-10.21	19.57	22.13	19.93	24.81	21.66
Group 14 >=1039	-19.98	-18.66	-21.68	-20.25	-18.22	21.29	23.22	24.64	22.95	23.95

Figure 9.2 – Group averages and standard deviations for key stage 4 (GCSE only) value added improvement

	Average improvement by baseline year					Standard deviation by baseline year				
	2009	2010	2011	2012	2013	2009	2010	2011	2012	2013
Group 01 <964	+16.06	+26.40	+25.99	+23.77	+19.95	38.37	38	35.25	31.38	26.74
Group 02 >=964 to <973	+0.45	+5.94	+5.85	+11.53	+5.78	34.85	25.43	25.99	23.75	23.29
Group 03 >=973 to <979	+3.39	+5.73	+8.79	+9.82	+10.69	25.84	30.4	27.14	24.05	24.34
Group 04 >=979 to <985	-5.04	+4.89	+1.99	+6.23	+5.51	28.68	29.72	26.85	25.4	21.48
Group 05 >=985 to <991	-3.54	+0.31	+3.01	+0.95	+3.79	28.84	27.29	25.08	25.72	19.63
Group 06 >=991 to <997	-2.82	-0.22	-1.30	-0.40	+2.29	26.92	23.58	22.82	21.59	16.47
Group 07 >=997 to <1003	-4.35	-1.43	-0.86	-1.08	-2.60	25.01	21.68	22.48	19.99	16.98
Group 08 >=1003 to <1009	-6.21	-3.64	-2.49	-1.62	-1.76	22.56	23.26	20.78	18.09	16.84
Group 09 >=1009 to <1015	-7.21	-5.98	-5.31	-4.89	-6.15	22.68	19.83	20.02	19.13	17.93
Group 10 >=1015 to <1021	-5.98	-4.69	-7.72	-8.75	-5.90	18.79	16.94	17.25	17.96	15.13
Group 11 >=1021 to <1027	-8.28	-7.02	-9.06	-7.71	-6.51	17.87	16.47	16.3	16.41	15.42
Group 12 >=1027 to <1033	-9.82	-7.94	-7.27	-9.40	-6.53	17.87	15.39	16.9	15.24	14.62
Group 13 >=1033 to <1039	-8.75	-10.00	-11.03	-9.82	-7.77	22.53	21.36	14.72	14.53	12.65
Group 14 >=1039	-11.01	-10.03	-11.98	-12.91	-11.19	17.06	15.79	17.3	16.46	13.32

10. Where the numbers come from

We use data from the school performance tables	Much of the underlying data has been published at school level in the school performance tables. It has been necessary to recalculate historic measures of performance from pupil data to ensure that value added methodologies are consistent over time.

11. Essential points to note

The Department is seeking views on the working methodology	We would welcome your views on the possible methodology and presentation described in these experimental statistics. Please direct all comments and queries to the following email address: infrastructure.statistics@education.gsi.gov.uk.
Coverage of data – state-funded mainstream schools in England only	The new measures only reports information from state-funded mainstream schools in England. This is further restricted to schools that have results at key stage 4. Information for chains and local authorities is only published where they have five schools with data.

12. Where to go for further details

Attainment by school type at key stage 2	We publish data on National curriculum assessments at key stage 2 annually showing performance by school type.
Attainment by school type at key stage 4	We publish data on National curriculum assessments at key stage 4 annually showing performance by school type.

Outcomes at other key stages	We also publish information on attainment and outcomes for pupils by school type at [key stage 1](#) and at [A level and other level 3 qualifications](#).
Information on the governments reforms	Information on the reforms to [national assessments at key stage 2](#), [GCSE reforms](#) and [accountability reforms](#) is available from the DfE website.

13. Got a query? Like to give feedback?

If from the media	Press Office News Desk, Department for Education, Sanctuary Buildings, Great Smith Street, London SW1P 3BT. 020 7783 8300
If non-media	Jon Andrews, Department for Education, Sanctuary Buildings, Great Smith Street, London SW1P 3BT. Infrastructure.statistics@education.gsi.gov.uk

Department for Education

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This document is also available from our website at: GCSEs (Key Stage 4) statistics