

**Report: Suffolk
Schools
Reorganisation
Review – Data
Analysis**

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1 SUMMARY

The primary objective of Schools Reorganisation Review Proposals is to increase educational standards across the county.

Therefore, the decision whether or not to approve these proposals rests crucially on whether or not it has been demonstrated to a very high level of certainty that that the proposals will actually improve standards.

The major proposal is to move to a 2 tier education system county-wide with the associated closure of 40 Middle Schools, and disruption to 55% of learners in Suffolk. This is based on the assertion that the existing 3 tier system under performs the 2 tier system due solely to the difference in their structure. If this cannot be shown to be true to a convincingly high level of confidence then moving to 2 tier schools county-wide will not be justified on educational grounds.

Annex 3, Pupil Performance Research Findings Part 1 (April 2006), and Annex 5, Performance Research Findings Part 2 (October 2006) both contain data analyses and interpretations, which are fundamental to the proposal to move to a 2 tier system throughout Suffolk.

What the data actually show is that:

1. Differences in learners' attainment at all Key Stages including GCSEs is due to socio-economic variability in the schools' catchment area and is not due to the structure.
2. Contextual Value Added (CVA) scores, the DfES's preferred measure of school effectiveness, which account for external factors such as socio-economic factors show that 3 tier schools as a group have higher effectiveness scores than 2 tier schools as a group for the progression from KS2-KS4,
3. CVAs also show that 3 tier schools have similar effectiveness scores to 2 tier schools for the progression from KS1-KS2. However, there are some unresolved problems with CVAs for KS1 – KS2, which make this comparison uncertain.

These findings show that there is no educational justification for moving to a 2 tier system across Suffolk. It will be a very expensive, disruptive and long drawn out failure and will consume financial and staff resources which would be better employed in raising standards in the under performing schools across Suffolk whether in 2 or 3 tier structures.

The analysis below explains these findings.

2 SOCIO-ECONOMIC INDICATORS AND VARIABILITY

2.1 Basis of comparisons

The DfES states that 'It has, however, long been recognised that other external factors will affect the progress made by pupils – e.g. levels of deprivation'¹. Therefore, comparisons of the performance between two schools or two groups of schools **must** either:

1. show that the external factors are identical (or **very close** to identical) or
2. compensate for the external factors, e.g., by using the mathematical model in Ofsted's Contextual Value Added (CVA) calculation.

If either 1. or 2. cannot be achieved; then all comparisons will be invalid because the two groups will not be compared on a 'level playing field'.

Annex 3, Pupil Performance Research Findings Part 1, states that 'the socio-economic factors for 2 and 3 tier schools are broadly similar'² and on this basis asserts that direct comparisons are valid and can be made. The analysis in the following sections shows how socio-economic factors for 2 and 3 tier schools are **not similar enough to allow any valid comparisons** of KS tests or GCSE results.

2.2 Free School Meals

As stated in the Annex 3, Pupil Performance Research Findings Part 1, 'The proportion of learners taking up Free School Meals (FSM) has been used to give a proxy indicator of deprivation for many years.'³ Data used were the January 2006 PLASC. Before considering the 2 tier and 3 tier data comparison, it is informative to consider the overall pattern (chart 1).

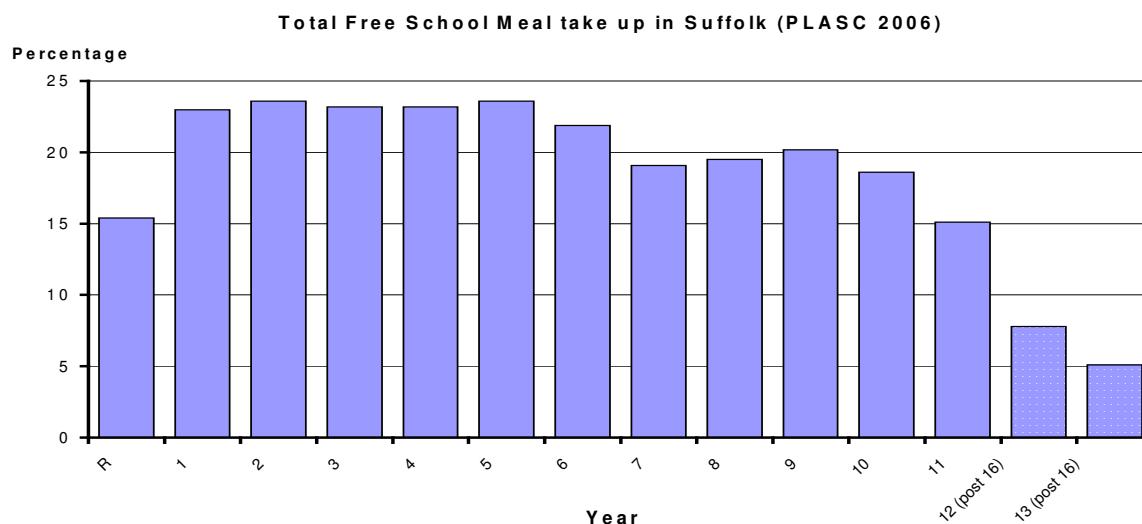


Chart 1

Year 12 and year 13 show abnormally low percentage take ups compared to all of

¹ www.dfes.gov.uk/performance/tables/pilots2_06/k5.shtml

² Section 2, paragraph 24, Page 8.

³ Section 2, paragraph 25, page 8.

the other years. So either;

1. in 2006, these years just happen to have low take ups or
2. perhaps more likely, since both of these years are post the 16 leaving age, some 50% of those eligible for FSM have already left school at age 16.

Leaving aside years 12 and 13, the minimum take up is about 15% and the maximum take up is 1.5 times this at about 23%.

The take up percentages vary from year to year. So taking FSM as a proxy indicator for deprivation, this means that the deprivation level of learners in Suffolk schools varies from year to year. Assuming that these percentage take up figures 'roll forward', then KS2 attainments across Suffolk for the next 5 years will be affected (downwards) by the higher percentage of FSM take ups seen in the current year 5 through to year 1. These will in turn feed through to KS3, KS 4 and GCSEs in due course.

Chart 2 below shows the same data but now arranged to show 2 tier and 3 tier take up.

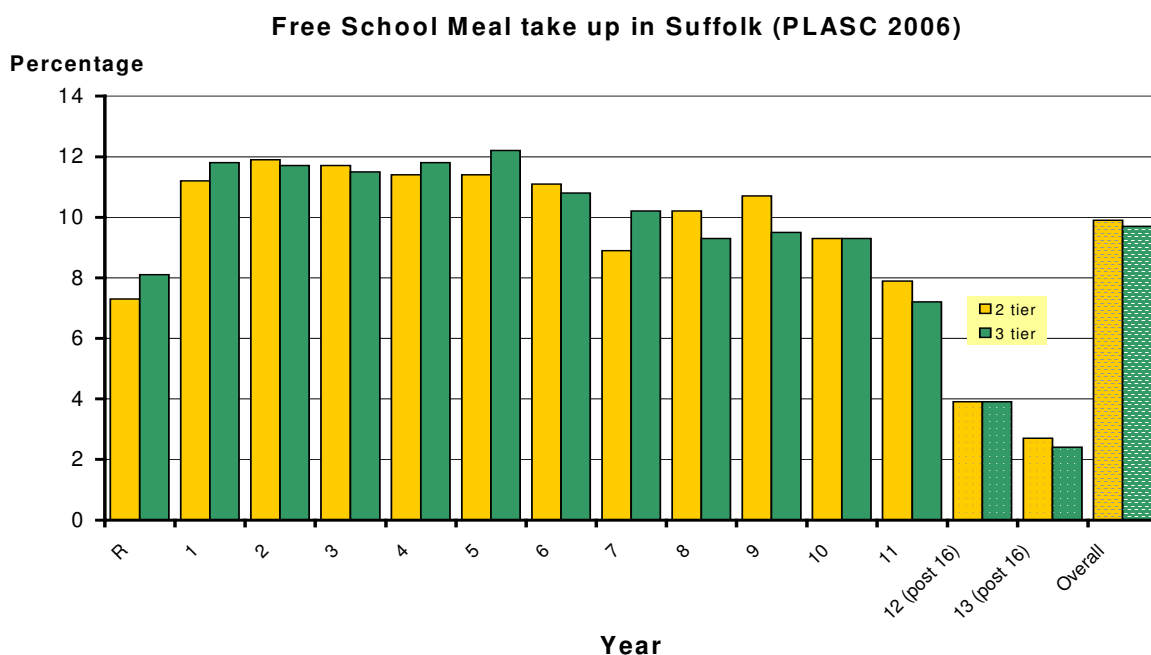


Chart 2

As can be seen from this chart, there are **differences between the percentage take up** in 2 tier and 3 tier schools.

Whether 2 tier or 3 tier schools have the higher percentage take up depends on which year you consider. So for example, looking at the KS2 (year 6) cohort for 2006, 2 tier schools have a 11.1% take up, whilst 3 tier schools have a 10.8% take up. It is interesting to note that because of the number of learners in each structure, this translates to approximately 330 learners taking FSM in 2 tier schools but some 500 learners taking FSM in 3 tier schools. Next year, when the year 5 cohort move up to be year 6, the KS2 percentage take up will reverse with 3 tier having a larger

percentage take up at 12.2% with the 2 tier percentage being 11.4%.

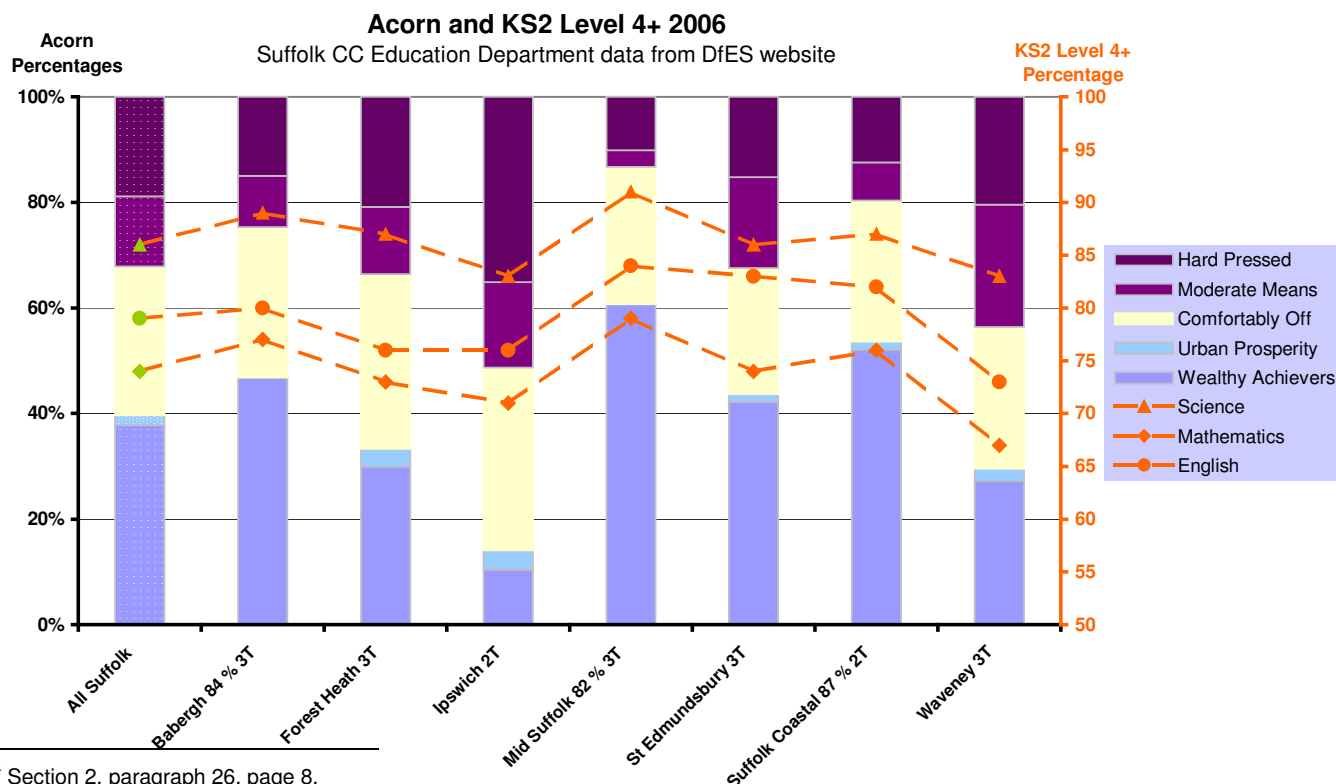
This chart also demonstrates why using averages e.g. the overall percentage take up, shown at the right hand side of the chart, is very misleading. This single number masks all of the detail, which actually describes what is happening.

Conclusion

1. the percentage take up of FSM **varies from year to year**, at both the total Suffolk level and also at the 2 tier / 3 tier split level;
2. **future learner attainments across Suffolk will be affected** (downwards) by the higher percentage take ups of FSM in the pipeline – in current year 5 through to year 1;
3. the percentage take up of **FSM does differ** between 2 tier schools and 3 tier schools, and
4. **averages are misleading and mask** what is actually going on.

2.3 ACORN data – learners’ postcodes

A more recent indicator of socio-economic factors is ACORN, which uses the postcode of individual eligible pupils’ address⁴ to categorise the socio-economic characteristics of that location. There are 5 categories: Hard Pressed, Moderate Means, Comfortably Off, Urban Prosperity and Wealthy Achievers. In a previous paper (Socio-economic Influence – KS2 and ACORN data), the influence of socio-economic differences (ACORN data) across Suffolk Districts for KS2 (2006) test results was analysed and discussed. For the purposes of this document, only the summary chart is reproduced below.



⁴ Section 2, paragraph 26, page 8.

Observations

1. KS2 data across all Districts track the variations in Hard Pressed plus Moderate Means. When these percentages increase, the KS2 performance decreases. When these percentages decrease, the KS2 performance increases.
2. KS2 data across all Districts track the variations in Wealthy Achievers and Urban Prosperity. Where these **percentages increase**, the **KS2 performance increases**. When these **percentages decrease**, the **KS2 performance decreases**.
3. Ipswich 2T and Waveney 3T are the two worst KS2 performing Districts **and** they have the least 'advantageous' Acorn percentages in Suffolk.
4. Mid Suffolk (82% 3T) is the top KS2 performing District **and** it has exceptionally high 'advantageous' Acorn percentages.
5. Other Districts regardless of whether they are 3T, dominated by 3T or dominated by 2T show the same tracking with Acorn percentages.

Conclusions

1. Differences in KS2 level 4+ performance **are not due to the Schools' Organisational Structure** – 2 tier or 3 tier.
2. Differences in KS2 level 4+ performance are **due to socio-economic variations** in the catchment District.
3. Differences in the performance results for older children for example, GCSE results will also be due to socio-economic variations in the catchment District and will show behaviour consistent with KS2 results.

3 CONTEXTUAL VALUE ADDED MEASURES OF PERFORMANCE

3.1 The Need for Contextual Value Added Measures

In previous sections, we have seen that external factors influence strongly the performance of individual learners and hence the school which they attend. So unless these factors can be taken into account and 'removed' using appropriate adjustments, there is no 'level playing field'. This means that making school to school or 2 tier schools to 3 tier schools comparison of any KS tests and GCSE results is meaningless.

This situation has been recognised for some time. In response to this, the approach of contextual value added was devised. There are two distinct systems currently in use; Ofsted Contextual Value Added (CVA) and Fischer Family Trust (FFT) Value Added. For the purposes of this discussion, the Ofsted's system has been used because this one has been adopted by the government and is used in its published attainment tables.

3.2 Ofsted contextual value added system

The Ofsted CVA process uses a statistical method in order to take an individual learner's existing test results (prior attainment) to predict what the same learner's test result will at the next KS test point, assuming that he or she was the 'national

average learner' attending the 'national average school'. This individual predicted test result is compared with the same learner's actual test result. The difference either positive or negative is then the contextual value added for that pupil. School contextual value added scores are calculated using the individual scores for the cohort in that school. CVA's measure learner progress so that are quoted as CVAs for KS1 – KS2, KS2 – KS3 and KS2 – KS4 and KS3 – KS4.

Note that KS2, KS3, and KS4 results use the **same tests for all learners across the country**. However, KS1 results are **individual teacher assessments** and not the same tests for all learners across the country. CVA scores are new. Pilots were completed for KS4 CVA in 2005. The pilot for KS1 – KS2 has only just been completed in 2006. One indication of how new they are is that CVAs scores are not shown in the DfES Achievement and Attainment Tables for 2006.

The CVA statistical model is based on the actual test and exam results of each given year group and their individual characteristics (external factors) e.g. gender etc. The data from a national database of some 600,000 learners in each year group from across the UK is used to assess the impact of a number of external factors on a learner's progress. The external factors modelled⁵ include:

Factor	Adjustment comment
Gender of learner	Allow for different rate of progress made by boys and girls.
Special Educational Needs	Action Plan SEN, on an Action Plan or have a statement.
Ethnicity	Adjustments for 19 ethnic groups in PLASC.
FSM	Eligibility for FSM including an adjustment for learner's ethnic group.
First language	Adjustment for learner's whose first language is not English. Size of adjustment depends on learner's prior attainment.
Mobility	Learner who moved between schools at non-standard transfer times.
Age	Learner's age within year based on their date of birth.
In care	Learner's who have been 'In care' at any time whilst at this school.
Deprivation	Use IDACI measure of deprivation, which is based like ACORN on learner's postcode.
School level prior attainment	Adjustment required where a standard transfer has occurred - the transfer between KS2 and KS3. The average level and spread of learners' attainment on entry to a school also affects the predicted outcome for a learner.

⁵ table summarised from www.dfes.gov.uk/performance/tables/pilotks2_06/k5.shtml

There are one or two more 'fine' adjustments, which need not be considered here.

The Ofsted CVA therefore generates a 'level playing field' for comparing the effectiveness of schools against the 'national average' effective school. Thus far, in the development of measures of school effectiveness, the DfES states that⁶ 'This means that CVA gives the fairest possible indicator of the effectiveness of a school and the best possible basis for comparisons.'

3.3 Combination of CVA scores and Relative Attainment

The DfES published data tabulates CVA scores for the various progressions through the KS for individual schools, and as noted above, can be used to compare schools' effectiveness since they offer the 'best possible basis for comparisons'. This is the correct use of CVAs.

However, in Section 3 of Annex 3 to their report, Suffolk County Council have used CVA scores in combination with the 'school's attainment, in terms of average point score, relative to the National Average' at the same KS level. The use of Relative Attainment to give crossplots with CVAs is entirely wrong. The CVA score has already accounted for the learner's prior attainment whether high or low, in making its prediction of their result at the next KS, based on National statistical data. The CVA score measures the effectiveness of the school or schools in moving the learner to the next KS. The argument that school A outperformed school B in its effectiveness but of course school A's learners started from a lower attainment level is erroneous nonsense on two counts:

1. Firstly, all learners' prior attainment has been accounted for to give a 'level playing field', and
2. Secondly, we know that learners with low attainment at one KS, due to low ability or deprivation usually continue to have low attainment at a later KS. CVAs are not about low or high attainment, they are a measure of the effectiveness of a school against the national average effectiveness, and that is what is important in school to school comparisons.

The correct CVA statement is that school A's effectiveness score was higher than school B's effectiveness score, **without** any 'prior attainment' qualifying statement.

3.4 Ofsted CAV analysis

In the later report on Pupil Performance⁷, Section 5 tabulates the Ofsted CVAs by school cluster for various KS progressions, based on 2005 results. There is no commentary alongside this data except to add 'significance' shading in one column. Since the CVA gives the fairest possible indicator of the effectiveness of a school and the best possible basis for comparisons, these data are very important. The analysis below starts with CVAs based on national KS test results, before moving on to discuss CVA KS1 – KS2 where the KS1 measure is non-national teacher assessments.

⁶ www.dfes.gov.uk/performance/tables/pilotks2_06/k5.shtml

⁷ Annex 5, Pupil Performance Research Findings Part 2, dated October 2006.

3.4.1 CVA KS2-KS4

The KS2 to KS4 CVAs (chart 3 below) calculates the effectiveness of schools as they progress learners from KS2 to KS4. This is the best level playing field progression because both 3 tier and 2 tier have one transition between KS2 and KS4.

The National average effectiveness for this progression is 1000. 2 tier schools are shown in orange and for this progression there is one planned transition from primary to secondary school. 3 tier schools are shown in green and like 2 tier schools but at a different age, there is one planned transition.

As described earlier, where a planned transition occurs, the CVA calculation includes an extra allowance for the transfer, which is based on the school level prior attainment. It should also be noted that in 3 tier schools the first two years of KS3 is taught in Middle schools. This effectiveness measure covers both Middle and Upper schools, although the chart just uses the Upper school identifier.

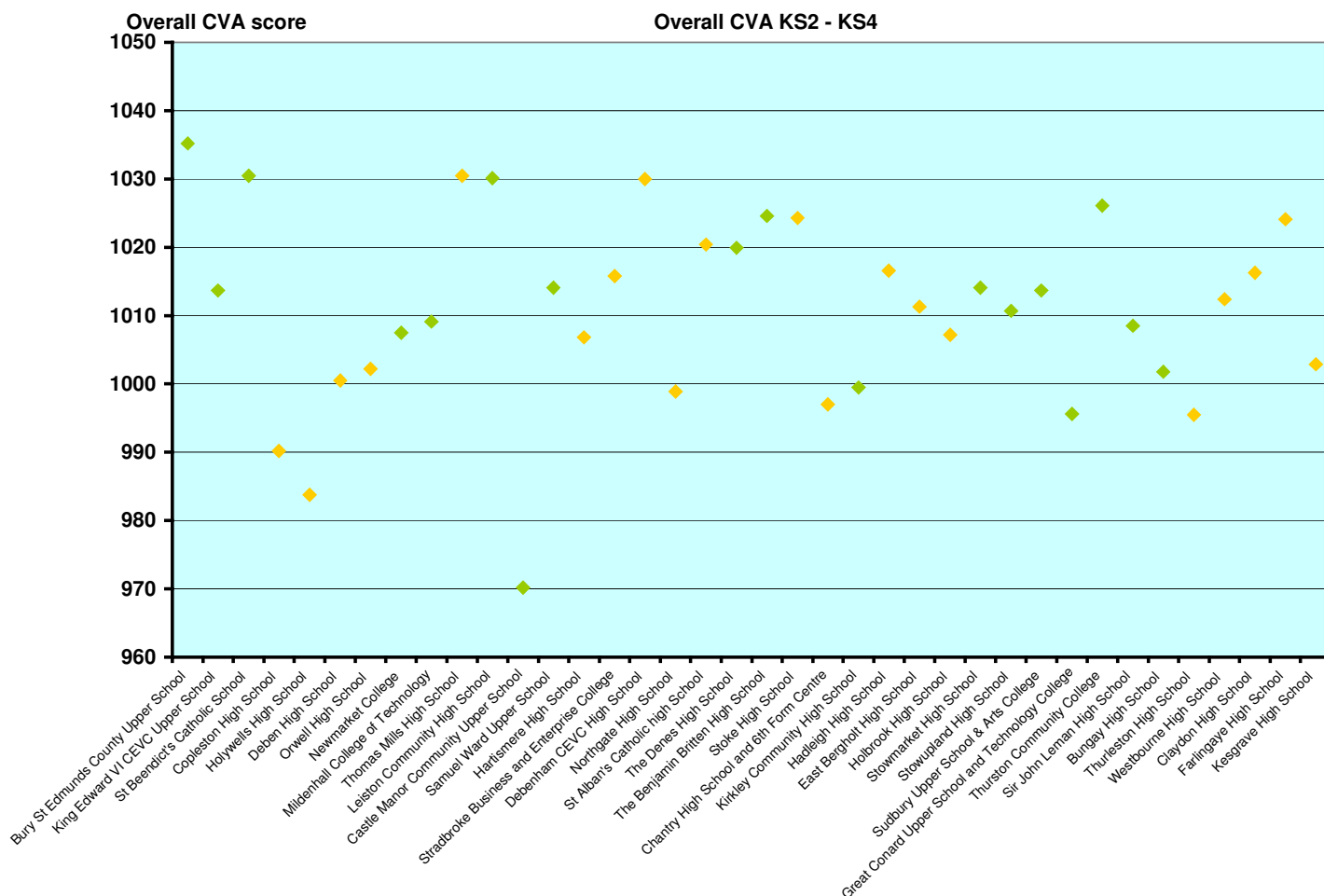


Chart 3
Observations:

1. There is no visible structural difference between the performance of 2 tier and 3 tier schools. Neither group's scores are consistently higher or lower than the others.

Chart 4

Observations:

1. There are 'offsets' when scores are compared between clusters for both 2 tier and 3 tier schools (although to a lesser degree). The scores are 'raised' or 'lowered' in cluster groups. This means that there is a factor at cluster level, which has not been accounted for fully in the CVA calculation. If it had been, then the scores not show any bias for example, as in KS2 – KS4 CVA chart.
2. In a number of cases, 2 tier schools appear to have better effectiveness than the KS1 to KS2 combination of primary and middle schools in 3 tier. Other 3 tier schools have directly comparable scores.
3. Improvements are needed at KS1 – KS2 in both 2 tier and 3 tier.

Point 1 means that for some reason(s), there is not a 'level playing field' for CVA KS1 – KS2, even in the same structural system. Possible explanations for this include:

1. Inaccurate accounting for some factor in the CVA model. The pilot for KS1 – KS2 had only just concluded during 2006 and the model had not yet be released for national use when this data was calculated. There may have been adjustments made to the model between the pilot and its release for National use, which are not reflected here.
2. Variability in KS1 teacher assessments. It is interesting that the 'offsets' appear between clusters. There may be a difference between teacher assessment levels from cluster to cluster. KS1 assessments are known to be notoriously unreliable measures of attainment. There appears to be some evidence of this (see section 3.4.2.1).
3. Cohort size. In primary schools, cohort size at KS2 can vary considerably from less than 10 to just under 100 (see section 3.4.2.2). The CVA model does not account for cohort size. At middle or secondary school level, the cohort size variability is much less.

3.4.2.1 Variability in KS1 teacher assessments

If a learner's attainment is inaccurately assessed at KS1, then the CVA model will predict an incorrect KS2 result for the learner, and hence the effectiveness scored against the their actual KS2 result will also be incorrect. If teacher assessments at school A are 'harsh' and therefore underestimate the learners' attainment, these learners will achieve 'unexpectedly' high KS2 results and the school's effectiveness score will be overestimated. The opposite effect occurs when the learners' attainment at KS1 is 'leniently' assessed – the school's effectiveness score is underestimated, leading to a low CVA.

KS1 teacher assessments are not published on a cluster basis but they are available on a district by district basis. If the KS1 teacher assessments are compared with KS2 test results (a National 'level playing field'), then there is some evidence for this over and under estimation of KS1 attainment. Given the dominance of socio-

economic factors on KS results, you would expect to see KS1 assessments follow a similar pattern across the districts as the KS2 results.

In chart 5 below, the dotted lines with purple symbols are the KS1 teacher assessments for Reading, Mathematics and Science. The solid lines with orange symbols are KS2 test results for English, Mathematics and Science.

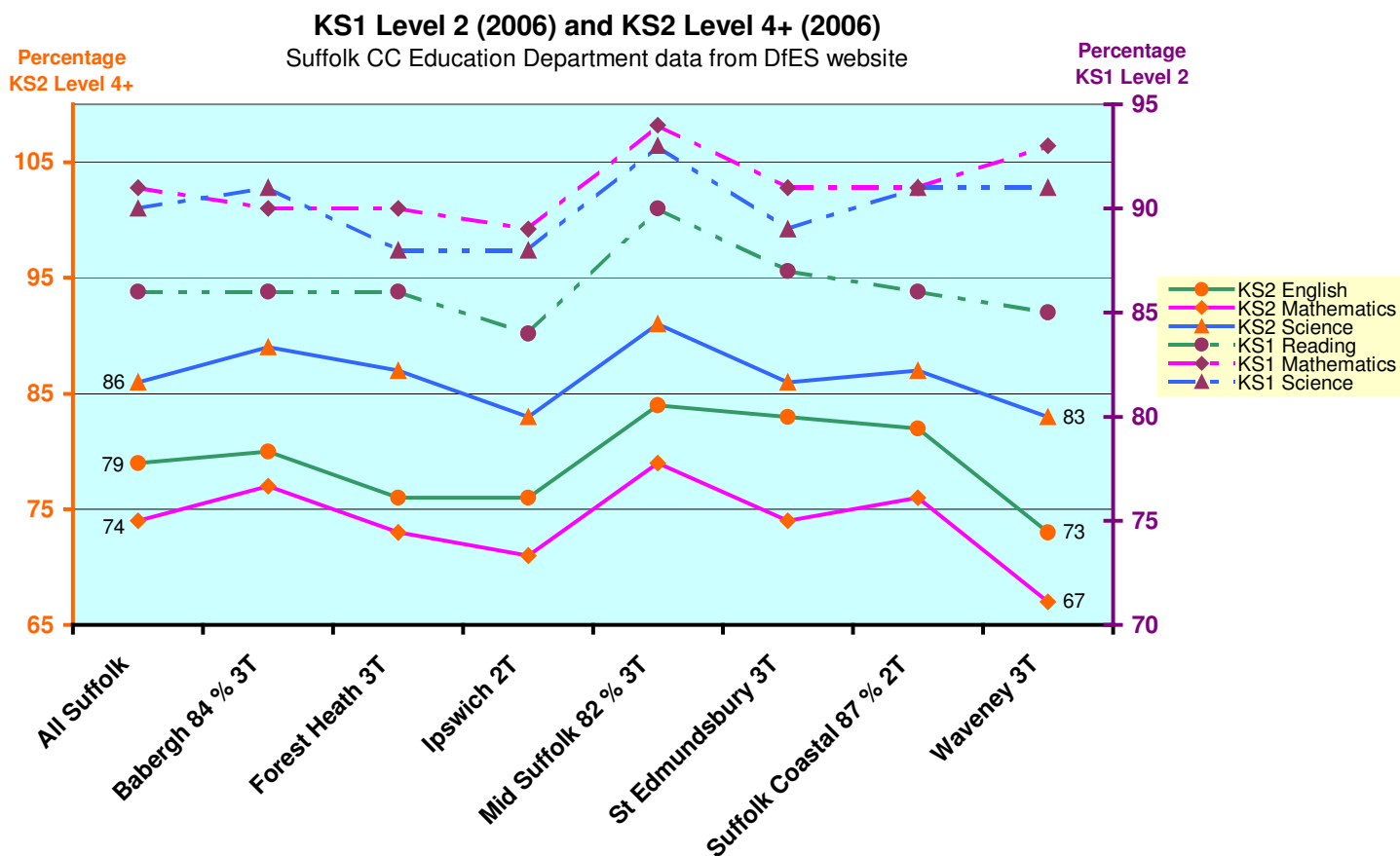


Chart 5

As can be seen, the KS1 assessments only track the KS2 test results in some districts. So for example, Waveney district appears to overestimate their learners' attainment at KS1. This would suggest Waveney district schools have 'reduced' KS1 – KS2 CVAs. Suffolk Coastal appears to underestimate KS1 attainment in Reading and Mathematics, whilst overestimating it in Science. Suffolk Coastal district clusters therefore might have 'increased' KS1 – KS2 CVAs. These are just two instances of the lack of tracking from this chart.

3.4.2.2 Cohort size

Published KS2 test results also list cohort size at individual primary schools. The chart below shows primary school cohort sizes plotted against their KS2 overall test results.

CVA KS1-KS2 against cohort size for 2T Primary Schools
 showing those schools likely to be under capacity
 with respect to 120 minimum size

Overall CVA

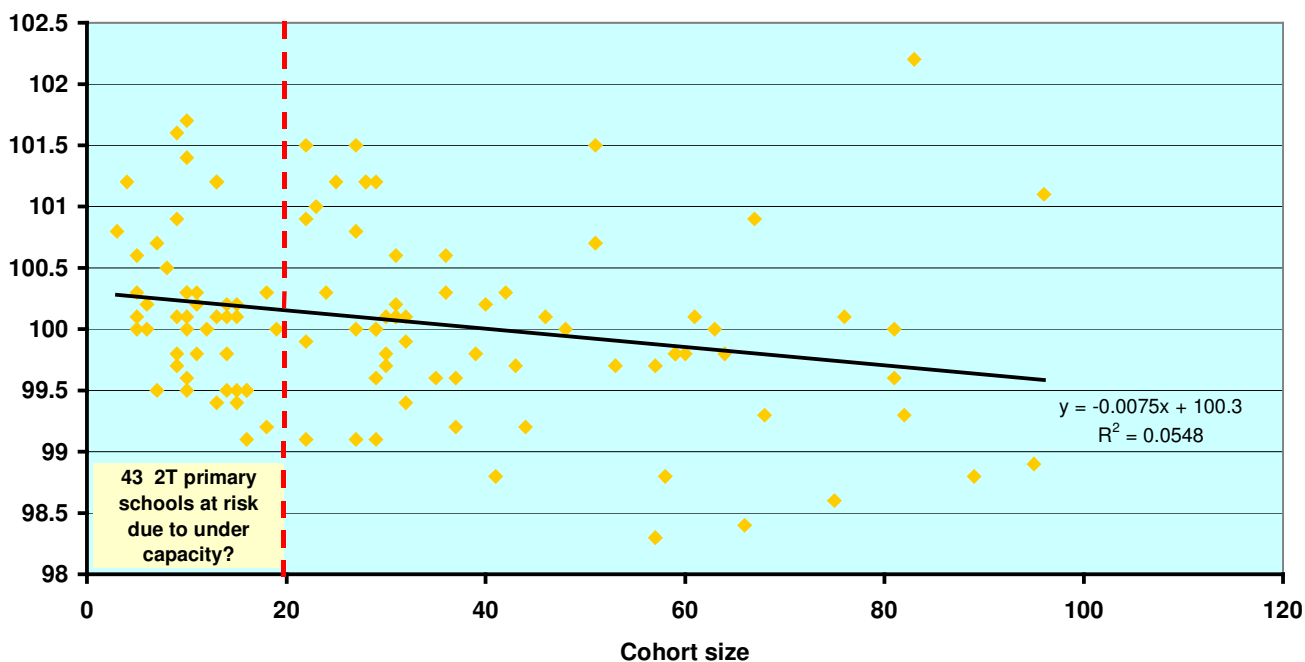


Chart 6

The smallest cohort size is 3 and the largest cohort size is 96. Whilst there is wide variation in the KS2 test results, as the size of the cohort changes, there appears to be a trend which shows a decrease in the KS2 results with an increase in cohort size. So if cohort sizes are increased, KS2 test results will decrease. This is an important consideration when talking about under capacity in Suffolk schools. As shown above, there are some 40 plus primary schools in the 2 tier system, which are likely to be 'at risk' due to under capacity. Merging these cohorts is very likely to reduce KS2 test results. This effect will emerge regardless of any decision about 3 tier schools.

4 CONCLUSION

Where KS test results and GCSE results differ between 2 tier and 3 tier schools, this is due to socio-economic factors which are difference shown by both Free School Meals and ACORN data. The differences are not due to structural differences.

Where 'level playing field' calculations of effectiveness are made, illustrated by Ofsted's CVAs, there are no structural differences visible. 3 tier schools as a group have higher effectiveness scores for the Ks2 – KS4 progression than 2 tier schools as a group. The KS2 – KS 4 progression is the best level playing field for comparison purposes because it models a transition and both 2 tier and 3 tier schools have a transition from KS2 to KS4.

Comparisons using KS1 – KS2 progression is uncertain due to unresolved problems with demonstrating a level playing field. Offsets between clusters in 2 tier schools

group indicate that a factor(s) has not been accounted for correctly.

THE ASSERTION THAT MOVING TO A 2 TIER STRUCTURE COUNTY-WIDE WILL IMPROVE EDUCATIONAL STANDARDS IS NOT JUSTIFIED.

There is also evidence that some of the other proposals, for example, adopting a minimum primary school size of 120, may reduce standards as cohort sizes are increased in 2 tier primary schools.

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