

Title of the consultation: Schools national funding formula, stage 2

Response of the Association of School and College Leaders

- 1 The Association of School and College Leaders (ASCL) represents more than 18,500 education system leaders, heads, principals, deputies, vice-principals, assistant heads, business managers and other senior staff of state-funded and independent schools and colleges throughout the UK. ASCL members are responsible for the education of more than four million young people in more than 90 per cent of the secondary and tertiary phases, and in an increasing proportion of the primary phase. This places the association in a strong position to consider this issue from the viewpoint of the leaders of schools and colleges of all types.
- 2 ASCL welcomes the opportunity to contribute to this consultation. We have been campaigning for a national distribution formula for over two decades and welcome these proposals in principle.
- 3 We believe that seeking to determine a formula for distribution at national level will be the most effective and transparent way of discovering where the most acute funding issues are emerging. Not continuing to develop a national distribution formula will merely mask the issues within the complexity and unfairness of 151 local formulae. A failure to follow through on developing a national funding formula will mean the current inequities of the system will be perpetuated.
- 4 Successive governments have recognised that the existing funding methodology is inequitable and means that similar schools with similar intakes are funded at a different levels merely because they are in different local authorities. A school's funding level is determined by both the national distributional method from central to local government and the variations in the local formulae. It is therefore impossible to determine the exact level of financial difficulty that individual schools are now in without a detailed investigation into the budget of every school in the country.
- 5 The situation will be much clearer with a national funding formula. It would be possible to see clearly where the problems were and also the scale of the difficulties for specific schools. It would be tractable and adjustments could be made in the light of the evidence.
- 6 ASCL have been very clear that the introduction of a national formula for distribution cannot address the insufficiency that currently exists in the level of investment in the education sector. Distribution and sufficiency are separate issues. However inevitably the financial modelling that we have done to stress test the formula has been undertaken using the factor values included in the proposals.
- 7 It is our view that the education system must be funded sufficiently, sustainably and equitably. Failure to do so will have a negative impact on the life chances of the children and young people it is designed to serve. Moreover it will impact on the future economic well-being of the country.

- 8 Expenditure on education is an investment and must be viewed as such, rather than as merely a cost to the public purse. In economic productivity terms we believe that the system is fast approaching the point where production demand exceeds production capacity. Beyond that point is system failure.
- 9 We acknowledge that in cash terms the government is allocating more money than ever to education, but that is only because there are more children and young people in the system than ever before.

With reference to your specific questions

Question 1

Has the right balance been struck to balance then principles of fairness and stability?

- 10 Essentially the response to this is no
- 11 The ASCL Blueprint for self-improving system¹ calls for a funding distribution system that is sufficient, sustainable and equitable. We believe that the distribution system will only be fair when every child has what they need to succeed and that, therefore, fairness can only really be judged on outputs rather than inputs.
- 12 Our financial modelling uses what we have described as a 'baseline' school that has zero or few pupils that qualify for funding above the lump sum and basic per pupil amount. We have assumed that any funding for factors in block 'B' Additional Needs is aimed at levelling the playing field for pupils facing disadvantage and for supporting those pupils with additional needs.
- 13 We have assumed that the lump sum and block 'A' basic per pupil funding in a baseline school should be sufficient to teach pupils in classes that are of reasonable size, to have a teacher in front of those classes for a full teaching week and for this to take place in a building that is maintained, heated and lit. We have assumed a baseline school will have access to reasonable provision of resources and sufficient staff to fulfil necessary back office functions.
- 14 Our findings indicate that the basic levels of pupil funding in the current proposals are too low. (see Annex 1)

Question 2

Set the primary: secondary ratio in line with the current national average of 1:1.29

- 15 We are not convinced that this is necessarily set at an appropriate level.
- 16 The proposals suggest a ratio between primary and secondary that impacts funding levels 'overall' and not at per pupil level.
- 17 Whilst maintaining the current average ratio applied to total funding during the transition to NFF *might* aid stability in the very short term we think it has serious consequences for schools over time. Fixing the ratio whilst pupil level data changes will require variation in per pupil funding rates. In a school with static data this will

¹ www.ascl.org.uk/policy/blueprint-for-selfimproving-system

result in a change in funding without a corresponding change in need. We consider that this challenges the stability and fairness of the formula. (see Annex 1)

Question 3

Maximise pupil led funding

- 18 We broadly agree with the principle of maximising pupil led funding.
- 19 ASCL supports a pupil-led funding model, however we would reiterate that it can only work in practice when the quantum is such that even the 'poorest' recipients have enough to operate as a 'baseline' school and that additionality funding is available to target the pupils for whom it is intended and not subsidise the baseline.
- 20 Our modelling indicates that the proposed per pupil amounts are too low and that combined with the proposed lump sum means that to maintain an acceptable standard of education many schools will fail financially. The schools block quantum is too small to meet the needs of all schools and while 'flat cash' continues and costs rise we think that factor weightings should be directed to per pupil amounts. This will help all schools. (see Annex 1)
- 21 ASCL would urge government to add clarity to the functional expectations of the lump sum amount. One size does not fit all.

Question 4

Within pupil led funding, support the proposal to increase the proportion allocated to additional needs factors

- 22 This is an impossible question to answer in that the critical factor is not the proportion of the overall budget that is allocated but whether the absolute amount allocated is sufficient to meet need.
- 23 For the avoidance of doubt we are not saying that pupils and young people with additional needs shouldn't be financially supported to ensure that their needs are fully met. Our response to this question is firmly driven by the insufficiency of the quantum.
- 24 It is our view that whilst 'flat cash' continues and costs rise the limit of financial efficiency is being breached by an alarming number of schools. In this context we think that the proportion of funding allocated to additional needs should be considered alongside the Pupil Premium Grant (£2.5bn).
- 25 Our modelling indicates that the funding a school might receive for additionality factors under current proposals is probably sufficient – but *only* if it can be fully targeted at those for whom it is intended. (See Annex 1).

Question 5

Proposed weightings for each of the additional needs factors

Deprivation: pupil based @5.5%

- 26 Our modelling indicates that the proportion for deprivation in the formula will deliver an appropriate level of funding should all of this funding be available for additional needs.

As indicated earlier our concern is that schools will have to utilise some, or all, of this funding to supplement the inadequate base level funding.

- 27 There are concerns amongst the sector that the introduction of UFSM has had a negative impact on the numbers of eligible pupils who are actually registered. Whilst the evidence is only anecdotal, if it were to be the case it would weaken the relevance of FSM as a factor. If eligibility data could be sourced from HMRC instead of relying on actual claims we would consider that FSM eligibility could be given a weighting >10%.
- 28 Eligibility criteria for FSM must be rebased following the introduction of Universal Credit. It is disappointing that this has not been done to coincide with this consultation given that proposals for its use as an indicator for deprivation are an intrinsic part of the discussion.

Deprivation: area based @3.9%

- 29 As with other deprivation funding allocations we consider that the formula will deliver broadly an appropriate level of funding in pure cash terms to meet needs should this funding be able to be used solely for the purpose intended.
- 30 IDACI is reviewed and updated every five years. It is our view that this will cause turbulence and conflicts with the transparency, predictability and stability that the formula aims to support. The factors should be chosen to reflect and respond to change in a local population. ASCL would recommend the use of HMRC Child Poverty data as a better source to inform area based deprivation. HMRC Child Poverty data is updated annually.
- 31 The schools block quantum is too small to meet the needs of all schools and all pupils and while 'flat cash' continues and costs rise we think that factor weightings should be directed to per pupil amounts. This will help everybody.

Low prior attainment @7.5%

- 32 Again the amount of funding that this would deliver in pure cash terms is broadly sufficient to meet needs however given the fact that the base level is set too low schools will need to use this funding to supplement the inadequate base funding level.
- 33 ASCL are planning to undertake research into primary assessment and accountability and what this might look like in the future. We would be happy to share our findings and recommendations with the funding policy unit.

EAL @1.2%

- 34 As with other deprivation factors the overall allocation appears broadly appropriate in cash terms. It is the inadequate level of the base funding level that will cause problems as schools will inevitably need to use deprivation funding to cover some of the basic costs.
- 35 We also have some concerns that, given the shrinking role of the local authority and dwindling resources, schools may find it harder to access quality support for EAL students.

Question 6

Mobility Factor

- 36 ASCL agrees with proposals to include the mobility factor using historic data.
- 37 We consider that local authorities for whom mobility is a more significant factor determined by local need are best placed to make suggestions for its use in future years.

Question 7

Proposed lump sum £110,000

- 38 We have serious concerns regarding the proposal that 'one size fits all' in respect of the lump sum factor. We do not believe that this supports equity in the system as a whole.
- 39 Given the range of size and types of school included in the schools block it is clear that a standard lump sum will have very different impacts across the whole system.
- 40 We would support a system of bands designed to increase the efficiency of the lump sum as a factor of a national formula. Evidence from the use of variable lump sums in 'local' formulae suggest that this has been helpful.
- 41 We acknowledge that to date there has not been consensus on the amount that all schools require as a lump sum, nor indeed a clear outline of what the fixed costs of a school of each type and size might be in an efficient financial model. We would urge DfE to continue to work to find answers to these crucial questions. We understand that some work was undertaken on this by LG Futures and look forward to having sight of the outcomes of this piece of work.
- 42 In our financial modelling we have found that the proposed lump sum and basic per pupil level funding values make it impossible for some schools to deliver education to an acceptable level and remain solvent. (see Annex 1 and 2)

Question 8

Sparsity factor primary

- 43 ASCL considers the primary sparsity factor broadly the right amount

Sparsity factor secondary

- 44 ASCL considers the secondary sparsity factor broadly the right amount
- 45 We broadly agree with the proposals for sparsity factor. However we think that DfE should monitor this factor closely during the implementation period to gauge efficiency and effectiveness. We would want to see evidence that sparsity funding is not supporting schools that otherwise would not be non-viable.

Question 9

Lagged pupil growth data as a basis for the growth factor in the longer term

- 46 We broadly agree with the proposal to use lagged data as basis for growth funding in future years.
- 47 It is our view that the mechanism for growth funding must give local authorities flexibility to react efficiently to local need.
- 48 We have concerns that, at school level, under the current system some schools that are experiencing growth but are under their published admission number (PAN), are not able to access growth funding. We would ask that clear guidance on this is issued as part of the later stage proposals on growth funding.

Question 10

The funding floor principle

- 49 We would wish there to be additional funding made available so that no school loses funding as the national funding formulae is brought in. Should no additional funding be available then transitional arrangements will be essential. Under these circumstances ASCL would agree with this principle. We acknowledge that any redistribution will create turbulence and it is essential that the underlying principles of transparency and predictability are upheld to maintain manageable changes and stability throughout the period of transition to the new formula.

Question 11

Funding floor of minus 3%

- 50 Although a funding floor set at -3% would appear a reasonably stepped process it has to be seen in the context of significant cost pressures on schools which will see schools face real terms 'cuts' of 8% in the period before the next election. Staged reductions, under such cost pressures, can only be achieved when the overall quantum is sufficient and if all schools receive funding, in cash terms, which supports delivery of education at an acceptable standard.
- 51 We are seriously concerned that in some cases, published data that gives illustrative allocations according to the NFF mean that some schools in currently low funded areas face reductions. Cheshire East and Trafford are two such examples. Our concerns are exacerbated by the insufficiency of the quantum and the inadequate values proposed for basic per pupil funding. We would urge the government to work with ASCL and others to determine a minimum funding level for any school, below which additional funding is available in the short term.
- 52 We would urge the government to invest sufficiently and sustainably in our education system so that the national formula can meet the needs of a minimum funding level for all schools to ensure that every child and young person can reach their educational potential.

Question 12

New or growing schools

- 53 We broadly agree with the proposals for applying the funding floor to new and growing schools.

Question 13

Minimum funding guarantee at minus 1.5%

- 54 We agree with maintaining a minimum funding guarantee and that, given the current situation minus 1.5% is about the right level.
- 55 Schools need their funding settlements to be predictable and we would ask that the DfE adds some clarity to what will happen after 2019/20. We acknowledge that this is entering a new spending review period but think it is perfectly reasonable for schools to have a 3 to 5 year funding settlement. The DfE's own financial health and efficiency toolkit promotes the value of 3-5 year strategic financial planning and ASCL fully supports this as good practice.

Question 14

Further considerations: the gainers cap

- 56 We think it is wholly appropriate that schools are protected by a funding floor but would expect that this is met through additional funding so that schools that have been poorly funded in the past do not continue to be disadvantaged. We have a concern that without the provision of additional funding the costs of maintaining this over time will delay improving the funding level for those schools due to gain under the new formula. In a fixed quantum model the level of protection afforded to some schools by the funding floor, appears (according to DfE data) to have a significantly limiting effect on schools due to gain under the formula.
- 57 For example a secondary school in Leicestershire where the illustrative allocation indicates a gain of +8.1% (before the cap is applied) will achieve a maximum gain of +3% in year one of transition (assuming that the LA distribution enables this in the 'soft' formula period) and a maximum gain of 2.5% in year two of transition.
- 58 We think that schools, such as the example in paragraph 57 above, should know that they will be allowed to continue to gain until their endpoint is reached, ie after 2019/20. We acknowledge that this is entering a new spending review period but think it is perfectly reasonable for schools to have a 3 to 5 year funding settlement. The DfE's own financial health and efficiency toolkit promotes the value of 3-5 year strategic financial planning and ASCL fully supports this as good practice.

Question 15

Considerations about the impact of the proposed national funding formula

- 59 The ASCL paper 'National Funding Formula Proposals – an assessment of adequacy and fairness' which considers the impact of the proposals is included in Annex 1 of this response.

- 60 The ASCL commissioned paper 'Core Pupil Resource' which considers a minimum funding level for all schools is included in Annex 2 of this response.

The Central Schools Services Block

Question 16

Allocate 10% of funding through a deprivation factor

- 61 Yes – we think that this is reasonable and will reflect the increased welfare costs that evidence suggests are associated with deprivation. We think that this will add clarity to the LA / Schools Forum discussions.

Question 17

Limit reductions to local authority CSSB funding to 2.5%

- 62 Yes – we think that this is reasonable.

Question 18

Other considerations for the CSSB

- 63 We would welcome further discussion on the future role of the schools forum.
- 64 We would welcome discussion on trade union facilities time spending and monitoring.
- 65 I hope that this is of value to your consultation, ASCL is willing to be further consulted and to assist in any way that it can.

Julia Harnden
Funding Specialist
Association of School and College Leaders
22 March 2017

Annex 1

NATIONAL FUNDING FORMULA PROPOSALS – AN ASSESSMENT OF ADEQUACY AND FAIRNESS

A paper has been prepared that seeks to address four questions concerning the proposed National Funding Formula for schools as outlined in the two national funding consultation papers published by the Government in December 2016. This is the Executive Summary. It has been prepared by Sam Ellis, School Funding Consultant, Susan Fielden School Finance Specialist, Effervesce Ltd and Julia Harnden, ASCL Funding Specialist.

THE KEY QUESTIONS:

- 1) Under the current proposals, is the funding that a school would receive adequate?
- 2) Is the funding that a school would receive for additionality factors such as deprivation, low prior attainment, EAL and Mobility sufficient for purpose?
- 3) Is the distribution of the overall quantum through the lump sum and per pupil amount method educationally equitable?
- 4) Is a fixed ratio between the Primary and Secondary funding sensible beyond transition?

KEY ASSUMPTIONS

We have described a “baseline school” as one which has no pupils who qualify for funding above the basic lump sum and basic per pupil amount. We have assumed that any funding for additionality factors is aimed at levelling the playing field for pupils facing those disadvantages. We have assumed that this additional funding should be available for use in supporting pupils with those additional needs, recognising that this is likely to be through enhancing overall curriculum provision with additional teacher time and other resources.

We have assumed that the lump sum and basic per pupil funding in a “baseline school” should be sufficient to place all pupils in classes which do not exceed a reasonable size, to have a teacher in front of those classes for a full teaching week and for this to happen in a building that is maintained, lit and heated to a reasonable standard. In addition to this the school should have a reasonable provision of basic resources and be able to fulfil necessary back office functions.

We have assumed that the additional costs for secondary provision are as set out in the consultation paper, i.e. curriculum complexity, subject expertise, specialist teaching facilities and, for Key Stage 4, exam fees.

KEY FINDINGS

- 1) Under the current proposals, the funding that a baseline school would receive would not be adequate.
- 2) The funding that a school would receive for additionality factors such as deprivation, low prior attainment, EAL and Mobility appears to be reasonable.

- 3) The distribution of the overall quantum through the lump sum and per pupil amount method is not educationally equitable.
- 4) A fixed ratio between the Primary and Secondary funding is not sensible in the medium to long term.

DETAIL – IS THE BASIC FUNDING ADEQUATE?

We have used national school data published by the DfE to inform parameters within a school financial planning model. Having created 450 theoretical schools, we have tested the model against different sizes of school, recognising that expenditure in a school is mostly at the school or classroom level, with only a modest proportion of school costs varying with pupil numbers on a pure linear basis.

We have concluded that funding provided by the lump sum and basic per pupil amounts is inadequate and will not support basic educational provision within schools.

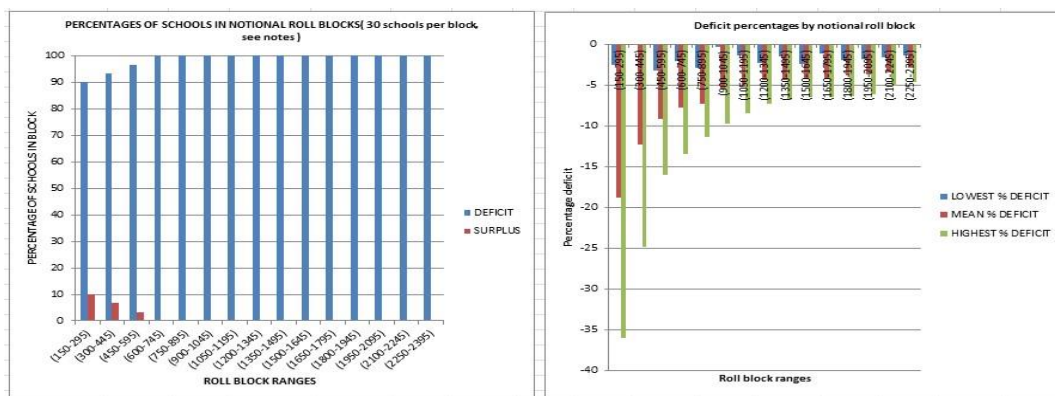
Even if the distribution mechanism is modified by adjusting the lump sum and per pupil levels (so the difference between the basic funding received and the funding required to operate at the baseline level is a constant across all schools), schools operating with reasonable values for average teacher cost, contact ratio, proportion of revenue available for teaching and maximum class size still have to use any funding they receive as a result of deprivation, EAL and other additionality factors to operate at the base line level.

Schools with low levels of deprivation, such as grammar schools and many in rural areas will almost certainly have insufficient funding to use to do this. Many will become insolvent if they continue to operate as effective schools.

We have also concluded that the basic funding provided is inequitably distributed with serious shortfalls for smaller schools per se and for primary schools compared to secondary schools.

Whilst the sparsity factor seeks to support small rural schools and the funding arrangements for new schools and those with a temporary falling roll will catch some small schools, the new educational landscape, involving Regional School Commissioners with local knowledge, could provide a more secure framework for adding essential sophistication to support otherwise underfunded schools on a temporary or ongoing basis, depending on circumstances. An approach could be formularised and have objective criteria.

An example of the output from the model is shown below:



RECOMMENDATIONS

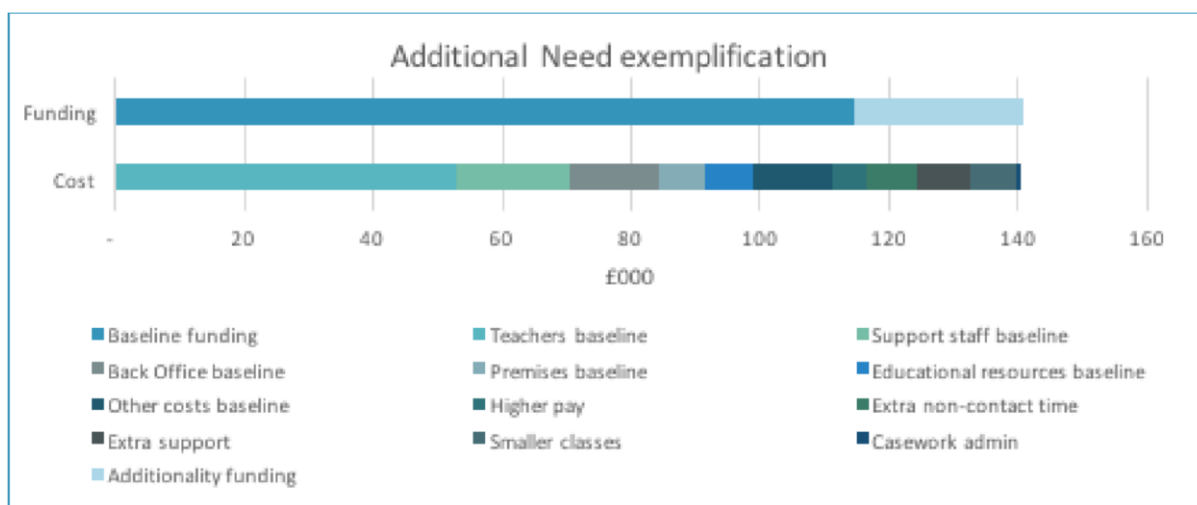
- 1) Consideration must be given to increasing the overall quantum being allocated through the current set of proposals for basic entitlement.
- 2) An objective and criteria based mechanism could be introduced, overseen by the RSCs, to support schools which fall outside the system where these schools are deemed necessary. This could be done with some specific additional factors which would amount to establishing a de minimis position, either for a temporary (falling rolls and new schools) or ongoing (rural and necessary) basis.

DETAIL – IS ADDITIONAL NEEDS FUNDING REASONABLE?

We have considered the additional funding a school would have for a class of pupils with some additional needs, over and above basic provision. We have explored, using spend data for efficient schools, the potential cost of the strategies shown to be effective within the Education Endowment Fund toolkit.

It is important to recognise that the implications of overlapping data sets, multiple need and complex SEN, combined with a wide range of effective educational strategies, all with a different additional cost, makes analysis in this area extremely difficult. An interactive workshop of practitioners together with access to data on pupil need at school level could facilitate a deeper understanding of the most cost-effective strategies for a give pupil profile. This would allow for greater testing of these factors.

An example of the analysis is shown in the table below:



The conclusion reached from this limited analysis is that these factors appear to be set at a sensible level but this needs monitoring in terms of implementation and impact. This is only adequate if it can be used to meet the needs of those students for whom it is intended.

There two exceptions. The ratio between unit values for additional need reflect the basic AWPU ratio (ie 4548% uplift for secondary provision) apart from EAL and one IDACI band. Given the unreliability of the current

EAL data as an indicator of genuine English language difficulties, the uplift at 169% for secondary EAL (compared to the primary EAL factor) appears unreasonably high, despite

the obvious increase in complexity. IDACI band E also appears over generous in secondary (63% uplift), or underfunded in primary.

DETAIL - IS THE BALANCE BETWEEN LUMP SUM AND PER PUPIL FUNDING EDUCATIONALLY EQUITABLE?

In this inquiry we considered whether the distribution of the overall quantum through the lump sum and per pupil amount method was reasonably equitable in the sense that at outcome level all schools have a reasonably equitable opportunity to meet with educational requirements.

We have concluded that the mathematical structure of the formula is too limited and we believe it is a matter of mathematical fact that it can never provide an equitable distribution. We have written a short paper to support this view that is available to any interested party². The situation is more complex than simply changing lump sum or per pupil amounts within the same quantum. Given the range of size and type of educational establishment, it should not be a surprise that a standard lump sum have a differential impact across the whole system, for example, the application of the same lump sum to a two year group UTC at one end of the spectrum and an All Through school at the other.

This mathematical inadequacy has always been the case with the lump sum and per pupil amount approach although it has been made to work in practice by having a quantum which means that the poorest recipients still have sufficient funding and by having additional very specific factors to directly fund schools falling outside the formula parameters. In the past this was done in LAs by the use of additional complex or sophisticated factor, in negotiation with a respectful and mutually supportive school community. This arrangement cannot be replicated within a national formula. Whilst it may be possible to reallocate resources within a large multi-academy trust, to advocate this within a national funding arrangement is to acknowledge that the formula is not fair for all schools.

Whilst 'flat cash' continues and costs rise the limit of financial efficiency is being reached or crossed by an increasing number of schools. In the lump sum and per pupil amount system necessary insolvency starts with smaller schools and can be exacerbated by certain roll numbers, parental choice, the impact of recruitment and retention issues and a lack of strategic financial management. It must be noted there will be some schools where even the most efficient financial management will not make it possible to deliver education at an acceptable standard and remain solvent.

DETAIL – SHOULD THE PRIMARY: SECONDARY RATIO BE FIXED AT 1:1.29?

The consultation proposals recommend that the ratio between primary and secondary funding should be held at the same level as is currently evident from the combined impact of local funding formula, i.e., 1:1.29. This is derived by comparing the total funding for primary and secondary, that is a combination of formula values and demographic data. Whilst maintaining this level may aid stability during initial transition at a national level, holding funding levels of each educational phase at a constant level, this still represents turbulence in some local authorities. More importantly, this notion of a fixed ratio has no place in an argument of stability at a school level over time. Fixing the ratio whilst pupil level data changes will demand an unexplained variation in the per pupil funding rates, with very significant implications for individual schools. As this is a funding formula for schools, we suggest the test must be whether stability and fairness is achieved at school level. Failure to maintain a ratio at a pupil level undermines any formula integrity over time.

² Contact Sam Ellis at samelliscottingham@gmail.com

We have demonstrated in our analysis that decisions about which factors to fix over the medium term can lead to very significant swings of funding (£0.5bn) between phases as the data changes over time.

We have also taken the explanation given for variations in funding between key stages, in terms of curriculum complexity and exam fees and modelled the implications for the basic per pupil funding. This analysis indicates that the funding level proposed for KS3 is overstated, compared the level proposed for primary. However, given that we have already shown that the primary value is inadequate, it is possible to conclude that it is the value for both primary and key stage 4 that are out of line.

In a school with static data, funding will change as a result with no corresponding change in need. As this is a funding formula for schools, we suggest the test must be whether stability and fairness is achieved at school level. Failure to maintain a ratio at a pupil level undermines any formula integrity over time.

B) RECOMMENDATIONS

- 1) The differential between key stages should be reconsidered.
- 2) Open discussion should take place about how schools could be funded equitably over the medium term, to facilitate strategic planning in schools.

NATIONAL FUNDING FORMULA PROPOSALS – AN ASSESSMENT OF ADEQUACY AND FAIRNESS – MAIN REPORT

INTRODUCTION

This report seeks to address four questions concerning the proposed National Funding Formula for schools as outlined in the two national funding consultation papers published in 2016. It has been prepared by Sam Ellis, School Funding Consultant, Susan Fielden School Finance Specialist, Effervesce Ltd and Julia Harnden, ASCL Funding Specialist.

The four questions are:

- 1) Is the funding that a school would receive under the current proposals adequate at a baseline³ level?
- 2) Is the funding that a school would receive for additionality factors such as deprivation, low prior attainment, EAL and Mobility sufficient for purpose?
- 3) Is the distribution of the overall quantum through the lump sum and per pupil amount method reasonably equitable in the sense that at outcome level all schools have a reasonably equitable opportunity to meet with educational requirements?
- 4) Is there any merit in using a fixed ratio between the Primary and Secondary funding?

To answer these questions we have built a spreadsheet model driven by a list of key variables. This is described below and supplied to Malcolm Trobe with this report.

We have assumed that any funding for additionality factors is aimed at levelling the playing field for pupils facing those disadvantages. Hence we assume it should be available for use

³ We define baseline level as the ability to put all pupils in a lit, heated, reasonably equipped classroom with a teacher for the whole school week up to a maximum class size.

in supporting pupils with those additional needs even if this is done through enhancing overall curriculum provision with additional teacher time and other resources. This implies that a baseline school can be defined as one which has no pupils who qualify for funding above the basic lump sum and basic per pupil amount. We have therefore assumed that the lump sum and basic per pupil funding in such a theoretical school should be sufficient to place all pupils in classes which do not exceed a reasonable size, to have a teacher in front of those classes for a full teaching week and for this to happen in a building that is maintained, lit and heated to a reasonable standard. In addition to this the school should have a reasonable provision of basic resources and be able to fulfil necessary back office functions.

This report is supported by a modelling spreadsheet and some detailed analysis of public data. The report itself only contains a limited number of screenshots based on a few examples of typical variables. The spreadsheet itself has been supplied to Malcolm Trobe ASCL Interim General Secretary who commissioned this work. Interested parties should approach Malcolm over possible use of the spreadsheet. Parties wishing to discuss its later development and or the analysis of public data should contact samelliscottingham@gmail.com or sfielden7@gmail.com or julia.harnden@ascl.org.uk The conclusions and some suggestions for ways forward are at the end of the paper

MODEL DESCRIPTION

The spreadsheet model assesses the funding received on the basis of lump sum and basic per pupil funding alone using the values from the stage 2 national funding formula consultation⁴

Lump Sum (all school types)	£110,000
Basic per pupil funding KS1 and KS2	£2,712
Basic per pupil funding KS3	£3,797
Basic per pupil funding KS4	£4,312

The model considers schools of the types primary, secondary, middle all through and UTC by using different numbers of year groups and the relevant values for basic per pupil funding.

For all schools we reduced their basic curriculum cost to the following variables

Average teacher cost in areas which would not attract any area cost adjustment
Proportion of revenue available for teacher cost in a balanced budget Teacher contact ratio
Number of year groups in the school (e.g. 5 in Secondary, 2 in UTC etc.)
Maximum class size when operating at a basic level (see comment below this table)

All the quantities in the table can have the value set by the user of the spreadsheet model and there is no recommended value in this work. We have however formed our conclusions on the basis of what we think are a range of reasonable values. These values are based on data available from the GOV.UK website and on our joint experience of working in and with schools on financial recovery plans and related issues over the last two or three years.

The maximum class size used for the basic provision we refer to in this report is 30 pupils. It could have been 32, or 34 or 28 or any other number but we chose 30 as a starting point

⁴ Schools national funding formula Government consultation – stage 2, 14 December 2014. DfE

given that most classrooms will accommodate 30 pupils a teacher and some basic resources reasonably sensibly. This suggested figure is also congruent with the data used in the current Area Guidelines for mainstream schools⁵. We have assumed that the basic entitlement provided by the lump sum and basic per pupil funding should be the capacity to put all pupils in groups of no more than the chosen maximum class size with teacher for every lesson. More sophisticated modelling to account for option choices in key stage 4, subject specialism, timetable flexibility and the accommodation of part time staff is planned but not included in the current model. Those aspects make the cost of the curriculum more expensive than the simple, 'all classes with no more than 30' model; if the simple model fails the test then a more complex model is not required to answer the questions this report seeks to address. The model also needs extending to allow for the teaching of non-chronological groups and for different key stages to operate with different maximum class sizes to make it a better reflection of the reality at school level and investigate the possible economies in such approaches. Nevertheless, we think the current model is robust enough to demonstrate whether or not there is a problem of equity or sufficiency or both even if, at this stage it cannot be used to say where the critical values in short fall may actually be.

MOST EXPENSIVE AND MOST ECONOMICAL ROLL ANALYSIS

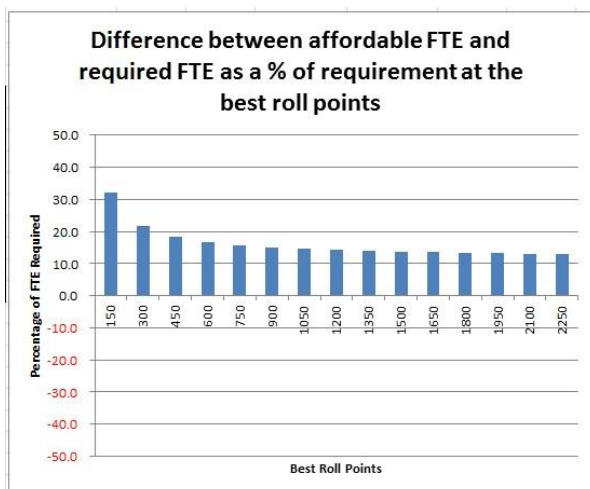
The most expensive situation for a school is where each year group has one more pupil than an integral multiple of the maximum class size. The most economical situation is where every year group is an exact multiple of the maximum class size. Part of the model represents these two situations because at a basic level all schools of the same type, primary, secondary etc. are between those two extremes.

As an initial we examples use these parameters. Please note that the model covers UTC, Secondary, Middle, Primary and All through schools and wide ranges of any parameter shown in the screenshot in a blue font. In this report only a limited number of examples will be given. In the case of a secondary school with exactly the same number of pupils in every year group the basic per pupil funding for KS3 (£3,793) and KS4 (£4,312) can be treated as an average value of £4,003. This average value is only used in the special case of equal sized year groups in a secondary school at all other times the calculations use the separate key stage values.

Maximum class size	30	User select
Year Groups	5	Secondary
Contact Ratio	0.78	User select
Proportion available for Teacher Cost	0.56	User select
Average Teacher Cost	£47,000	User select
Lump Sum	£110,000	Consultation value for all schools
AWPU	£4,003	11-16 average if 5 equal yeargroups

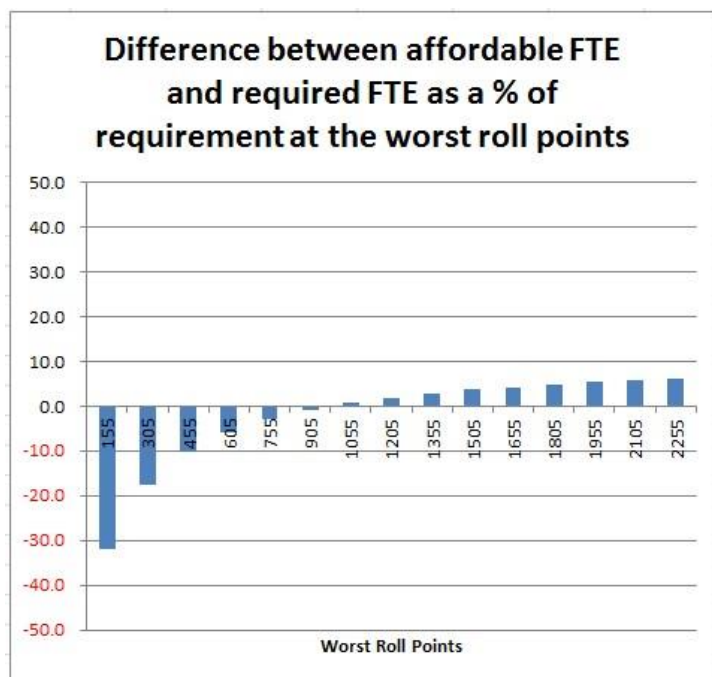
At the best possible roll points with exact multiples of 30 pupils in all year groups all example schools have surplus funding above the basic requirement which means that funding could be used to enhance the basic provision or add to the additionality funding for deprivation, EAL etc. as the school sees fit. In terms of the schools at the specific roll points the result is as shown.

⁵ Area Guidelines for mainstream schools. Building Bulletin 103. June 2014. DfE/EFA



It should be noted that for schools with ideal roll numbers below around 900 pupils there is an increasing advantage in the smaller schools.

The picture is quite different when the worst roll points are considered. This is shown below.



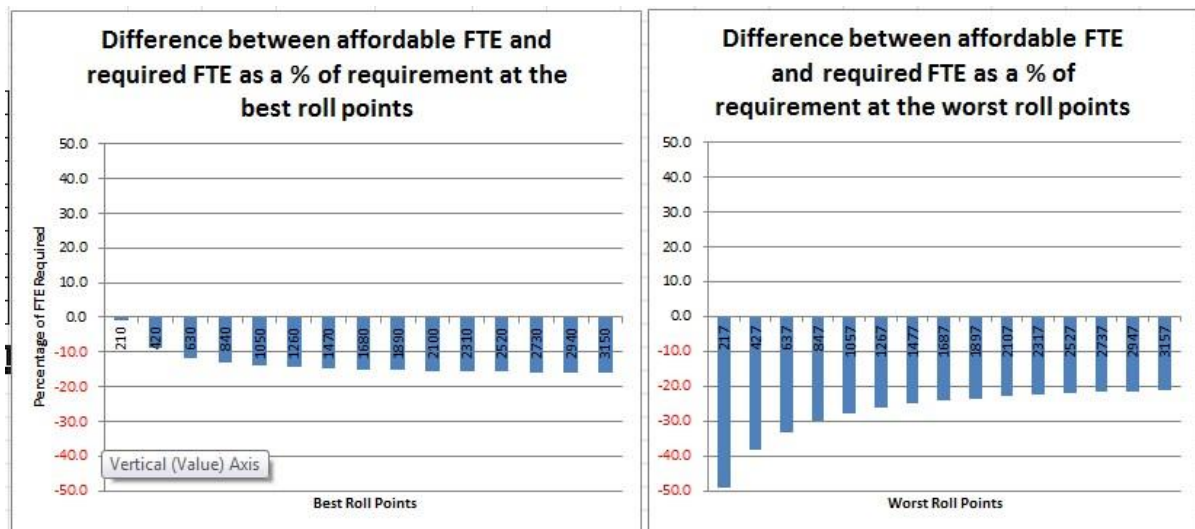
This demonstrates the fundamental inequity in the funding system for smaller schools where the roll numbers are not a perfect match with a maximum class size value. This picture is similar no matter what maximum class size is selected. The only thing that changes is the point where the bars cross from positive to negative. It is worth noting at this point that this simple modelling will be fairly close to the reality of funding for grammar schools with fewer than 1000 pupils in years 7 to 11 that are slightly oversubscribed with respect to whatever the maximum number of pupils they can safely accommodate in a room happens to be.

If one changes the parameters to those of a 7 year group primary school the basic per pupil funding and lump sum will not fund any size of primary school sufficiently to place all students in classes of 30 or less unless one chooses highly unrealistic values for the

average teacher cost and the proportion of the revenue available for teaching. For example with the parameters as shown

Maximum class size	30	User select
Year Groups	7	Primary (R to y6)
Contact Ratio	0.85	User select
Proportion available for Teacher Cost	0.54	User select
Average Teacher Cost	£45,000	User select
Lump Sum	£110,000	Consultation value for all schools
AWPU	£2,712	Primary

The best and worst point output is



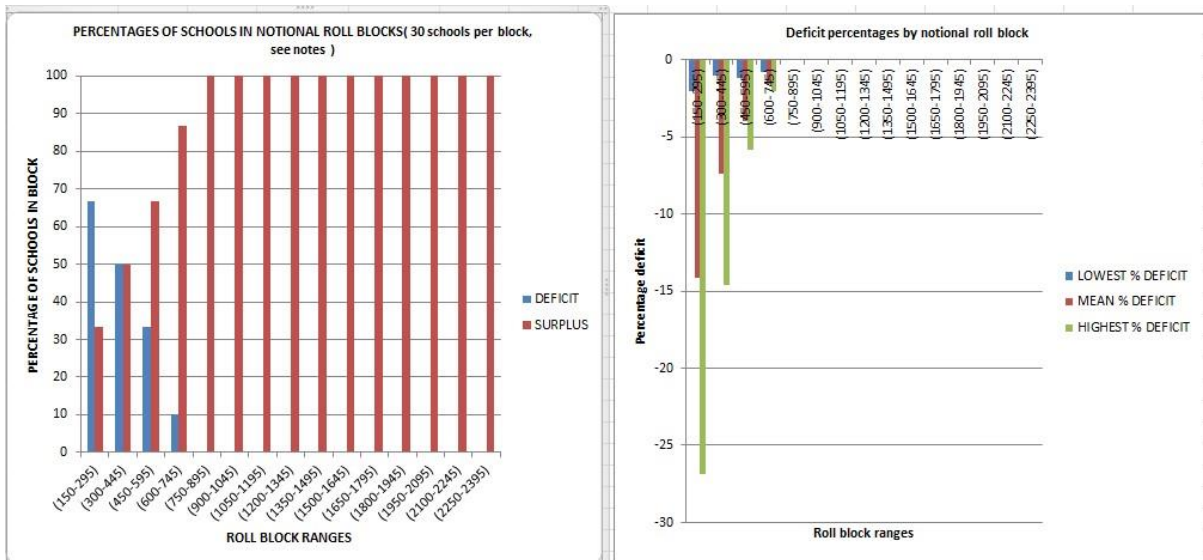
We think that these illustrations are sufficient to show that there is inequity in the distribution both amongst schools in the same phase and across phases and secondly that the amount of funding being distributed as basic per pupil funding is inadequate when taken on its own for the provision of a very basic curriculum.

ROLL POINTS BETWEEN THE TWO EXTREME VALUES

It is quite unlikely that a real school of any type will have roll numbers which exactly match either of the scenarios used in the previous section. We therefore created a sample of 450 theoretical schools with notional roll numbers increasing at a rate of one pupil in every year group from a starting point of one form per year group. A 'form' is defined as the pupil total selected as the maximum class size. For example, for a five year group secondary school with a maximum class size of 30 pupils selected the starting roll would be 150 pupils. The sample schools then increased in roll in with one pupil per year group. In the five year group secondary example this gives total roll points of 155, 160, 165 etc. up to 2395 in school number 450. We then introduced a randomisation factor allowing the roll in any one year group to vary by a percentage either up or down. In Excel this is achieved by using the randomisation function and pressing the f9 key which recalculates the spreadsheet with new random values within the specified range. We grouped the schools into bands which we call 'roll blocks' of 30 schools and calculated the percentage of schools in each block that had funding above or below the level required to meet the basic maximum class provision. Even with a 5% variation either way in every year group the results are remarkably stable in terms of the number of schools in surplus or deficit within any one roll block although the individual schools that are in surplus or deficit may themselves change around. The parameters used for this example are

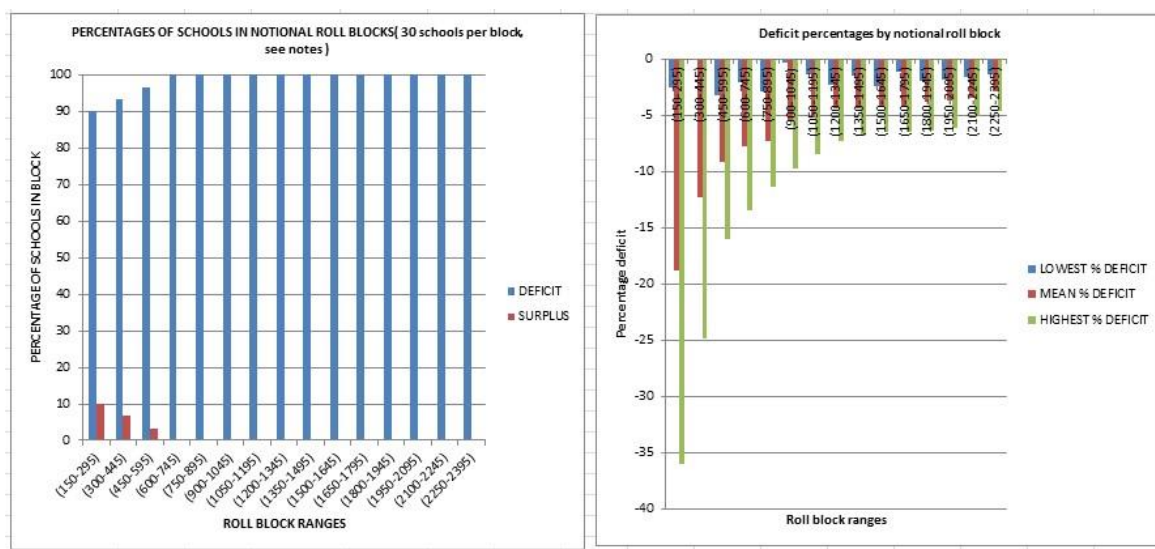
Maximum class size	30	User select
Year Groups	5	Secondary
Contact Ratio	0.78	User select
Proportion available for Teacher Cost	0.57	User select
Average Teacher Cost	£47,500	User select
Lump Sum	£110,000	Consultation value for all schools

The Basic per pupil funding levels used are the consultation values for KS3 and KS4 and there is a 5% variation each way in all year groups in the 450 schools in the model. Typical results are:



This would appear to indicate that at the basic provision level schools with rolls below 750 are at increasing risk of having to use any additionality funding to support basic curriculum provision. Although this is not shown in this report on the graphs the schools above 1000 on these parameters have funding with which they can enhance either the basic curriculum provision or the additional needs.

If one reduces the teacher contact ratio to say 0.76 to reflect recruitment pressure needs to offer time and promoted posts to attract some subject candidates and increases the average teacher cost to a not unreasonable £50,000 and, to take account of cost pressures in the non-teaching element of the budget, puts the proportion available for teaching to say 0.54 then the picture changes to this.



No secondary school in this situation can be certain of being able to sustain basic maximum class size provision without drawing on its additionality funding. Schools with low levels of additional needs with roll numbers lower than about 1000 pupils in years 7 to 11 may well have insufficient additionality to even do that, for example grammar schools or smaller rural schools in areas with low deprivation.

We think this modelling shows that the current overall level of funding in schools notwithstanding any inequity in its distribution is at a critical point in terms of schools being solvent if they are to teach pupils for a full week in acceptable circumstances and in an educationally effective manner.

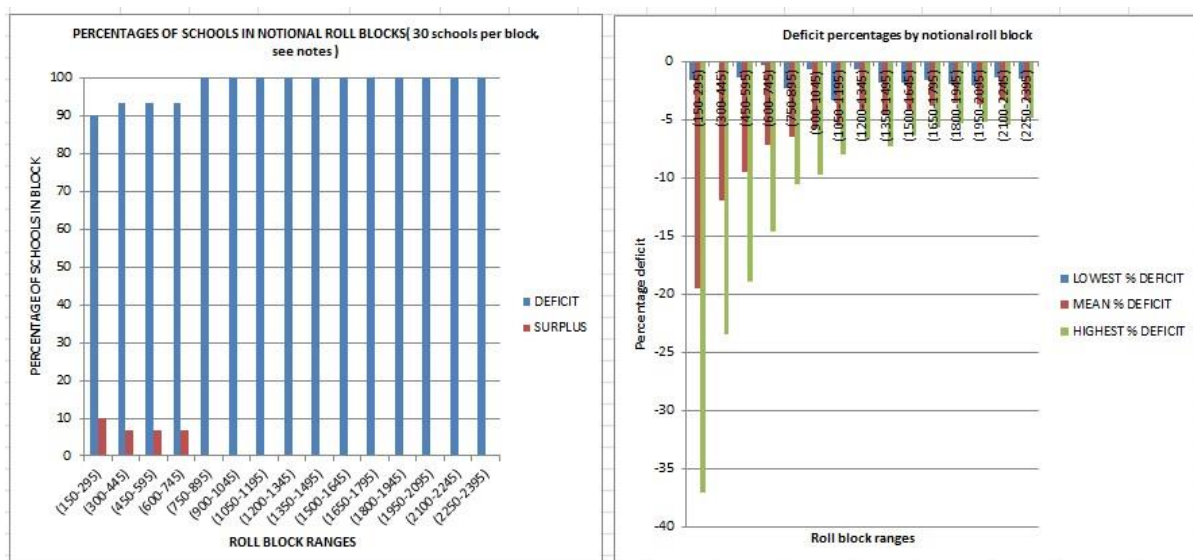
THE PROPORTION OF REVENUE AVAILABLE FOR TEACHING COSTS

The proportion of revenue available for teaching is an area which needs further work. Using the data available from the GOV.UK website⁶ we extracted samples of thirty schools similar to a school with low levels of additional need that was in the first decile for financial efficiency. The results for both primary and secondary in terms of spending per pupil on non-teaching costs were

	Teachers	Educational Support Staff	Back office	Premises	Educational resources	Other	Total non-teaching
Median value Secondary per pupil	£3,051	£342	£783	£314	£498	£370	£2,307
Median value Primary per pupil	£1,954	£650	£507	£256	£287	£450	£2,149

If the absolute per pupil values shown in the last column are tested against the random school model then for secondary schools with an £110,000 lump sum and basic per pupil funding of £3,797 for KS3 and £4,312 for KS4 per pupil spending of £2,307 on non-teaching would leave around 50% of the revenue available for teacher costs. This gives the following result with an average teacher cost of £47,000

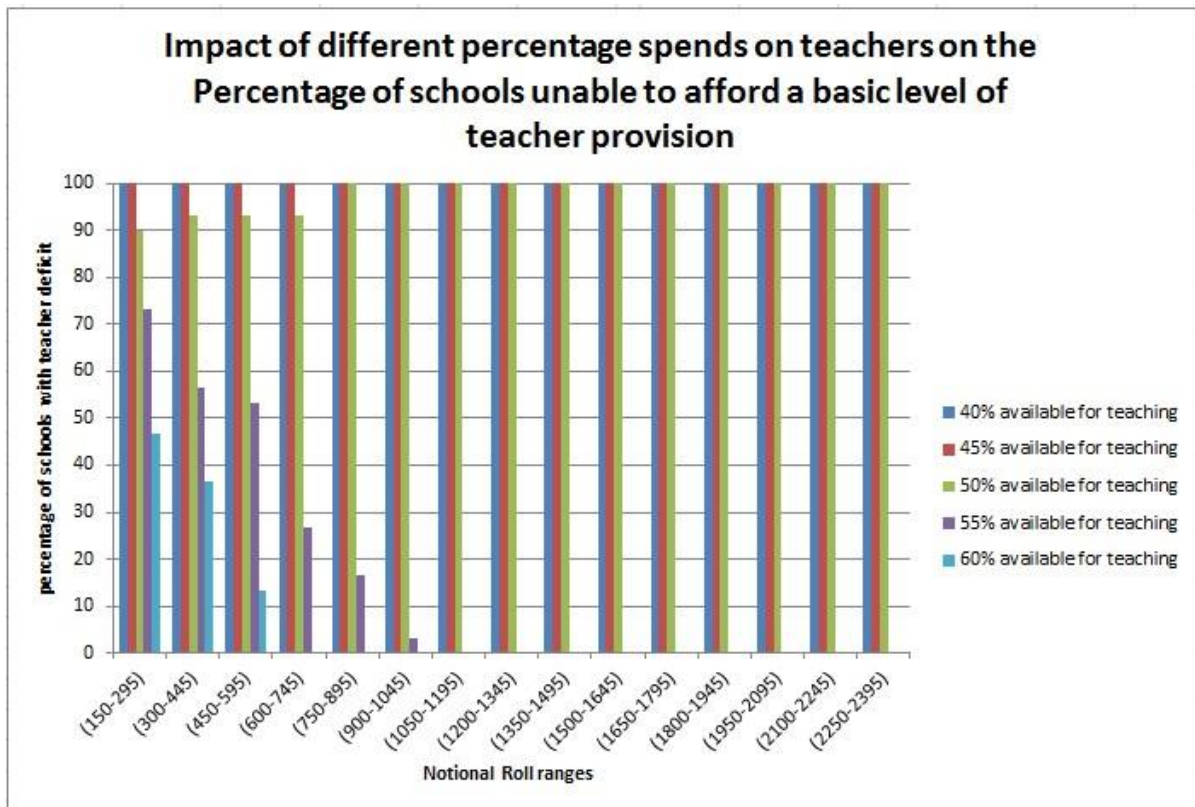
⁶ www.compare-school-performance.service.gov.uk



Virtually all secondaries would be unable to cope unless they had sufficient additionality funding with which they could support the baseline system. It is almost certain that one year's round of unfunded pay increases for all staff would put most secondaries into deficit if this were the funding they were to receive.

Using the median value for primary schools shows an even worse situation. This again brings into question the relationship between secondary and primary funding levels in terms of how equitable that is.

More work needs to be done to estimate how likely it is that any school could operate at or below these median levels and on how the proportion of revenue available for teacher cost changes as costs increase and funding remains relatively static or reduces to a cash floor. Notwithstanding that it seems reasonable to assume at this point that few schools will be in a position to spend more than say 55% of their revenue on teacher cost. In the absence of more detailed work on this we produced outputs for a range of values for a maximum basic class of 30, average teacher cost of £47,500 and teacher contact ratio of 0.78 in a secondary school. These values were randomised for 450 different school roll numbers at +/- 5%. The results for a range of percentage spends on teaching staff were remarkably stable. A typical output is shown below.



In order to provide a basic level curriculum with no further enhancement for such things as technology groups or option schemes or detailed setting arrangements secondary schools have to be able to spend a minimum of 55% of the basic lump sum and per pupil revenue on teaching. Again schools with fewer than 900 pupils and those with higher fixed premises cost are at significant financial risk unless additionality funding can be used to support basic provision. If the average teacher cost is increased the situation is simply worse. Two years of unfunded pay increases will make the situation untenable for many schools.

ADDITIONALITY

In addressing the question of whether additionality funding is set at an appropriate level we have had to, for this section of the analysis, assume that basic funding is adequate. We have looked at the additional buying power of funding resulting from a proportion of pupils in a class having one or more additional need. In this area we have only undertaken very limited modelling, for a number of reasons.

This is a more difficult area to analyse as data sets overlap and we have to assume that multiple characteristics imply multiple additional needs. Secondly there is a degree of opinion about the strategies a school might decide to use to address additionality and therefore a possible range of expenditure given the differing costs of different approaches. In addition, as most effective strategies require, to a greater or lesser extent, something different or additional from existing staff it is hard to disentangle the additional from the basic provision.

Notwithstanding that, we took the values associated with levels of deprivation, low prior attainment and other additionality factors indicated in the consultation and estimated what this would purchase in a school for example in terms of additional teacher time, additional support staff and other resources. We used as a reference in doing this, the recommendations of the Educational Endowment Fund. Our initial tentative conclusion,

restated below, is that provided the additionality funding is used exclusively for the purpose for which it is intended even if that is a whole school strategy, the rising tide which lifts all boats, the levels proposed appear reasonable. The caveat is that we feel this area needs close monitoring as relevant data becomes available once it is put into practice.

The additionality funding will only be adequate if it is not required to support any shortfall in the level of basic provision.

Our conclusions in this section are based on public data⁷ and the following initial analysis

	Teachers	ESS	Back office	Premises	Educational resources	Other	Total spend
Median spend/pupil from efficient low need schools	1,954	650	507	256	287	450	4,225
Average class of 27 pupils	52,962	17,612	13,747	6,925	7,781	12,182	114,495
Available to spend if 23% extra							26,334
							140,829
Increase ATC by 10% to recruit and retain staff	5,296						
Half a day more PPA time (reduce contact ratio)	7,701						
More support staff capacity (one day a week)		3,522					
Staffing cost per class of 27 becomes:	65,959	21,134					
Reduce class size to 25	71,236	22,825					
Back office - extra admin re casework	add 5%		14,434				
No additional premises costs				6,925			
Extra resources for 10 EAL & LPA pupils	£500/pupil				12,781		
No change to other costs						12,182	
							140,383

One of the most cost effective strategies advocated within the EEF Toolkit is feedback. The provision of high quality feedback can lead to an average of eight additional months' progress over the course of a year, "feedback can take a range of different forms, including written feedback in the form of marking, verbal feedback and peer feedback". In the example above, teaching staff are given more time for feedback and a smaller group of pupils to work with. Similarly, the resource requirements for improving use of homework and developing a mastery curriculum, meta-cognition and self-regulation (other proven strategies) have similar resource implications. Where the additional need data is taken as a proxy indicator for SEND and vulnerability, additional non-contact time and smaller classes will also help class/form tutors and senior leaders engage with parents and other agencies.



⁷ DfE Performance data download as at January 2017 & SFR20

There is some questionable data underlying this analysis and a significant margin for error, however, the initial tentative conclusion is that the additionality values are probably about where they should be.

There two exceptions. In considering the values proposed within the consultation, there are two factors for which the secondary value is out of line with the balance between phases that is evident throughout the rest of the formula, i.e. 45-48% uplift for secondary provision. The ratio between unit values for additional need reflect the basic AWPU ratio apart from EAL and one IDACI band. Given the unreliability of the current data as an indicator of genuine English language difficulties, the uplift at 169% for secondary EAL appears unreasonably high, despite the obvious increase in complexity in KS3 and 4. IDACI band E also appears over generous in secondary (63% uplift), or underfunded in primary.

THE SECONDARY TO PRIMARY RATIO

Modelling shows a very clear difference between the potential situation in primary schools and secondary schools. No view has been taken about the level at which it might be acceptable for a primary school to teach pupils in non-chronological year groups. We have also not built in a different maximum class size for key stages in this initial model. Both these factors would ease the situation to some extent in some schools but may be educationally undesirable and hence in a different way inequitable. Notwithstanding that at the baseline level primary schools appear to be in a much more difficult situation than secondary schools.

We have done some initial analysis on the proposed fixed ratio and the basic pupil values based on public data⁸

The application of a fixed primary: secondary ratio results in a gradual funding shift. The proposal within the consultation paper is to fix the primary: secondary ratio at 1:1.29 as this is the level currently exhibited within local formula and there has been some stability over time. This is calculated on the basis of the total amount of funding allocated to each sector, i.e. Primary (data x unit values) compared to secondary (data x unit values). As the data changes nationally, fixing the ratio will require a corresponding adjustment to the unit values. In a school with static data, funding will change as a result with no corresponding change in need. The policy position is that a fixed primary: secondary ratio gives stability.

Using the 2016 pupil projection data (SFR25)⁸ the impact of fixing a primary: secondary ratio can be demonstrated. The impact of the data change over time is that a fixed ratio based on total spend rather than per pupil values effectively shifts funding from secondary to primary. The funding shift is equivalent to approximately £0.5bn over the period 2016 to 2020. Although we are considering this ratio in isolation it must be born in mind that in a distribution system which uses a fixed quantum the decision about which parameters to fix and which to vary will impact on the balance between basic and additional needs funding. Maintaining the ratio of total funding between phases only brings stability at a national level. As this is a funding formula for schools, we suggest the test must be whether stability and fairness is achieved at school level. Failure to maintain a ratio at a pupil level undermines any formula integrity over time.

The decision about which parameters to fix and which to vary affects the total spend requirement which could impact on the balance between basic and additional needs funding within a fixed quantum:

⁸ www.gov.uk/government/statistics/national-pupil-projections-july-2016

Total spend in 2020 using fixed AWPU rates is £22.517bn
 Total spend in 2020 using fixed ratio based on the primary AWPU rate is £22.029bn
 Total spend in 2020 using fixed ratio based on the secondary AWPU rate is £22.976bn

We have tried to demonstrate that the primary:KS3:KS4 weighting used in the consultation is fair at the point of implementation notwithstanding any idea that a change in underlying data will shift this at pupil level over time if the overall ratio is maintained.

For the sake of illustration we have assumed that the primary value allocates enough funding for a class of 30 pupils, with a teacher at a national average salary who has PPA time and a manager and some support staff time, with a safe and suitable classroom and adequate books. We have taken the reasons cited in the consultation paper for a difference. These are the need to employ more subject experts and have specialist teaching facilities; and the additional cost of examination fees at key stage 4.

This indicates adjustments would be reasonable to adjust the baseline up to account for curriculum complexity, subject expertise, specialist facilities and the additional cost of exam fees in year 11 (KS4). We have modelled the differential in cost for these items using data from DfE Performance data download as at January 2017 & SFR20. ie

Analysis:			
DfE Performance data download as at January 2017 & SFR20			
Average teacher cost	Primary	£	36,827
	Secondary	£	39,396
Pupil:teacher ratio	Primary		20.50
	Secondary		15.28
Average class size	Primary		27.1
	Secondary		20.4
Contact ratio (derived)	Primary		0.76
	Secondary		0.75
Class size split (derived)	KS3 (3 years)		22
	KS4 (2 years)		18
			20.4
Analysis of spend data on E20 exam fees per pupil		£	113

On the basis of these figures

	Primary	KS3	KS4
AWPU primary - baseline	2,712	2,712	2,712
Adjust for contact ratio		2,739	2,739
Adjust for class size		3,374	4,124
Adjust for exam fees			4,237
<i>No adjustment for teacher salary</i>			
<i>Increase over primary</i>		24%	56%
Proposed AWPU values	2,712	3,797	4,312
<i>Increase over primary</i>		40%	59%

If the primary per pupil value is adequate, then the KS3 value would appear to be significantly overstated. The relative primary and KS4 values provide for a difference in average class size from 27.1 to 18. Whilst evidence that additional early investment is not beneficial this differential could be seen as evidence of sustained under-resourcing of primary provision.

It must be stated that the initial analysis above is only partial and indicative at this stage.

CONCLUSIONS AND RECOMMENDATIONS

There are two quite distinct issues and we think it is vital to keep them separate. These are the size of the overall funding 'quantum' being distributed and the equity of the distribution mechanism.

This paper is not intended a complete commentary on the proposals in the second stage consultation⁹ for example we do not make any assessment of the proposed cash floor. It does however seek to address the issues of quantum and distribution amongst others.

A) CONCLUSIONS

- 1) *Is the funding that a school would receive under the current proposals adequate at a baseline level?*
No. We have concluded that funding provided by the lump sum and basic per pupil amounts is inadequate. Furthermore it is inequitably distributed with serious shortfalls being clear in smaller schools and also in primary schools compared to secondary schools. Even if the distribution mechanism is modified by adjusting the lump sum and per pupil levels so the difference between the basic funding received and the funding required to operate at the baseline level is a constant across all schools then schools operating with reasonable values for average teacher cost, contact ratio, proportion of revenue available for teaching and maximum class size still have to use any funding they receive as a result of deprivation, EAL and other additionality factors to operate at the base line level. Schools such as grammar schools and rural schools with low levels of deprivation will almost certainly have insufficient funding to use to do this. Many will become insolvent if they continue to operate as effective schools.
- 2) *Is the funding that a school would receive for additionality factors such as deprivation, low prior attainment, EAL and Mobility sufficient for purpose?*
Probably. Initially this appears to be set at a sensible level but needs monitoring in

⁹ Op cit

terms of implementation and impact. This is only adequate if it can be used to meet the needs of those students for whom it is intended.

- 3) *Is the distribution of the overall quantum through the lump sum and per pupil amount method reasonably equitable in the sense that at outcome level all schools have a reasonably equitable opportunity to meet with educational requirements?*

No. The mathematical structure of the formula is too limited and we believe it is a matter of mathematical fact that it can never provide an equitable distribution. We have written a short paper to support this view that is available to any interested party¹⁰. The situation is more complex than simply changing lump sum or per pupil amounts within the same quantum. It does however seem strange that the same lump sum could be applied to a two year group UTC at one end of the spectrum and an All Through school at the other.

This mathematical inadequacy has always been the case with the lump sum and per pupil amount approach although it has been made to work in practice by having a quantum which means that the poorest recipients still have sufficient funding and by having additional very specific factors to directly fund schools falling outside the formula parameters. In the past this was done in LAs by the use of factors for seemingly unusual issues such as cess pits. This type of ad hoc modification has no place in a sensible national formula and is only mentioned to illustrate the point that the type of formula being used only worked in the past because a) there was sufficient funding and b) it could be modified to accommodate special cases at a local level. In a sense there was a local benevolent dictator who could 'rob Peter to pay Paul'. We return to this point in the possible use of MATS or school groups to ease the situation later on. Since 2013 the fudge factors like cess pits have gone. Whilst 'flat cash' continues and costs rise the limit of financial efficiency is being reached or crossed by an increasing number of schools. In the lump sum and per pupil amount system necessary insolvency starts with smaller schools and can be exacerbated by certain roll numbers, parental choice, the impact of recruitment and retention issues and a lack of strategic financial management. It must be noted there will be some schools where even the most efficient financial management will not make it possible to deliver education at an acceptable standard and remain solvent.

We think there are modifications possible within the current system to improve the equity of distribution. These are outlined in a later section.

- 4) *Is there any merit in using a fixed ratio between the Primary and Secondary funding?* Modelling shows a very clear difference between the potential situation in primary schools and secondary schools. This indicates that the fixed ratio and its mechanism should be reconsidered. No view has been taken about the level at which it might be acceptable for a primary school to teach pupils in non-chronological year groups. This would ease the situation to some extent in some schools but may be educationally undesirable and hence in a different way inequitable. Initial modelling with public data from 2016 indicates that maintaining the ratio of total funding between phases only brings stability at a national level. In a school with static data, funding will change as a result with no corresponding change in need. As this is a funding formula for schools, we suggest the test must be whether stability and fairness is achieved at school level. Failure to maintain a ratio at a pupil level undermines any formula integrity over time.

¹⁰ Contact Sam Ellis at samelliscottingham@gmail.com

B) RECOMMENDATIONS

- 1) Consideration must be given to the overall quantum being allocated through the current set of proposals
- 2) A mechanism must be found to support schools which fall outside the system where these schools are deemed necessary. This could be done with some specific additional factors which would amount to establishing a *de minimis* position. This is essentially a fudge and cannot be seen as a long term or satisfactory solution.
- 3) The differential between primary and secondary phases should be reconsidered
- 4) Open discussion should take place about how schools could be funded equitably at the point in the future when we reach the end of the useful life of whatever follows from the current proposals. This discussion must not be placed in a restricted solution space with boundaries such as 'it has to be pupil driven', 'it has to have lump sums in this value range' 'it has to be simple'. The aim should be to find a solution to the problem first which can be judged in terms of output rather than process and then seek to explain it at a high level. As an analogy few people can understand or explain the detail workings in an iPhone but it is remarkably simple and transparent at a high level. We are willing to supply our modelling to support that approach.

Within any quantum if the lump sum and per pupil amount approach is not open for full discussion in the sense that some suggestions such as a different mathematical basis for distribution is 'off limits' then it certainly needs some modification to support smaller schools with something like a 'de minimis' funding situation for some categories of school corresponding to the way the cash floor has been introduced to protect currently higher funded schools. We have not included any modelling of this in this report but would be willing to share our ideas on how this could be established and how the characteristics of qualifying schools could be identified with any interested party.

There are other variants of this approach within a MAT or under the guidance of a regional commissioner's office. In this variation there is some more local authority responsible for redistributing a top slice taken from the relevant group of schools to support the necessary small schools that are deemed to be inadequately funded by the system. The difficulty here is the perception that the distribution formula is allocating an equitable amount at individual school level and to then expect a larger school to give up some of the funded allocated to it by the formula to support a smaller school may not be so simple.

These approaches are only different versions of the old local formula fudge approach and will eventually fall apart in terms of application and credibility in the same way that previous systems have done. We are willing to share views and modelling on quite different approaches to school funding that we think could be more equitable. For example and counterintuitively it is possible to redistribute the same quantum using a very large lump sum and smaller pupil amount so that all schools have sufficient to operate at the worst roll points. The problem with that approach is that one needs different types of lump sums for schools with different year groups and some other complexities. This in itself is not equitable but it is arguably an improvement. This meets with the 'political with a small p' difficulty of discussing anything that cannot be described as simple and transparent and also anything which is counterintuitive when expressed in words rather than mathematically.

The key issue appears to be that schools need to spend money in a per-school, per pupil and also per teaching unit manner. The lump sum and per pupil amount method only addresses the first two of these factors and when austerity is the background and schools

are small the absence of a per class element in the funding becomes a significant and serious issue. As above we have done some modelling work on this idea and are willing to discuss that with any interested party.

DISCLAIMER

This report is limited in that it only seeks to address the questions set out at above. There is still work to be done in making constructive suggestions of how funding could be distributed from a fixed quantum in a more equitable manner and how assessments could be made concerning the essential and desirable levels of funding for schools in different situations. We will continue to work on these issues outside the remit of this report and forward any relevant findings to relevant and interested parties. Equally we are willing to meet with such parties to share thinking and ideas which are not restricted by policy decisions in advance of possible solutions.

This disclaimer governs the use of this report. Whilst every effort has been made to ensure accuracy, this is an initial investigation and may contain some errors. The views, opinions, findings and recommendations expressed in this report are strictly those of the authors and are made in good faith. ASCL cannot be held responsible for any consequences resulting from their implementation.

This report has been produced for use by ASCL only. ASCL may choose to make their findings and analysis available to a wider audience to encourage debate and inform the consultation on a national funding formula for schools in England.

Sam Ellis, Susan Fielden, Julia Harnden
January 2017

Annex 2



As part of the response to the National Funding Formula consultation, ASCL commissioned an initial piece of analysis from two school finance specialists, Sam Ellis and Susan Fielden. Working with Julia Harnden, ASCL Funding Specialist, a technical analysis was undertaken to determine whether the proposals could be demonstrated to be fair and adequate. The conclusion was that they were neither and that further development would be required to meet policy objectives and agreed underlying principles. (Annex1 ASCL written response to Stage 2 NFF schools block consultation)

Further analysis has been undertaken, including consideration of the spending decisions of a sample of good and efficient schools and the development of a theoretical curriculum model to inform a funding approach. ASCL has been pleased to sponsor this work, particularly in order to inform evidence-based consideration of the core funding levels required by schools.

The attached executive summary (Annex 2 ASCL written response to Stage 2 NFF schools block consultation) has been commissioned by ASCL as part of the NFF response and has been presented to DfE officials at a key stakeholder meeting, along with similar analysis from other interested groups. The analysis will also be shared with the Education Policy Institute.

With approved access to the underlying NFF data, some limited impact assessment has been undertaken to ensure that the proposals are reasonable in the current financial climate. ASCL would be pleased to engage in further technical development work to ensure the success of the NFF and the fair, efficient and adequate funding of core educational provision in all schools.

Malcolm Trobe
ASCL Interim General Secretary

CORE PUPIL RESOURCE – EXECUTIVE SUMMARY

A MINIMUM FUNDING LEVEL FOR SCHOOLS

The implementation of the NFF is at risk due to the shortfall in the overall quantum of funding and the focus on winners and losers. The identification of a minimum level of funding for schools, representing reasonable, affordable and efficient educational provision, is arguably the single biggest challenge to emerge from the consultation.

This is not a level that refers back to current funding per se (i.e. no losers), nor is it a level that encourages inefficient practice (i.e. potentially unaffordable), but if found, the Core Pupil Resource (CPR), could ensure that all schools have an adequate level of pupil-led funding over the medium term.

The proposed basic funding elements of the NFF (lump sum and AWPU) are set at a value too low to secure financial and educational viability in schools with low levels of additional need (deprivation, low prior attainment, etc.). The integrity of the NFF is at risk because funding for additional needs is required to subsidise core provision in almost all schools.

METHODOLOGY

There is no single right answer. Our approach was to use a combination of methods to identify a range of approaches for a phase-related core pupil funding level, to which a series of policy and pragmatic judgements could be applied to reach a conclusion.

Using a range of published statistics about schools (workforce, census, spending, efficiency, etc.) a data set was compiled from a sample of schools that were efficient (top decile(s)¹¹ on the efficiency metric), good or outstanding (Ofsted judgement), low additional needs (using indicators in efficiency metric), in low funded LAs (using 2016/17 SBUFs). Spend, teacher and class size data was analysed. Raw spend data, plotted on a per pupil basis, was used to provide a reasonableness check for more complex analysis.

Conclusion 1: good and efficient schools with low levels of additional need are remarkably consistent in the ratio of teachers to pupils.

A curriculum model was developed from the strong relationship between number on roll and number of FTE teachers. User input is required, in terms of the proportion of the week that teachers are expected to teach, the trigger class size (the effective maximum class size, above which a new class is required), whether pupils are taught in year groups or mixed age classes and a factors for headship capacity and option schemes/practical group sizes.

Conclusion 2: a basic school curriculum model, based on the fundamental relationship between pupil and teacher numbers, can be developed to forecast the number of teachers a school requires given a set of inputs, determined through analysis of data on good and efficient schools and/or policy.

The model was then subjected to sensitivity testing, particularly relating to pupil numbers, recognising that classrooms have a physical capacity and year groups are rarely a neat multiple of the maximum class size. A Monte Carlo simulation was used to test the model, as well as additional sensitivity using variables for small group teaching, intervention activity, stage-not-age teaching etc.

¹¹ Top decile used for primary, top two deciles for secondary otherwise sample size was too small

Conclusion 3: the model produces results that have congruence with both the data line and the algebraic line.

Only two additional pieces of information are required to link the number of teachers to the minimum funding required: the average teacher cost and the proportion of income a school can afford to spend on teachers (after allowing for minimal spend elsewhere). These can be determined through analysis of data on good and efficient schools and/or policy, and the output can be used to determine lump sum and per pupil funding.

Conclusion 4: a lump sum and per pupil value can be determined through the “wisdom of the classroom”, an analysis of what good and efficient schools currently do.

CORE PUPIL RESOURCE – SUGGESTED VALUES

Using a set of reasonable and prudent values – upper quartile spend on teachers, lower quartile teacher cost, etc, based largely on data from 2014 to 2015, a total minimum funding requirement for schools of any size can be calculated. The data is shown in the table below:

	Average teacher cost			Proportion of spend on teachers		
	1 st Quartile	Median	3 rd Quartile	1 st Quartile	Median ¹²	3 rd Quartile
Primary	£41,124	£43,964	£46,829	44%	47%	50%
Secondary	£44,454	£46,865	£49,087	52%	55%	58%

A summary chart plotting school expenditure against roll shows that this is not a linear relationship as a result of the legitimate variance in the quantities shown in the table. A lump sum and per pupil funding method will not produce a “perfect” fit, with some schools overfunded and some not viable unless all schools are funded at or above the level of highest need. However, given a set of judgements about what is reasonable, a “best” fit can be determined.

The values for Lump Sum and AWPU given in the table in the appendix are both notional and tentative and represent a compromise funding line that will require a proportion of schools to supplement basic provision from the money allocated for deprivation etc.

Conclusion 5: a “best fit” CPR value for primary and secondary can be identified, at 2014/15 prices.

Returning to the sample data, plotting the total spend (net of locally generated income) against number on roll gives a per pupil amount for good and efficient schools. It is important to note that the data is historic and funding level calculated in this way will need to be uplifted for inflation (and reasonable efficiency assumptions) from 2014/15 to the implementation date if it is to be an honest reflection of the minimum level of funding required. It is also important to note that some of this spend will be from other grant or noncore elements of the formula and that over 60% of secondary schools spent more than their annual income in that year, drawing on reserves to balance the budget.

Conclusion 6: the data from good and efficient schools can be used as a reasonableness test for the formula, at 2014/15 prices.

COST AND AFFORDABILITY

¹² Note: 2014/15 spend data from low FSM academies within MATs, using school budget share rather than total income, returns median values of 53% for primary and 62% for secondary. These more “efficient” values have been used in the impact assessment for the simple model.

There are two issues concerning the funding in the current proposal for basic per pupil funding and the Lump Sum.

CORE FUNDING QUANTUM

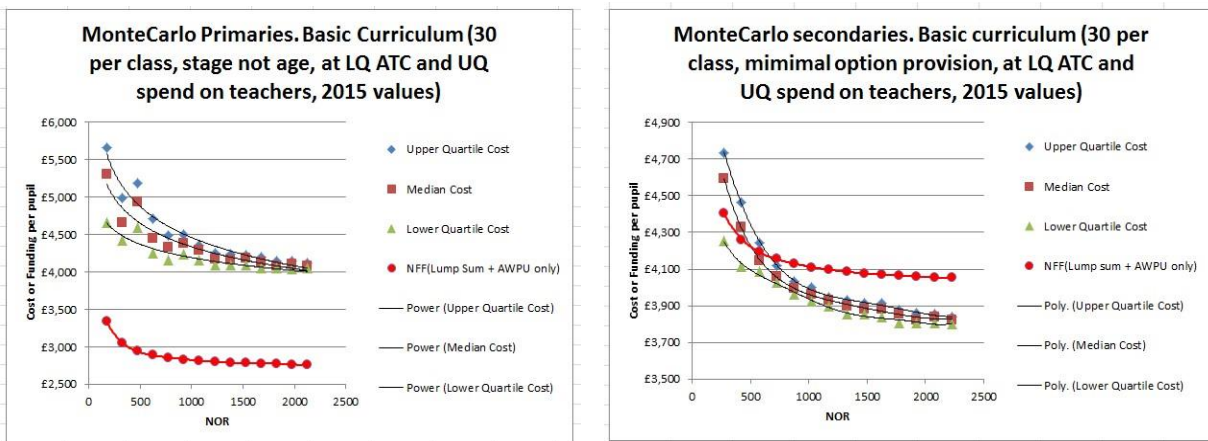
The total funding allocated to these factors is around £24.6bn. This is not sufficient for all primary and most secondary schools with NOR<500 schools to operate a basic curriculum. This is even after assuming they can operate from 2018 in the manner and at the same costs as the most efficient schools did in 2015. To offer a basic curriculum that is acceptable to parents and performance measures those schools will need to use a proportion and in some cases all of any funding allocated for Deprivation, EAL, Low prior attainment, Sparsity and any additional PPG. In essence, the sub quantum for Basic per pupil funding and Lump sum taken together is inadequate for purpose.

It is disingenuous to distribute funding under the guise of deprivation and other additional factors whilst it is clear that very significant levels of funding outside the sub quantum must to be used to allow even a basic curriculum to operate.

BEST FIT

The second issue is that the use of Lump sum and per pupil amounts, whilst it has the advantage of being simple and transparent, as a process it is over simplistic, financially very inefficient and can only provide adequate funding levels if it necessarily provides large cohorts of schools with significant disposable income and is hence inequitable.

This can easily be illustrated in our Monte Carlo modelling using a wide range of school roll numbers. For example a typical randomisation produces



Note that the maximum and minimum trend lines are not shown for clarity but they sit outside the cost envelopes shown by the upper and lower quartiles.

IMPACT ASSESSMENT

In identifying alternative levels of funding for core pupil resource, the impact has been assessed using the underlying NFF data for 2016/17. Whilst repeated modification of the Lump Sum and Per Pupil amount never solves the problem (as Einstein observed, 'Insanity is doing the same thing over and over again and expecting different results'), suggestions for a "best fit" core funding level have been tested to identify the impact on the quantum, for a given set of assumptions.

The data used is from 2014/15 and from schools with low levels of AEN. Adjusting for these factors¹³ produces the type of exemplification set out in the table below:

<i>(at 2014/15 prices plus 4%)</i>	Primary		Secondary		Total cost	Variation
	Lump sum	Per pupil	Lump Sum	Per pupil	£bn	£bn
Simple model	£58,000	£3,080	£233,000	£3,990	25.690	1.06
Theoretical model	£123,000	£3,120	£185,000	£3,690	26.015	1.39

Clearly whether any such quantity is moved out of, for example, Deprivation, EAL, Low prior attainment, Sparsity or other non-DSG grant, or comes in from outside of the core schools budget is beyond the remit of this report.

IMPLEMENTATION SUGGESTIONS

POLICY DECISIONS

Policy decisions on the following points are required to give a better estimate of the best compromise possible in the limited lump sum and fixed per pupil amount model and also to inform more accurate but complex allocation methods.

These points are

- At what point is it reasonable to teach derived years?
- What is a reasonable level of pay for a teacher ignoring any Area Cost Adjustment
- What is it reasonable for a school to spend on everything except teachers?
- What is the realistic upper limit for how many pupils you can get in a classroom?
- How many hours of suitable quality teaching can you expect from a teacher in one week?
- Do the answers to the above have ranges or specific values and how do they relate to past data and future expectations?
- What assumptions need to be made to determine the right balance between inflation and efficiency to ensure that a core funding level, once calculated, is protected and retains integrity?

RESTRICT INITIAL NFF IMPLEMENTATION TO CPR ONLY

One possible use of a CPR value would be to phase the implementation of the NFF so that the initial implementation ensured that all schools received adequate core funding through the NFF, with the remainder distributed by the LA from a funding allocation that was a mixture of historic spend, formula and transition. This aligns well with residual LA responsibilities and probably avoids the need for legislative change.

¹³ An inflation and efficiency adjustment of 4% has been used and a scaling of 10% to remove AEN funding and expenditure

This would also mirror the High Needs proposals to a degree, it would resolve the current unease about the ability of schools to resource a basic curriculum and would leave all the tricky school level funding issues with the LA, pending a suitable national solution.

The additional benefit would be that if additional needs funding allocations were still determined by the LA, in consultation with the schools forum, the flexibility between high needs and schools budget would also be manageable in the short to medium term.

DE MINIMIS GRANT

An alternative is to consider a “de minimis” grant. As actual schools are scattered between the mathematical lines in the model (see Monte Carlo diagrams in the previous section) it is possible to devise a most economical ‘de minimis’ grant level that specifically targets schools on the basis of lagged roll numbers in each year group.

We think this gives an alternative approach to a compromise solution which involves the introduction of an additional factor in the formula. This factor corrects the impact of using a low level of AWPU value for all schools by bringing any individual school to as close to a CPR value as is reasonable. It does this on an individual basis and is, as such, a variable grant and works on lagged roll number split by curriculum year where the policy decision is to have National Curriculum year teaching as an element of basic provision. A description of this model is available but outside the scope of this summary.

CONCLUSIONS

We have examined relevant data and established a really clear link (indeed a linear relationship) between teacher numbers and pupil numbers in some low funded, low AEN, good and efficient schools. It would be possible to stop there and use that evidence to build a lump sum and per pupil core funding approach for schools. We have suggested some values and looked at the impact.

However, schools are about more than just a teacher in front of a group of children and so we have built a curriculum model that also recognises that classrooms and teachers have physical capacities and that the older children get, the more choice they deserve. Using this model we have demonstrated that the relationship is more complex and a simple lump sum and per pupil funding approach would not be the most efficient, which in times of austerity is important. None the less, we have used the model to suggest a formula approach and looked at the impact.

We know that the government wants to ensure that schools have an adequate level of basic funding so that any extra funding to meet additional needs can really make a difference to those children who need it most. We know that heads and governors across the country are concerned about cost pressures over the coming years.

We recommend that the government revisits the values proposed for the AWPU and ensures that these reflect an adequate core pupil resource (CPR) and that this is both evidence-driven and policy led and is protected in real terms. We have made some initial suggestions and can assist with model development.

We recommend that the government consider an alternative to a nationally set lump sum and either delegate the responsibility to LAs in line with their duties to ensure sufficient school places in their area or that a new "Size and Year Group Adjustment" factor is added to the NFF that adjusts the CPR funding to reflect inefficient pupil numbers overall and across the school age range. The former is simpler, the latter is more efficient.

We remain committed to finding a fair and efficient way to fund schools and will continue to support the Department for Education and other stakeholders in this important work. There may not be a universally acknowledged perfect formula, however, there is a clear consensus that the current school funding methodology must change and we believe that an evidence based and policy-led solution is both possible and essential.

Sam Ellis and Susan Fielden, School Finance Specialists, March 2017

APPENDIX – SUMMARY OF INITIAL FINDINGS AND INTERIM CONCLUSIONS

Conclusion	Primary	Secondary
Good and efficient schools with low levels of additional need are remarkably consistent in the ratio of teachers to pupils (<i>suggested values shown at 2014/15 prices plus 4%</i>)	Number of FTE teachers = 0.042 x NOR + 0.79 (R ² = 0.87) <i>Adjusting the values to account for low level AEN and using data-driven assumptions, these values translate to Lump sum £53,000 and AWPU £3,080</i>	Number of FTE teachers = 0.058 x NOR + 3.39 (R ² = 0.86) <i>Adjusting the values to account for low level AEN and using data-driven assumptions, these values translate to Lump sum £233,000 and AWPU 3,970 (KS3) and £4,020 (KS4)</i>
A basic school curriculum model, based on the fundamental relationship between pupil and teacher numbers, can be developed to forecast the number of teachers a school requires given a set of inputs, determined through analysis of data on good and efficient schools and/or policy.	$T = \frac{x}{cn} + g \frac{n-1}{cn} + h + \phi$ $T = \frac{x}{cn} + h + \phi$	<p>T is a number of FTE teachers. x = roll value (at specific points¹⁴) c=teacher contact ratio n = pupil roll at which a new teaching group is triggered g = number of year groups h=headship time factor for small schools φ = FTE addition for options and practical subjects The second equation represents mixed age teaching groups, the first represents NC year group teaching</p>
The model produces results that have congruence with both the data line and the algebraic line	Using extreme values that match the equations above a sample group of schools produces a scatter of values between the theoretical extremes.	
A lump sum and per pupil value can be determined through the “wisdom of the classroom”, an analysis of what good and efficient schools currently do.	For one set of policy decisions on NC or mixed age teaching and the size of a basic curriculum model (summarized in K)	
	$A = \frac{W}{cpn}$ $L = \frac{WK}{cp}$	
	Actual lines can be used to give an equivalent value for n and p so a Lump sum and an AWPU value can be derived to match any agreed line	
A “best fit” CPR value for primary and secondary can be identified, at 2014/15 prices assuming a single lump sum and a single AWPU is used in each phase. This is not the most economical mechanism but it is within a Lump sum/AWPU approach	Lump Sum=£123,000 AWPU = £3,120 These values are very dependent on policy decisions	Lump Sum = £185,000 AWPU = £3,690 These values are very dependent on policy decisions
The data from good and efficient schools can be used as a reasonableness test for the formula, at 2014/15 prices.	Per pupil spend in 2014/15 (including low level AEN) = £3,483 (R ² = 0.92) This represents the total allocation for low AEN schools, not just the core pupil resource	Per pupil spend in 2014/15 (including low level AEN) = £4,976 (R ² = 0.91)

¹⁴ Values of x as an integral multiple of n give the lowest numbers of FTE teachers, values of x is an integral multiple plus 1 pupil for each year group give the highest number of FTE teachers assuming NC year groups are used. The lines only have meaning at the data points.