Y Comisiwn Annibynnol ar Ariannu a Chyllid i Gymru | Independent Commission on Funding & Finance for Wales

Working paper: Replacing Barnett with a needs-based formula

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Summary

- In our First Report, we recommended that Barnett should be replaced by a needs-based formula. In this working paper, we set out how this could be done, and employ a methodology for developing a needs-based formula that is derived from funding decisions of the UK Government and the devolved administrations.

- An ideal needs-based formula would be simple both to operate and understand as well as being complete, i.e. it would capture most relevant aspects of need. Our analysis has demonstrated that it is possible to replicate to a surprisingly high degree of accuracy the funding allocations of very complicated needs-based formulae using only a few key needs proxies.

- A formula for calculating relative needs across the devolved administrations that combines simplicity with a high degree of completeness and is based on real world funding allocations by the UK Government and the devolved administrations finds that Wales should receive some £115 for every £100 of funding spent on comparable activities in England. At present, Wales receives only £112 for such activities. For Scotland and Northern Ireland, the figures generated by the formula are £105 and £121 respectively, although these estimates would need refinement to take account of different devolved responsibilities.

- We propose a straightforward way of aligning relative funding with relative need in the devolved administrations over time. An assessment of the relative needs of each devolved administration would be undertaken at the beginning of each spending review period, using the simple formula. Changes to the block grant would be calculated as at present, with two key amendments.

    - Firstly, a multiplicative needs adjustment term would be added to the current funding formula that would align changes in relative funding with relative need.

    - In addition, a transition mechanism would be applied to close the funding gap between current relative funding and current relative need in a phased manner. We set out a straightforward mechanism that would achieve this objective.

Overview and purpose of the paper

1. This paper builds on the recommendation made in the Commission's First Report that Barnett should be replaced by a needs-based formula. It provides:
   - a recap of the rationale for introducing a needs-based formula to fund the devolved administrations;
   - evidence that a replacement formula could be relatively simple;
   - an example of the type of formula that could be used in place of Barnett, and one which has been derived in an impartial way;
   - an assessment of the implications of the formula for the funding of devolved government in the UK; and
   - a discussion of practical issues that would need to be addressed when implementing a needs-based formula.

2. In order to move beyond an abstract discussion and demonstrate how a new funding regime might operate, we employ a methodology for deriving a needs-based formula where the weighting given to different types of need is derived from real world spending decisions made by Ministers in Wales, England and Scotland.[1] We set out how this formula could be used to determine budgets across the nations of the UK, and we consider what the implications of this new funding system would be for the devolved administrations. The Annex provides a detailed description of our methodology. We have kept the imposition of our own judgement to a minimum in the interests of deriving a formula which encodes the "revealed preference" of current governments but we are aware that various aspects of our proposal could be challenged, and we therefore welcome comments on this paper. The estimates of relative need that our model provides for Scotland and Northern Ireland should be seen as only broadly indicative, given issues of coverage but we have greater confidence in the accuracy of the estimate for Wales given its consistency with the findings of our First Report.

3. In summary, the paper is **not** intended to be the final word on how a needs-based formula would operate; rather, its purpose is:
   (i) to demonstrate that a needs-based funding regime is eminently and imminently achievable given the political will;
   (ii) to show that such a formula need not be prohibitively complicated; and
   (iii) to provide a starting point for discussion about how a needs-based replacement for Barnett could be put into practice.

[1] Although our analysis did not include Northern Ireland, we see no reason why our proposed methods could not be extended to cover all of the devolved administrations.

Recap of the Commission's previous conclusions and the current state of the debate

4. In its First Report, the Commission concluded that the Barnett formula lacked any objective justification and had survived for 30 years for no reason other than political and administrative convenience. As a direct result of the formula, the relative funding per capita for devolved activities in Wales has converged markedly towards the average level of funding in England over the past decade for reasons that have nothing to do with the relative needs of Wales. This process of convergence has caused the funding of devolved activities in Wales to fall below what Wales would receive were its budget determined by the various formulae that the UK Government uses to allocate resources to comparable functions in England. If the Barnett formula remains in place this convergence will continue over the long term, with the funding of devolved public services in Wales moving ever-closer to the average English level of funding per capita, irrespective of higher Welsh relative needs.

5. In order to establish a fair and rational basis for determining the size of the Welsh block grant, the Commission recommended that "In the medium term the funding arrangements for Wales should be based on relative needs" (First Report, p.33). However, we also acknowledged that this could be a complex process and could take time. As an interim measure, we recommended a simple modification to the existing formula that would place a 'floor' under any devolved budget at a level indicated by English needs formulae and would prevent any further convergence, pending wider reform. We also committed to undertake analysis of how a needs-based formula might be developed, and to provide further recommendations on this matter in our Final Report.

6. Since our First Report went to press, the report of the Commission on Scottish Devolution (the Calman Commission) and the report of the House of Lords Select Committee on the Barnett formula have been published. Both reports have come to similar conclusions about the need for Barnett to be replaced by a formula that is needs-based. The Calman Commission stated, "The present system of calculating the block grant by the Barnett formula is not well related to need" (p.91) and concluded that "The block grant, as the means of financing most associated with equity…should be justified by need" (p.111). Similarly, the House of Lords select committee recommended that "A new system which allocates resources to the devolved administrations on the basis of need should be introduced" (summary). There is therefore an emerging consensus that Barnett no longer provides a suitable basis for determining the budgets of devolved administrations (if it ever did), and that its replacement should be a formula that takes account of the relative needs of each country.

7. Our First Report emphasised that the process of allocating funds on the basis of need is inherently political - it is for Ministers to decide how

needs should be taken into account when allocating budgets. This remains our position: any new funding arrangement must be implemented on the basis of mutual agreement by the governments of the UK and the devolved administrations, and a conference of politicians and experts may be an appropriate step to achieving agreement.

8. However, we are aware that in order to move the debate forward it is necessary to go beyond a discussion of principles and to produce a proposal that would work in practice and could form the starting point for a debate between governments. As the Chief Secretary to the Treasury, Liam Byrne MP stated when giving evidence to the House of Lords Committee on the Barnett formula:

"Is [the Barnett formula] my platonic ideal of equity and fairness? No, it is not. Have I seen the platonic ideal of equity and fairness? No, I have not, because what I do not want to do is to get trapped between false alternatives. At the moment there is not a choice between the Barnett Formula and another formula which is better; it is between Barnett and the kind of hypothetical [alternative], and that is where we are at the moment."

9. We do not claim to have met the Chief Secretary's first challenge - our approach is not a platonic ideal of equity and fairness. However, we have met the Minister's lesser goal: we have produced an approach that is better than Barnett. What's more, it is workable, relatively simple to operate and fair to all parts of the UK. In the remainder of this working paper, we set out our proposal.

Towards a new formula: trade-offs between simplicity and completeness

10. In our First Report, we discussed the two main characteristics of an ideal needs-based funding formula, namely:

    (i) **simplicity**: a formula should be simple to operate and understand; and

    (ii) **completeness**: a formula should take account of all relevant dimensions of relative need.

11. The objectives of simplicity and completeness are in competition with each other to a certain extent - a simple formula is one that will tend to be incomplete, while a complete formula is likely to be possible only with some loss of simplicity.

12. The appropriate balance between simplicity and completeness will vary depending on the purpose of the funding and the powers of the body to which funding is being provided, among other factors. The budgets of the UK's devolved administrations are provided as unhypothecated

block grants, and Ministers in the devolved governments have a very high degree of discretion in deciding where to allocate resources. There is little point in trying to define specific needs too precisely in these circumstances, and therefore our strong preference is that the successor to Barnett should be a relatively simple formula that provides a broad brush assessment of the main components of relative need. In other words, we favour simplicity over completeness.

13. We do not seem to be alone. After all, the current arrangements are not so much simple as procrustean. If a single variable, population, has been considered adequate to drive changes in devolved expenditure for decades, it seems a reasonable inference that a refinement using a handful of variables is to be preferred to a greater refinement employing hundreds.

How simple could a needs-based formula be?

14. In order to assess whether it could be possible to develop a simple funding formula that retained a high degree of completeness, we commissioned an econometric study that attempted to mimic the outcomes of complex funding formulae that are being employed at present using only a few needs variables (London Economics, forthcoming). This analysis aggregated the actual funding allocations for health, local government and schools expenditure in England (each of which is determined by a complex needs-based funding formula[2]), and attempted to replicate their outcomes at a sub-regional level across England using as few needs indicators as possible. Since these public services account for the bulk of devolved spending in Wales, in aggregate the budgets provide a reasonable proxy for the activities that are funded from the Welsh block grant.[3]

15. The study demonstrated that it is possible to replicate to a surprisingly high degree of accuracy the funding allocations of very complicated needs-based formulae using only a few key needs indicators. Over 90% of the variation in funding for these public services across English sub-regions could be captured using a single equation with just two needs proxies. Adding another four took the explanatory power of the equation well above 95 per cent and ensured that all observations were predicted within a 5% error band. The implication of this finding is that it should be possible to generate a simple needs based formula to replace Barnett that also retains a high degree of completeness.

[2] Schools expenditure in England was determined by a needs-based formula until 2006-07. Since that date, school budgets have been based largely on historic spend. In effect therefore, the relative allocations continue to reflect the outcomes of the pre-2006-07 needs-based formula.

[3] The scope of devolved responsibilities is not identical in Wales, Scotland and Northern Ireland. The implications of this for our proposed approach are discussed in paragraphs 25-32 and in the Annex.

Needs indicators: selection criteria

16. Our First Report considered the various competing definitions of equity and fairness that could be adopted when allocating public resources. While this debate is a political one that lies beyond our remit, there is a broad consensus that, at a minimum, public funds should be allocated in a way that makes it possible to provide a standard level of service in all parts of the UK.[4] There is however no universally accepted way of assessing how relative need varies from place to place, and there is therefore no set of needs indicators waiting to be taken off the shelf and plugged into a new needs formula.

17. It is nonetheless possible to identify in broad terms the type of needs that are relevant to the provision of devolved services and to find objective proxies for them. Population size is one obvious such driver - the more people that live in a locality, the greater the need for public services. In addition to this straightforward indicator of need, our First Report argued that the three factors most relevant to the financing of devolved activities in the UK are:

    (i) **demographics**: a higher prevalence of school age and retired people in the population will tend to increase the need for public services. Similarly, certain minority ethnic groups are disproportionately likely to experience disadvantage, so greater ethnic diversity will also be likely, other things being equal, to generate a higher need for public services.

    (ii) **deprivation**: individuals who are disadvantaged in various ways will have a greater need to access public services. For instance, a high prevalence of ill health will generate increased pressure for health-related services, while people who are not in employment or who are claiming income-related benefits are also likely to have a relatively high need for devolved public services such as personal social services and early years support.

    (iii) **costs**: the cost of delivering public services tends to be greater in areas where the population is relatively sparse. In addition, labour costs are generally higher in London than in other parts of the UK. This increases the relative cost of delivering public services in London.

18. The Barnett formula takes some account of population at the margin, but ignores all the other factors that have an impact on the need for public services. Barnett is therefore extremely simple to operate (at least in principle), though it is highly incomplete in its assessment of needs. In developing an alternative to Barnett, the goal should be to

[4] For example, this definition was adopted by HM Treasury in its 1979 needs analysis. Alternative definitions of need and equity are discussed in detail in Chapter 3 of our First Report.

capture the variations in relative need that are driven by demographics, deprivation and costs in the simplest formula possible.

19. For any formula to be of practical use, it would have to be based on data that are available on a consistent basis across the United Kingdom. Moreover, the needs indicators selected should not be under the direct influence of any devolved administration, in order to avoid incentives for 'gaming' the funding system. The indicators should also be simple to understand, measured to a high degree of accuracy and subject to periodic review. For these reasons, we have a preference for using census data where possible.

20. Table 1 summarises our proposed needs indicators[5]. Three of our needs indicators (ethnicity, ill health and sparsity) can be captured using census data. A further two indicators (the number of children and the number of retired persons) are estimated annually by the ONS, but these estimates are benchmarked to census data. The census does not include a question on earnings or wealth, which makes it very difficult to identify income-poor households from census data. An alternative indicator of low income can be derived from statistics on social security and tax credit claimants. These are based on records of all claimants and are available on a consistent basis throughout the UK. We have therefore used this data source for our measure of income poverty.

21. While the set of indicators shown in Table 1 is both intuitively plausible and consistent with our selection criteria (set out in further detail in the Annex), we do not claim that it is the only basket of proxies that could be developed for the purpose of measuring relative need across the nations of the UK. That said, we do not believe that an alternative set of proxies that complied with our selection criteria would produce radically different results from those presented in this paper.

[5] The total population of a country is obviously the single most important factor in determining its budgetary allocation. Our analysis is conducted on a 'per head' basis, which removes the need to account for this factor in the assessment of relative needs.

Table 1: Summary of indicators included in our assessment of relative needs

	Need indicator	Description of variable	Source
Demographics: indicator 1	Number of children	Under 16 dependency ratio	Mid-year estimates
Demographics: indicator 2	Number of older people	Retired persons dependency ratio	Mid-year estimates
Demographics: indicator 3	Ethnicity	Percentage of the population that is from a black or minority ethnic group	Census
Deprivation: indicator 1	Income poverty	Percentage of the population claiming income-related benefits	DWP benefits database
Deprivation: indicator 2	Ill health	Percentage of the population with a long-term limiting illness	Census
Cost: indicator 1	Sparsity	Proportion of people living outside settlements of 10,000 people or more. In addition, our equation contains a variable to take account of the remoteness of the population of the Scottish islands.	Census
Cost: indicator 2	London weighting	A variable that identifies inner London areas	N/A

Developing a needs-based formula: an impartial approach

22. In order to use the needs indicators in Table 1 to calculate funding allocations for the different countries of the UK, it is necessary to decide how much importance should be attributed to each indicator. While we could as a Commission select weights that reflected our own views as to how much importance should be placed on a region's sparsity, how much on its prevalence of ill health and so on, we would quite reasonably be accused of making judgements that lack any empirical justification or political legitimacy.

23. Instead, we have taken as our starting point the actual budgetary allocations that are made to fund devolved activities[6] across the countries of Great Britain.[7] These real world funding decisions are based on assessments of need that have been thrashed out over years and reflect decisions that are the responsibility of elected officials. We therefore take them as representing the 'revealed preference' of governments.

24. Where possible, we have used funding allocations before the application of smoothing or damping procedures. This is because we are trying to identify budgetary decisions made on the assessment of need, rather than the practical reconciliation of such assessments with historical allocations.

25. In each country the local government funding regime is devolved and takes account of the ability of local authorities to raise their own resources via the council tax. However, this is not done on a consistent basis across countries, and the defined tax base in different areas bears no relation to the taxable capacity as indicated by house prices. We believe that a needs-based funding regime for the devolved administrations would have to take some account of variations in taxable capacity across countries, although a number of possible mechanisms for doing this can be envisaged, none of which is self evidently 'correct'. In order to preserve the simplicity of our approach, we have therefore made no adjustment to local government funding allocations to account for differing taxable capacities, beyond that which is incorporated in the allocation formulae of each nation. In the Annex, we discuss one way of modifying our methodology to account for variations in taxable capacity, and show that adoption of this approach would generate a somewhat higher estimate of relative needs in Wales and the other devolved administrations than is obtained from the unadjusted data.

26. Using regression analysis, we are able to calculate how important each of the indicators in Table 1 is in determining the budgetary allocations. This technique generates a weight for each needs indicator that is based on its importance in explaining real world spending decisions made by the UK Government and the devolved administrations in Wales and Scotland.[8] [9]

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[6] The analysis covers the combined budgets for health, education, local government, Sure Start and Supporting People. In aggregate, these activities account for approximately 80% of the budget that is devolved to Wales.

[7] Our analysis of expenditure covers Wales, England and Scotland, though it could be extended to Northern Ireland.

[8] To the extent that governments in different countries disagree in their assessment of the relative importance of the various aspects of need when allocating resources, this is taken into account. In effect the weight given to each country's preferences is proportional to its population.

[9] We have not included a variable to take account of the prevalence of the Welsh language in our analysis, although arguably we should have done so. The Welsh Language Act (1993) requires public services in Wales to be provided in both Welsh and English 'on a basis of

27. In reality the formulae used to allocate resources across GB are varied and complex. However, our regression analysis has found that the simple need proxies in Table 1 are extremely effective at modelling real world funding allocations: the proxies are able to explain well over 90% of the variation in funding across sub-regions of Wales, England and Scotland. This provides confidence that they are effective in modelling government and implicitly societal preferences and therefore provide a reasonable basis for determining the funding needs of the devolved administrations.

28. This approach has enabled us to derive an equation to calculate the relative needs of the nations of the UK that requires us to make minimal independent judgements and is derived from actual spending allocations in the three countries. The formula we have developed is both simple (it contains only the need factors set out in Table 1) and also has a high degree of completeness (its strong explanatory power when applied to sub-regional funding allocations implies that it captures the relevant aspects of need). A more detailed explanation of how our needs formula was calculated is provided in the Annex.

Implications of the formula for the funding of the devolved administrations

29. The needs formula introduced above combines the needs indicators set out in Table 1, weights each one in proportion to its importance in determining spending decisions in Wales, England and Scotland, and generates an overall relative need value for the countries of the United Kingdom. If applied to Wales, the formula produces an overall estimate of Welsh relative need of some 115 per capita, where England = 100. This suggests, based on the relative needs of Wales and the importance attached to those needs by the UK Government and the devolved administrations, that Wales should receive £115 per person to spend on devolved activities for every £100 per person spent on comparable activities in England.[10]

30. In our First Report, we calculated the funding that Wales would receive from the UK Government were it treated as a region of England. We concluded that Wales would receive at least £114 per person for every £100 of comparable English spending. The fact that both of the approaches we have adopted have arrived at very similar estimates of Welsh relative need provides confidence in the accuracy of our methodology. In producing the estimate in our First Report, we deliberately adopted methods that were "certain to produce a conservative overall estimate, and likely to generate an underestimate

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equality'. This generates an additional need to spend on certain public services in Wales, notably education, analogous to ethnic diversity.

[10] Expressed to one decimal place, the regression estimate is 114.6. We have rounded this estimate to the nearest whole number.

of Welsh relative needs." (First Report, p.47) It is therefore unsurprising that the estimate of Welsh relative needs generated by our formula is a little higher than the estimate that was provided in our First Report. As explained in the Annex were we to standardise measures of tax capacity of local authorities the estimate would rise appreciably further.

31. Scottish areas were included in the calculations to derive the needs formula and, if applied to Scotland, the formula generates an estimated need to spend £105 in Scotland for every £100 spent per person in England for the same "basket" of devolved government functions. However, it should be noted that the functions devolved to Scotland are different from those devolved to Wales. Most importantly, law and order and justice are devolved in Scotland, but not in Wales, as are the proceeds from the non-domestic rating system. As a result, the programme areas covered by the allocations used to derive our needs formula are not as closely aligned with the block grant for Scotland as they are for Wales. The relative needs estimate for Scotland would therefore require adjustments, but as they stand are broadly indicative.[11]

32. Expenditure data from Northern Ireland were not included in the process of estimating weights for each needs indicator, however the indicators are available on a consistent basis and applying the same formula to Northern Ireland generates an estimated need to spend £121 for every £100 spent per person in England on devolved activities. For similar reasons as those set out above in relation to Scotland, this result should be seen as only broadly indicative for Northern Ireland.[12]

33. Chart 1 shows in graphical form that five of the six need factors contained in the needs assessment formula are higher in Wales than in either England or Scotland:[13] ethnicity is the only need factor that is higher in England than in Wales. Four of the six need factors are higher in Northern Ireland than in the other three nations, the exceptions being the number of pensioners and ethnicity.

[11] The Scottish crime rate was 2,615 per 10,000 households in 2007-08, which is somewhat lower than the rate in England and Wales over the same period (2,720 per 10,000 households). Similarly, the prison population in Scotland (1.44 per 1,000 population) is lower than the comparable England and Wales figure (1.48 per 1,000 population). While not conclusive, this suggests that the costs associated with devolved policing and justice are unlikely to result in a major upward revision of the estimated relative needs of Scotland.

[12] Policing and justice are not devolved to Northern Ireland at present, though this is currently being discussed by the Northern Ireland Executive and the UK Government.

[13] Chart 1 replicates an approach to graphically illustrating a range of needs indicators that was adopted by the House of Lords select committee on the Barnett formula.

Chart 1: Distribution of needs across Wales, England and Scotland

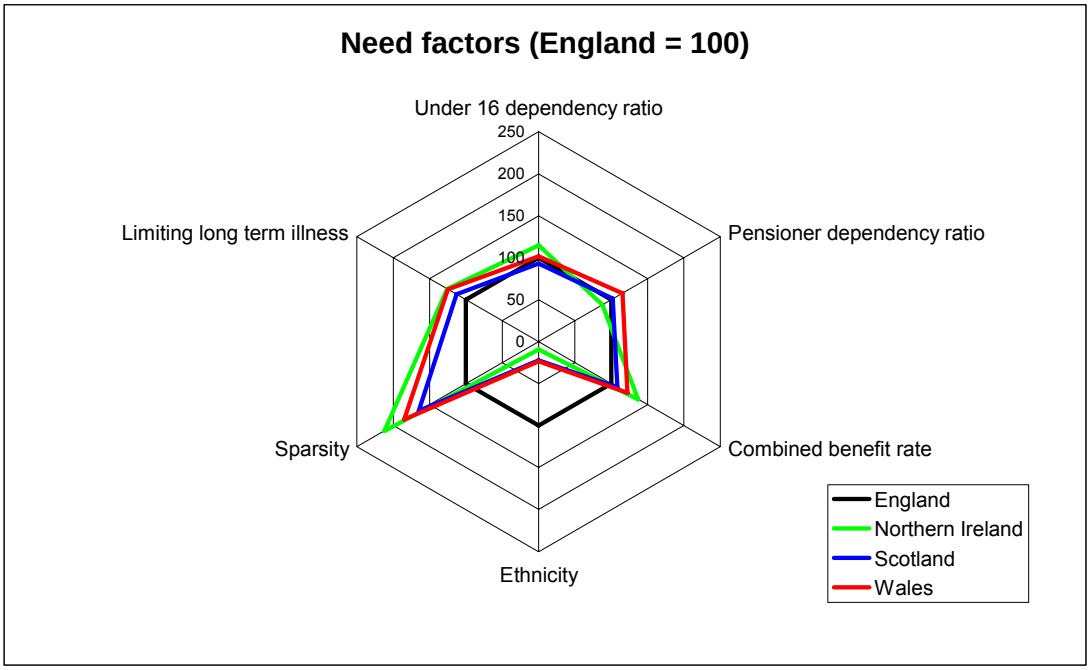
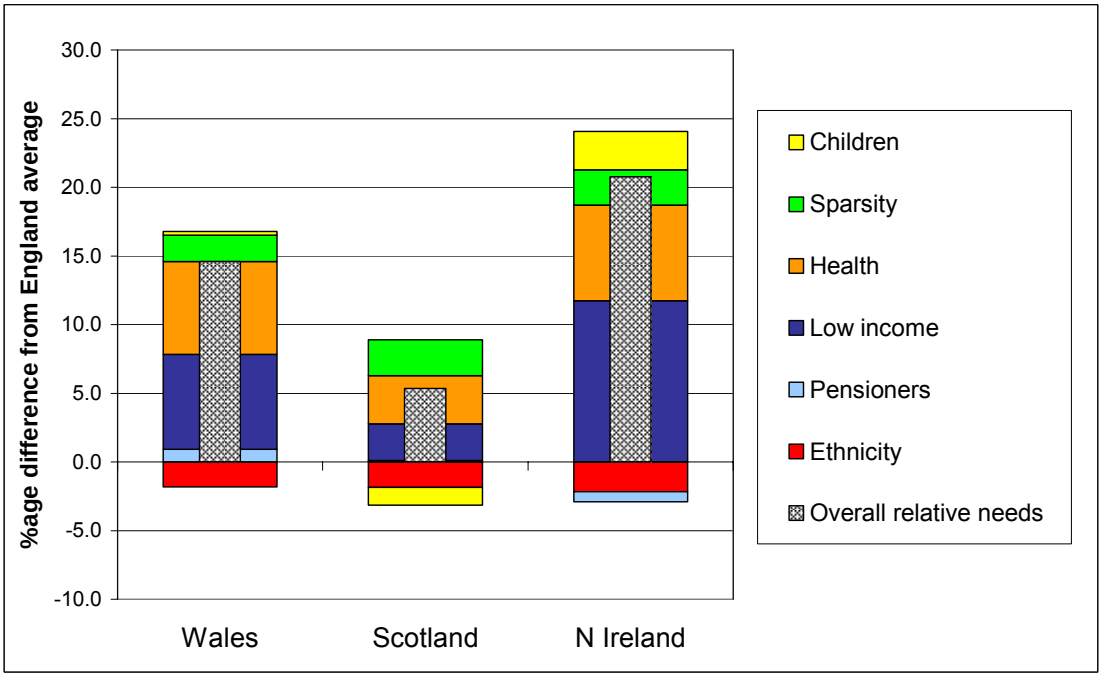


Chart 2: Weighted expenditure need per head by need factor, difference from England average



34. Chart 2 shows how important each of these needs indicators is in deriving the overall needs value for Wales and the other countries of the UK. Although all three of the devolved administrations are considerably more sparse than England (as shown in Chart 1), this is a relatively minor factor in determining spending allocations and therefore carries a relatively small weight in the overall calculation of

needs as illustrated in Chart 2. Ill health (proxied by limiting long term illness) and income poverty (proxied by the combined benefit rate) are the indicators that contribute most to the high estimate of relative needs in Wales. Box 1 provides a summary of how we developed our needs formula.

Box 1: Developing a simple assessment of relative needs across the UK: a summary of our approach

Our commissioned research examined the funding allocations made to sub-regions of England to support health, education and local government activities. Although these allocations are generated by very complicated needs-based formulae, the research found that it is possible to explain a very high proportion of the variation in these real world funding decisions using only a handful of needs indicators.

We extended this analysis to include funding allocations made to sub-regions of Wales and Scotland, as well as England. Once again, we found that it is possible to capture a very high proportion of the variation in funding across Great Britain using only a few needs indicators (listed in Table 1, and chosen in line with the selection criteria in paragraphs 16-21). Our analysis demonstrates how important each need indicator is in determining the distribution of funding; in other words, it provides a weighting for each element of need, based on real world funding allocations in Wales, England and Scotland.

The needs indicators can then be aggregated using the weights derived from our analysis in order to determine an overall value of relative need for each country. We find that, for Wales relative need per capita is 115 (where relative need in England is 100). In Scotland, the formula generates an estimate of relative need of 105, while in Northern Ireland it is estimated to be 121. The estimates for Scotland and Northern Ireland should be viewed as broadly indicative.

Putting a new formula into practice

35. The process described above leads us to conclude that the formula we have developed could underpin a needs-based funding system for the devolved administrations. In this section, we set out the main practical steps that would be required to put such a system in place.

36. Our First Report argued that an arm's length body should be established to operate the new funding formula and to calculate annual budgets. This remains our view. It is highly desirable that the technical aspects of the funding regime, as opposed to final political decisions, should be, and be seen to be, managed independently of the parties that provide or receive funding.

37. The new funding formula should ensure that each area receives an allocation reflecting its needs relative to other areas. In the interests of maintaining as much continuity as possible with current procedures, which apply the Barnet formula to changes in public expenditure, we propose applying the new approach similarly. Then it has to fulfil two criteria, namely:

    (i) it should ensure that changes in relative funding are aligned with relative needs; and

    (ii) it should provide a mechanism to redress any over- or under-funding.

38. In the remainder of this section, we set out how these objectives could be achieved.

(i) Aligning funding changes with relative needs

39. At present, the devolved administrations receive an unhypothecated block grant that is carried over from one year to the next. Changes to the grant (known as 'consequentials') are determined by the Barnett formula, which is given in Equation 1 below:[14]

    Change in block grant = change in English spend
    x population share
    x comparability factor (1)

40. We have sought to develop a mechanism that aligns relative funding with relative needs while also retaining the simplicity of Barnett. A subsidiary requirement may be to minimise changes to current procedures. With these objectives in mind, we propose that the current approach should be maintained for the calculation of increments, with the inclusion of a **needs adjustment term** in Equation (1) to ensure that funding consequentials are set at a level appropriate to the relative needs of each nation. The needs adjustment term would simply be equivalent to the relative needs of each devolved administration as calculated by a relative need formula with variables like those set out in Table 1. In the case of Wales therefore the needs adjustment term would initially be set to 115%.

41. Since our proposed approach for assessing relative needs is straightforward, it would in principle be possible to update the value of the needs adjustment term annually. However, in the interests of maintaining a regime that provides for stable and predictable budgets we propose that the needs adjustment terms for each country should be fixed for the duration of each spending review period (i.e. for three

[14] Chapter 2 of our First Report provides further detail on the operation of the Barnett formula.

forward years). Within each spending review period, the new formula for calculating changes to the block grant would be:[15]

Change in block grant = change in English spend per head
x Welsh population share
x comparability factor
x needs adjustment term (2)

(ii) Closing the funding gap

42. As previously stated, our proposed needs formula estimates that Wales should receive £115 of funding per head for every £100 per head spent on devolved activities in England. If the overall level of funding for devolved functions in Wales happened to be at this level when the new funding regime was introduced (and assuming no change in relative populations), then equation (2) would provide increments to Wales that were in line with Welsh relative needs and would maintain the overall funding position for Wales in its correct place. No further change to the funding formula would be required; Wales would receive its normal Barnett-style consequentials, multiplied by 115 per cent.

43. In practice, it is certain that when the formula is introduced, there will be a gap between the needs target derived from the needs assessment formula and actual level of funding received by each country. For example, we know that at present Wales receives around £112 for every £100 spent on devolved activities in England. In other words, on the basis of the needs formula described above Wales is estimated to be under-funded by £3 for every £100 spent in England. This amounts to over £400 million of under funding in 2010-11. We would expect such a **funding gap** to be eliminated over a period of time rather than all at once and the overall formula would therefore include a **transition mechanism** to ensure that relative funding approached the needs target in a predictable way over a reasonable time period.

44. A simple approach to devising a transition mechanism would be to add a set proportion of the funding gap to the overall settlement each year, in addition to the budgetary changes that result from equation (2). In the case of Wales, where current funding falls below relative need, this transition mechanism would result in an additional sum being added to

[15] Under the current funding system, changes to the Welsh and other block grants are driven by changes in comparable English programmes. It could be argued that this approach is inappropriate for a devolved body with its own priorities and democratic mandate. An alternative procedure could be envisaged that would end the detailed use of comparability factors and would instead link changes in the block grants to a broader metric such as the growth in overall UK public spending. This may have some merit on the grounds of simplicity (since detailed comparability factors for each budget would no longer be required), although it would be a significant change to the current funding system. We are not persuaded that there is a clear case for moving away from the current approach at present, but we propose that the arm's length body should review this matter to assess whether a simpler alternative system could be introduced.

the Welsh block grant each year until relative funding and relative need were equivalent. If a country's relative funding were above its relative need at the start of the new funding regime, the transition mechanism would subtract resources from the block grant until parity between needs and funding were achieved.

45. Our proposed funding formula, combining needs-based increments with a transition mechanism to close any funding gap, can therefore be expressed as follows:

Change in block grant = (change in English spend
x Welsh population share
x comparability factor
x needs adjustment term)
+ transition mechanism to account for any discrepancy between the needs-based assessment and the last block grant (3)

46. The transition mechanism should ideally be the same for all the devolved authorities but should be sufficiently flexible in form to allow adjustment to occur at speeds appropriate to each. Since the funding gap for Wales is relatively modest in the context of total UK public expenditure, it should be feasible to align relative funding and relative need over a fairly short period of time. The situation could be different in other devolved administrations - a country with a large funding gap might require a rule that prevented impractically large year on year reductions. In the Annex we consider the design of the transition mechanism along with a discussion of other technical issues.

47. While this system could operate effectively over several spending review periods, it would need to be subject to periodic review to ensure that the process of assessing relative needs continues to provide a fair reflection of needs across each devolved administration. We propose that once per decade the needs assessment formula set out in Table 1 should therefore be reviewed, with any amendments being subject to agreement of the UK Government and the devolved administrations. Since many of the variables in our needs assessment formula are derived from the census, it would make sense for the review to occur shortly after the publication of the latest census data.

Conclusions and recommendation

48. We do not claim that the approach set out above provides a definitive solution to the problem of how best to design a needs-based funding system for the devolved administrations. It is possible to dispute our choice of needs indicators, and the weights attributed to them by our methodology. The details of how funding formulae should be amended to incorporate a needs element, and the design of the transition mechanism to address funding gaps, could also be challenged. And of

course, it is ultimately for politicians to decide on the way in which needs should be reflected in budgetary allocations. That said, we believe that the approach we have proposed has much to recommend it as a starting point for discussion - it is impartial, objective and fair to citizens across the United Kingdom. Box 2 summarises our proposal.

Box 2: Implementing a needs-based replacement for Barnett: key steps

1. Calculate the relative need for each of the devolved administrations of the UK, using the formula described in Table 1. Our analysis has shown that, for Wales, the formula generates a relative need of 115 compared to an English average of 100. This provides a needs adjustment factor for Wales of 115%, which is fixed for the three year period covered by each spending review.

2. Calculate changes to the block grant over the period of the spending review by applying the needs adjustment factor as set out in equation (2). This process ensures that increments to the Welsh block grant are aligned with relative need and provides the basis of the Welsh budget for the next three years.

3. Compare the estimated relative need with overall relative funding at the start of the spending review period to calculate the funding gap for each devolved administration. Wales currently receives £112 per head for every £100 spent on comparable functions in England. Since the needs assessment formula estimates that Wales should receive £115 per head for these activities, Wales is therefore under funded by around £3 per head for every £100 spent in England, which is equivalent to around £400 million in cash terms. The funding gap is therefore £400 million. This would be closed in a phased way by increments over an agreed number of years.

4. At the start of the next spending review period, the needs formula is updated with latest values. This provides a new needs adjustment factor for each devolved administration. Once per decade, the needs assessment formula itself should be reappraised jointly by the UK Government and the devolved administrations.

5. Other devolved administrations would have their budgets determined in the same way, through a combination of (i) needs-based increments and (ii) a transition mechanism to redress under or over funding in a phased way. In the event that a country faced a very large funding gap, we propose a rule that would limit the scale of budgetary reductions in the absence of growth in overall spending in order to avoid excessive budgetary shocks.

Recommendation:

The Assembly Government should pursue the introduction of a simple needs-based formula as the means of determining the Welsh block grant.

Annex

Explanation of the formula to assess relative needs

Introduction

A1. The key to developing a funding formula based on a small number of needs variables is in determining the importance of each variable in the overall allocation of funds. We have adopted an empirical approach to this issue by estimating how much variation in current expenditure allocations across geographical areas is explained by the indicators.

Approach

A2. The Treasury publishes detailed public expenditure statistics for the three devolved administrations and the nine English regions. However, the variation in expenditure allocations across these 12 areas does not provide enough information to estimate the relative importance of the needs indicators. There are also complications around identifying expenditure programmes which are devolved and are therefore covered by the block grant.

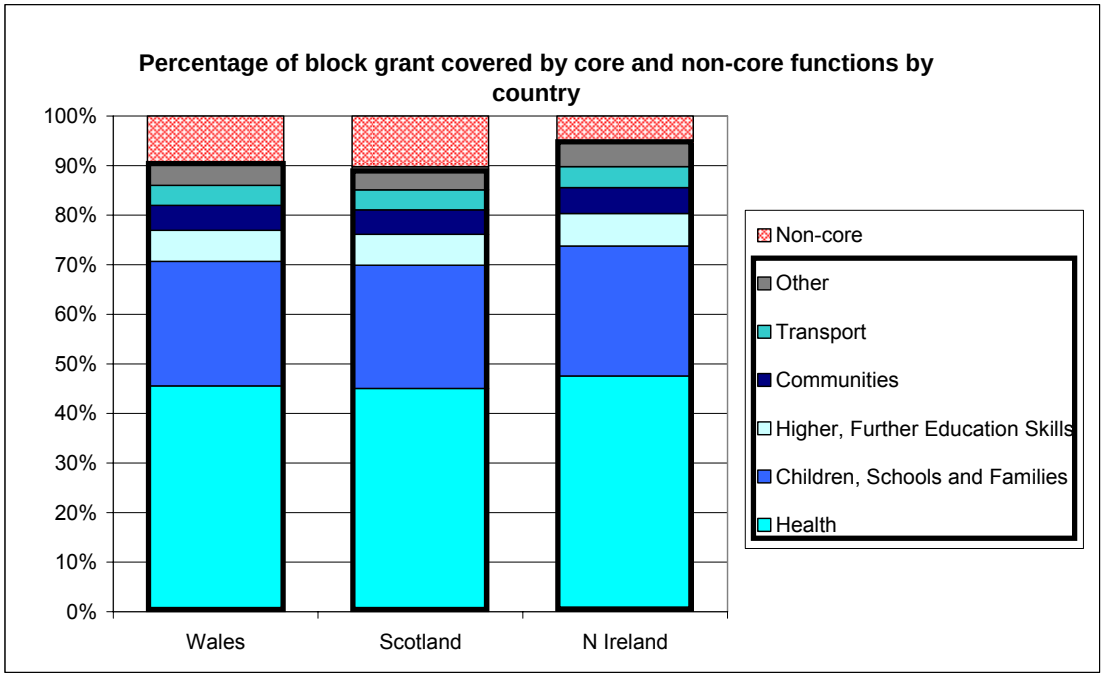
A3. Instead, we have used expenditure allocations across major devolved programmes where budgets are determined at a lower geographical level. Specifically, for England, we have combined National Health Service, Local Government, Schools grants, Sure Start and Supporting People for 2010-11. These are determined at Primary Care Trust, Local Authority and Local Education Authority level respectively. Some areas have had to be combined in order to produce a set of geographies for which expenditure allocations can be identified across all 3 programme areas. Overall this enabled us to produce a consistent set of allocations across 137 areas in England. We have also compiled expenditure allocations for geographical areas in Wales and Scotland across comparable functions. There are 8 areas in Wales and 14 in Scotland, roughly representative of each country's relative population size compared to England.

Applicability to devolved budgets

A4. The UK operates a system of asymmetric devolution, with a different range of public services under the control of the devolved administrations in each country. The programme areas covered by our approach (health, local government and schools) account for around 80 per cent of devolved services in Wales. The equivalent proportions for Scotland and Northern Ireland are around 70 and 75 per cent respectively. Our analysis therefore generates a somewhat more accurate estimate of relative needs for Wales than it does for the other devolved administrations. An alternative way to express the differing budgetary responsibilities in each devolved administration is to categorise expenditure into 'core' and 'non-core' functions, where core

functions are those that are devolved in all three countries. Chart A1 shows that, despite the differences in devolved responsibilities, core functions account for 90% or more of the English expenditure programmes for which each nation receives Barnett consequentials.

Chart A1: core and non-core functions in each devolved administration



Choice of needs indicators

A5. The number of variables that could arguably be said to capture some aspect or other of need is very large. When identifying an appropriate set of needs indicators for use in our analysis, we restricted our search to those needs indicators that are associated with demographics, deprivation or cost, which are in our view the main dimensions of need that are relevant to the funding of devolved public services. In addition, we considered only variables that are:

- available on a consistent basis across the UK;
- not under the direct influence of any devolved administration;
- simple to understand;
- measured to a high degree of accuracy; and
- subject to periodic review.

A6. As further constraints, we stipulated that when combined in a regression, each indicator should be statistically significant and that the sign of the estimated coefficient on each term should be consistent with 'common sense' expectations. For example, higher deprivation would be expected to lead to an increased need to spend on devolved

services, and therefore an indicator of deprivation should have a positive coefficient in the regression.

A7. The indicators used in our analysis are consistent with these criteria, although we are aware that the criteria are not in themselves sufficiently restrictive to limit the set of possible indicators to the extent that only a single indicator could be selected for each aspect of need. We have not undertaken an exhaustive search of all combinations of needs indicators that could fulfil our criteria - no doubt a case could be made for using a different set of need proxies. In the specification search that we did conduct, the selected regression had the best fit of those which fulfilled all the other criteria. We are confident that a different set of indicators that met each of our selection requirements and explained an equal amount of variation in spending allocations would not generate an estimate of Welsh relative need that was radically different from the one presented in this paper.

Adjusting the expenditure data: (i) damping mechanisms

A8. The purpose of this exercise is to generate an unbiased estimate of relative need to spend on devolved public services that is grounded in the budgetary allocations made across Wales, England and Scotland. In order to do this, an adjustment has to be made to the 'raw' expenditure data that are obtained from the needs-based funding formulae currently in use. Wherever possible we have removed the impact of smoothing or damping mechanisms whose purpose is to provide a transition path from historic allocations towards the needs-based funding target. We have done this because for this exercise we are interested in the assessment of relative needs provided by a funding formula, not how this interacts with historic allocations in any particular country.

Adjusting the expenditure data: (ii) accounting for variations in taxable capacity

A9. The local government funding regime is devolved in each country, and takes account of the varying ability of local authorities to raise their own resources via council tax. The expenditure data we are analysing therefore includes an adjustment for taxable capacity. However, this adjustment is not undertaken on a consistent basis across countries. As stated in the main paper, we have not made any adjustment to the formula allocations to reflect variations in taxable capacity, beyond those included in the allocation formulae of each nation. We have simply taken the funding allocations generated by the formulae (net of damping mechanisms) to derive our measures of relative needs for each country. This preserves the simplicity of our approach and also ensures that the results are clearly derived from the 'revealed preferences' of real world budgetary allocations.

A10. However, in our view the needs-based funding regime for the devolved administrations should assess variations in the ability of each nation to raise its own resources in a consistent way[16]. A practical way of doing this would be to proceed by assuming that each country makes an equal tax effort relative to current property prices. Such an approach could be incorporated within our methodology by adjusting the part of each country's local government funding formula that takes account of local taxable capacity to reflect this principle.

A11. The inclusion of an adjustment for variations in taxable capacity relative to house prices would increase the relative needs of the devolved administrations: for Wales relative needs increase from 115 using unadjusted data to 116 when the adjustment is included, while for Scotland and Northern Ireland the figures move from 105 to 106 and from 121 to 124 respectively. In our view, a strong case could be made that such an adjustment gives a purer estimate of relative need than is obtained by basing the analysis on unadjusted expenditure data. However, on the grounds of simplicity, and to avoid any suspicion of special pleading, we decided to focus on the results derived from the unadjusted data.

Formula results

A12. A cross-sectional multiple regression analysis was carried out for the 159 geographical areas referred to above. The overall expenditure allocation per head of the population was used as the dependent variable, expressed as a proportion of the average allocation per head for England (with England=100). The high level need proxies described in Table 1 of the main chapter were included as explanatory variables. These were also expressed as proportional differences from the England average. The results of this regression are set out in Box A1. All of the need proxies are assigned weights which are significant at the 95 per cent level. In other words, all of the need proxies are found to explain a statistically significant part of the variation in expenditure allocations across the 159 geographical areas. Overall, the need variables were found to explain over 95 per cent of the variation in expenditure allocations per head across Great Britain on the programme areas covered.

A13. In addition to the needs variables described in Table 1 of the main chapter and in Box A1, there were 2 additional dummy variables applied to all Welsh and all Scottish areas respectively. These dummies were included for two reasons.

- Firstly, the allocations for Welsh and Scottish areas are subject to a different overall budget constraint than those for English areas. The current block grants to the devolved countries are not based on an assessment of need but on the accumulated application of

[16] A consistent way of measuring tax capacity becomes all the more important if sub-national authorities are given the power to levy their own taxes.

the Barnett formula. In addition, within their overall block grant, the Welsh and Scottish Governments are free to make bigger or smaller allocations to these functions taken together than the UK government does for England.

- Secondly, the exact programme coverage of NHS, local government, and schools grants will vary across the three countries. For example, in Wales the NHS allocations do not include the programmes covered by Health Commission Wales, as these are budgeted on an all-Wales basis. Any such variation will be captured by the dummy term.

Box A1: Simple needs-based formula

Spend per head	= 99.6	+ 0.19 Under 16 dependency ratio	(4.73)
		+ 0.06 Pensioner dependency ratio	(2.41)
		+ 0.32 Combined benefit rate	(9.48)
		+ 0.02 Ethnic minority rate	(4.76)
		+ 0.02 Sparsity rate	(4.36)
		+ 0.28 Limiting long term illness rate	(4.72)
		+ 0.11 Inner London areas	(5.96)
		+ 0.87 Scottish island areas	(28.2)

(t-statistics shown in brackets)

Adjusted R^2 = 0.962

Where the following variables are included in the formula as a percentage difference from the England average:

Under 16 dependency ratio - resident under 16 year old population divided by the working age population. (2008 mid-year population estimates)
Pensioner dependency ratio - resident population over statutory retirement age divided by the working age population. (2008 mid-year population estimates)
Combined benefit rate - number of key working age benefit claimants plus children in out of work families claiming tax credits plus guarantee only pension credit claimants, divided by the resident population. The number of benefit claimants is averaged over 2008. (Department for Work and Pensions, HM Revenue and Customs, and mid-year estimates)
Ethnic minority rate - number of non-white residents as a percentage of the whole population. (Census 2001)
Sparsity rate - Number of people living outside settlements of 10,000 or more as a percentage of the whole population. (Census 2001)
Limiting long term illness - Age-standardised number of residents with a limiting long term illness as a percentage of the whole population. (Census 2001)

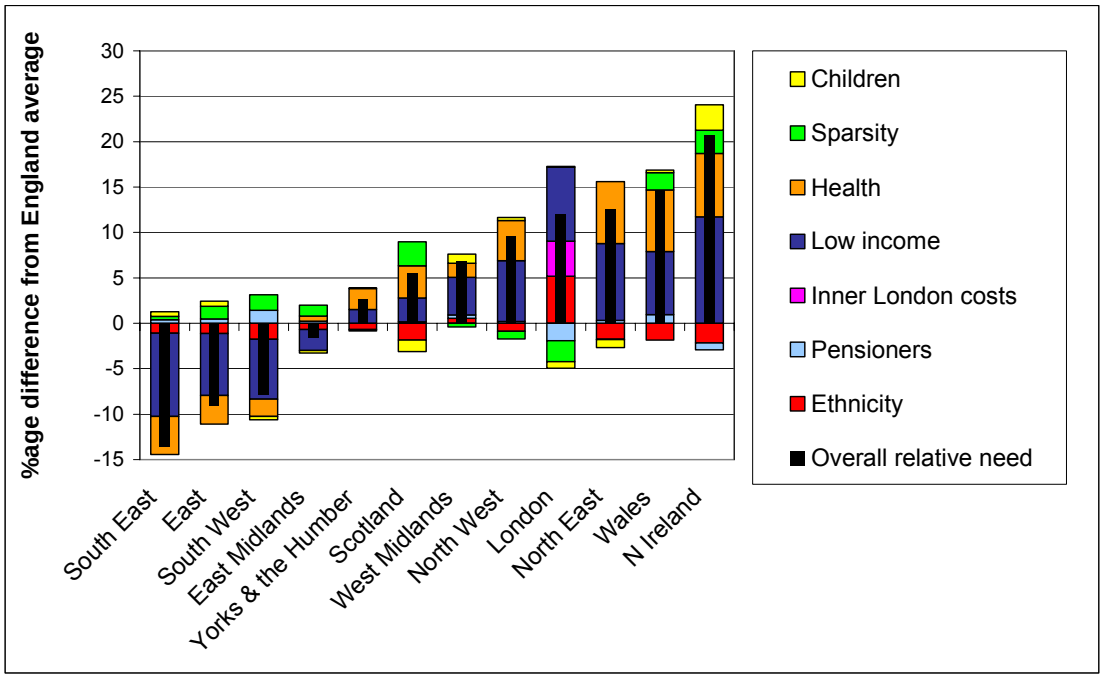
The two area-based variables for Inner London and the Scottish Islands are dummy indicators.

A14. The reported results for Wales and Scotland exclude the weights attributed to these dummy variables. They therefore reflect relative need across the geographical areas in these countries, excluding the influence of differing budget constraints and programme coverage.

A15. Chart A2 shows the formula contribution of each variable to overall need for the English regions as well as the devolved countries, this is an expanded version of Chart 2 in the main text. Overall relative need per head in Wales is close to that in the North East of England, although a little higher because of greater sparsity and a higher proportion of children and pensioners.

A16. Detailed statistics relating to the regression analysis are included at the end of this Annex.

Chart A2: Weighted expenditure need per head by need factor, difference from England average



Transition mechanisms

A17. Our proposed transition mechanism takes a simple linear form:

Annual adjustment = 1/T (needs target - funding at start of spending to block grant review) (A1)

A18. If such a mechanism were introduced for Wales from the beginning of the next spending review period in 2011-12, it would operate in the following way:

- The funding gap would be estimated on the basis of relative funding in 2010-11.

- Assuming a needs target of 115 (with England=100) and funding per head in 2010-11 of 112, the funding gap is therefore 115-112, or £3 per head for every £100 spent in England on devolved services. This equates to around £415 million, given a block grant of £15.5 billion in 2010-11.
- Equation A1 allocates a proportion, depending on the parameter T, of this funding gap to the Welsh block grant each year from 2011-12 to 2013-14.
- In 2014-15, relative needs in Wales would be re-assessed. Any remaining or new funding gap would be treated in the same way over the subsequent spending review period. Eventually the historic gap would be eliminated.

A19. If a country faced a very large funding gap, any attempt to eliminate it over a short period would produce excessive budgetary instability and would prove especially challenging under prospective conditions of budgetary stringency. It could be particularly problematic if the country were significantly over-funded when the new funding regime was introduced (i.e. the transition mechanism was reducing the size of the block grant). In such circumstances, we propose that the above approach should still be followed, but with an amendment - a switch to turn the adjustment off in certain circumstances. Consider a case where the transition period had been set at, say, ten years. The transition mechanism could then be expressed as:

Annual adjustment = switch*1/10 (needs target - funding at start of spending review) (A2)

Algebraic representation of the proposed new funding mechanism

A20. Our proposed funding formula can be expressed as:

Change in block grant = Needs-adjusted increments + transition mechanism (A3)

which can be represented algebraically as:

$$\Delta W_t = \Delta E_t N + \alpha/T (E_0 N - W_0) \quad \text{(A4)}$$

where:

W_t = block grant per head
E_t = comparable expenditure per head in England
N = needs factor
T = transition period
E_0, W_0 = expenditure per head in England and Wales respectively at the beginning of the review period.
α = switch to turn off transition mechanism in the event of negative increments and overfunding.

A21. If overall spending on devolved activities were to fall in England, or fail to grow, then the transition mechanism operating on those devolved administrations in a position of overfunding should be suspended. This would avoid punitive year-on-year budgetary reductions arising from negative needs-adjusted increments combined with negative transition adjustments. This condition can be expressed algebraically as set out in (A5) below:

$$\text{If } \Delta E_t \leq 0, \text{ and } E_0 * N < W_0 \text{ then } \alpha = 0 \qquad \text{(A5)}$$

Accounting for shifts in relative population

A22. Relative population movements have two impacts on relative expenditure per head. A smaller relative population reduces the size of the increments but also means that the overall budget will be spread across relatively fewer people. It is therefore necessary to account for shifts in relative population in order to ensure that relative need and funding are properly aligned.

A23. Under our proposed approach, shifts in relative population would be taken into account every three years as part of the recalculation of relative need. Movements in relative population will in any case be relatively modest over this time scale, therefore the simplest approach is to assume fixed relative populations over each three year period in order to ensure that our formula provides predictable budgets.

Detailed regression statistics

A24. The statistics and charts below relate to the regression analysis underlying the simple needs formula discussed in the main chapter and described in more detail in Box A1. The dummy variables for Wales and Scotland do not represent under- or over-spending relative to needs, but also reflect allocation and definitional differences discussed in paragraph A13.

Analysis of Variance					
Source	**DF**	**Sum of Squares**	**Mean Square**	**F Value**	**Pr > F**
Model	10	7.25176	0.72518	402.67	<.0001
Error	148	0.26654	0.00180		
Corrected Total	158	7.51830			

Root MSE	0.04244	**R-Square**	0.9645
Dependent Mean	1.08346	**Adj R-Sq**	0.9622
Coeff Var	3.91683		

Parameter Estimates				
Variable	**Parameter Estimate**	**Standard Error**	**t Value**	**Pr > |t|**
Intercept	0.996	0.004	246.09	<.0001
Under16 Dependency Ratio	0.190	0.040	4.73	<.0001
Pensioner Dependency Ratio	0.061	0.025	2.41	0.0173
Combined Benefit Rate	0.317	0.033	9.48	<.0001
EthnicMinority	0.024	0.005	4.76	<.0001
Sparsity	0.023	0.005	4.36	<.0001
Limiting long term illness	0.275	0.058	4.72	<.0001
Inner London dummy	0.107	0.018	5.96	<.0001
Island dummy	0.867	0.031	28.19	<.0001
Wales dummy	-0.072	0.018	-4.07	<.0001
Scotland dummy	0.218	0.015	14.45	<.0001

Residuals

A25. Chart A2 shows the regression residuals for the 159 areas across Great Britain, colour coded by English region or devolved country. The single biggest residual is for the Highland area in Scotland, where expenditure allocations are higher than the various needs variables would suggest. It may be that the sparsity variable does not fully capture the need to spend on the small population spread across this large geographical area. In general, the residuals for individual areas tend to be larger in Scotland, Wales and London. This is not surprising for areas in the devolved countries; they are subject to different allocation formulae from those operating in England, while the English formulae will have a greater influence on the regression analysis.

Chart A2: Regression residuals

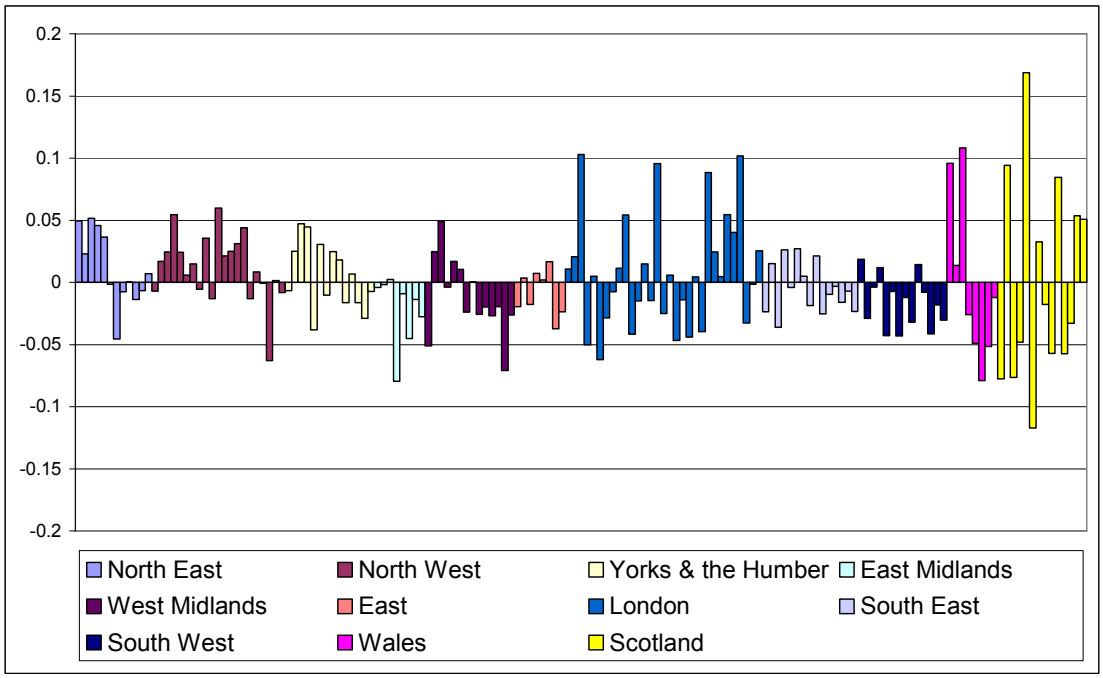


Chart A3: Residual frequency plot

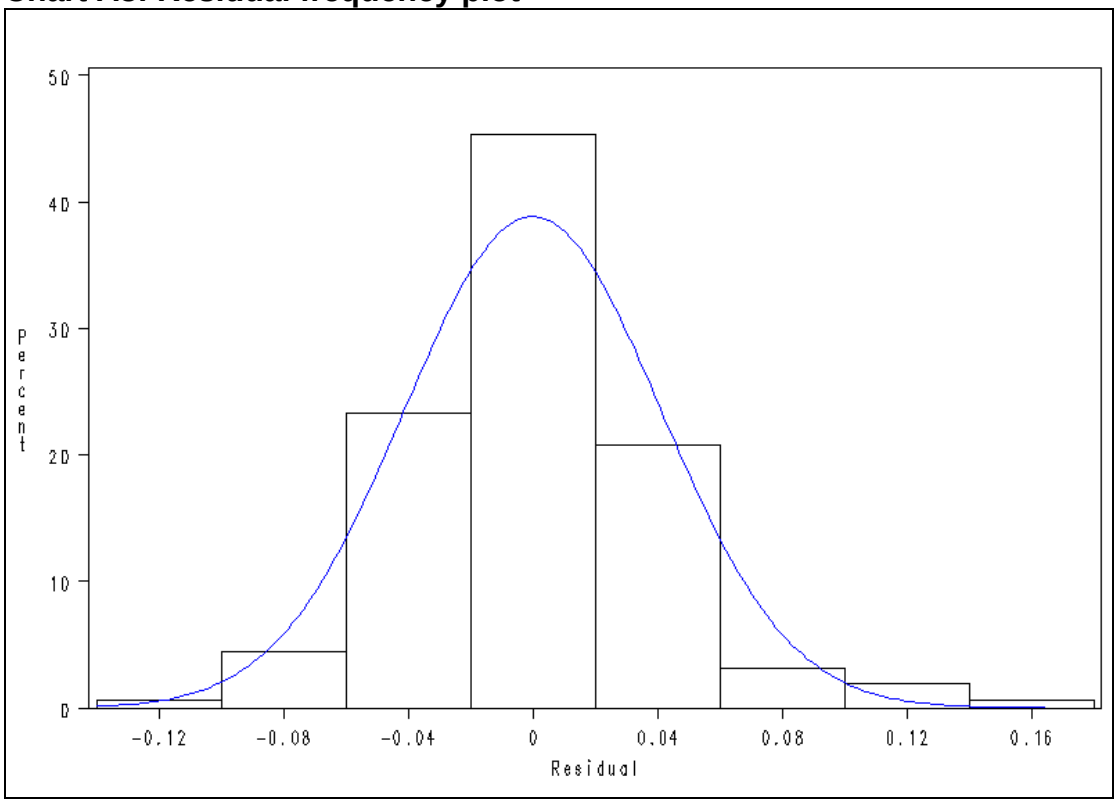
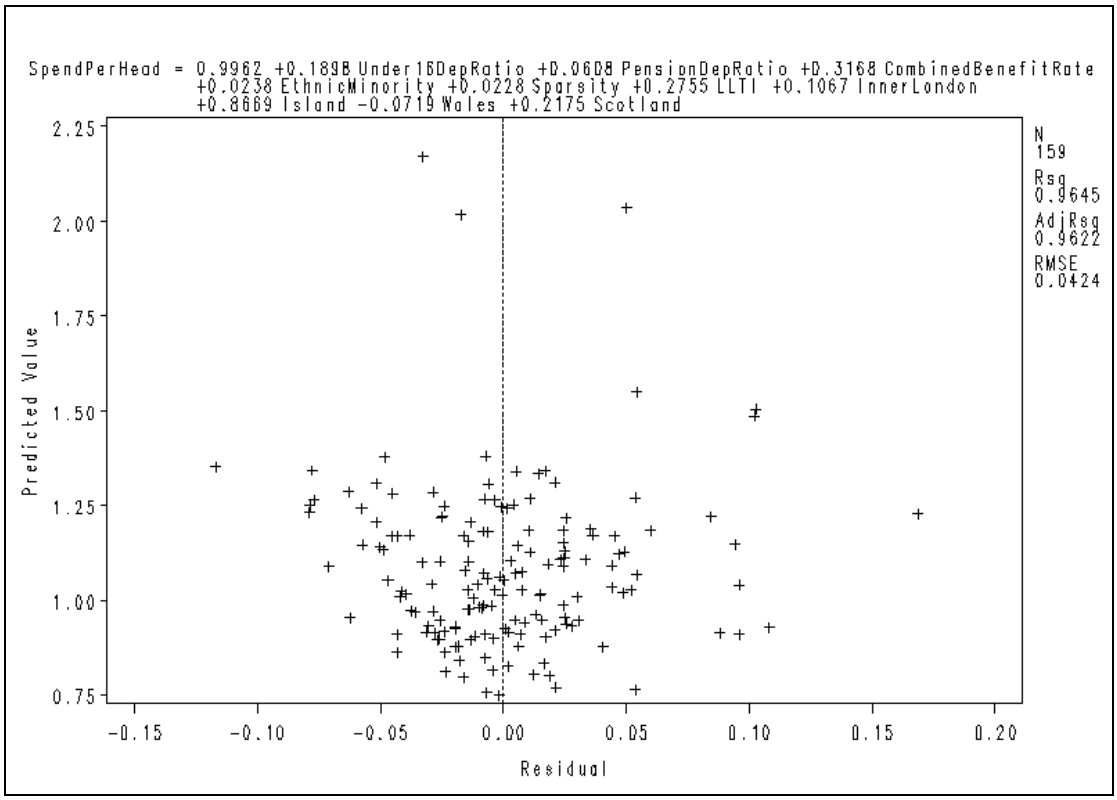


Chart A4: Predicted values and residuals



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Y Comisiwn Annibynnol ar Ariannu a Chyllid i Gymru
Ystafell 2-017
Adeiladau'r Goron
Parc Cathays
Caerdydd CF10 3NQ
Ebost: Comisiwn.Holtham@cymru.gsi.gov.uk
Gwefan: www.adolygiadariannucymru.org

Independent Commission on Funding and Finance for Wales
Room 2-017
Crown Buildings
Cathays Park
Cardiff CF10 3NQ
Email: Holtham.Commission@wales.gsi.gov.uk
Website: www.walesfundingreview.org