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The Barnett Allocation Mechanism: Formula plus Influence?

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1. INTRODUCTION

The Barnett formula, the mechanism by which the bulk of public funds are passed from the UK central government at Westminster to the now-devolved administrations in Belfast, Cardiff and Edinburgh, has been in operation for over twenty-five years.¹ It was introduced at a time of uncertainty about the constitutional future of the UK, with devolution to Scotland and Wales part of the then government's legislative agenda. When the plans for devolution fell, the formula was implemented, being first used in 1978. Heald (1994) speculates that it was adopted as an interim arrangement until a more developed allocation method could be introduced. But it was used by the subsequent Conservative government, survived the transition to devolution and remains in use to this day.

Despite being used by both Conservative and Labour governments, the formula has been the subject of vigorous debate for much of its history. The level of dispute might seem surprising, given that the formula is merely an accounting procedure and, superficially at least, a rather simple one. There is now general agreement that the strict operation of the Barnett formula should produce a convergence in public expenditure per head in the now devolved administrations towards the relative to the English value (Ferguson et al (2003), Bell (2000), Cuthbert (1998), Kay (1998)).² However, whilst transparency would normally be a key element of a formulaic approach, the operation of Barnett is opaque and difficult to monitor. In particular, there is no clear evidence that relative public expenditure convergence has actually occurred, nor that politicians desire such convergence. This is perplexing (Heald (1994), Midwinter (1999)). In this paper we present an alternative "formula plus influence" account of the allocation of funds to the now devolved administrations that is both credible and consistent with the available evidence. However, this rather subtle system might be destabilised by devolution.

In Section 2, we outline the history and mechanics of the Barnett formula. We detail how the rigorous operation of the formula should lead to relative public expenditure convergence. Section 3 describes three key puzzles of the Barnett formula: the lack of

evidence of relative public spending convergence; the contrast between the formula's mathematical conclusion and comments from government insiders as to its expected outcome; and the lack of transparency in the operation of the formula. Section 4 discusses alternative accounts: Heald's notion of formula 'by-pass' and Midwinter's arguments around bargaining, but asks why, if outcomes in spending allocations deviate systematically from the formula, the formula is used at all. Section 5 presents our alternative analysis of the problem and shows how it can best be explained as a formula *plus* influence system. Section 6 discusses whether devolution has led to changes in this procedure and how it may yet force change and Section 7 is a short conclusion.

2. THE HISTORY AND MECHANICS OF THE BARNETT FORMULA

The Barnett formula has a predecessor in the Goschen formula. Named after the Chancellor of the Exchequer in the year it was introduced (1888) it was used until 1959 (Heald and McLeod, 2002). It operated by allocating funds on the basis of 80% to England and Wales, 11% to Scotland and 9% to Ireland (until Ireland became independent). After 1918 Scotland received 11/80ths of increments over the level paid in 1913-14 (McPherson and Raab, 1988). The same level of confusion appears to have surrounded the origins and operation of the Goschen formula as initially surrounded the Barnett formula. It was not until research by Mitchell (1991) that it was shown that the Goschen formula was not based on population shares at the time of introduction but instead on the contribution of probate duties to the Exchequer. Northern Ireland operated somewhat differently. It was supposed to make an imperial contribution to Westminster as payment for those services provided by the UK government to the benefit of Northern Ireland. In fact this became an imperial subsidy, as the Stormont government was never in a position to afford such a contribution and the flow of funds was reversed. (Mitchell, 2004)

Between 1959 and 1978 there was no formally acknowledged mechanism to allocate resources to the territories. However, it arguably would be difficult to cast aside immediately the Goschen formula and employ the same form of bargaining as used by other departments without an idea of what a formula based outcome would have been.

Heald and McLeod (2002, p. 458) note that this was likely to be the case, “in that 11/80ths of England and Wales provision may have been seen as a minimum.”

This system remained in place until the introduction of the Barnett formula in 1978, but even then the formula was a second choice allocation mechanism following the failure to establish devolved assemblies for Scotland and Wales.³ The proposed method was to employ a formula system, but to base that system on a needs assessment for those functions that were to be devolved to Scotland and Wales. More importantly, the needs-based formula was to be settled after consultation with the Assemblies.

This procedure differs from the Barnett formula, which appears to have been devised by the Treasury and delivered to the territories. Since the formula was only considered to be an interim arrangement, this might not have met with much resistance from the Scottish and Welsh Offices. But the failure of devolution and the election of the strongly anti-devolutionist Conservative government meant that the Barnett formula was retained and rapidly became institutionalised, though little publicised.

The Barnett formula has changed in the extent of its application over the period of its use, but not in its broad method. It has only ever acted on increases in various forms of comparable expenditure between England and the devolved territories. This means that, in the absence of population change, any initial differences in public spending allocations per head, the appropriate measure of comparison, were perpetuated by the formula. On introduction the formula delivered 10/85ths of increases in comparable spending conducted in England to Scotland through what was then known as the Scottish block.⁴ The ratio of 10/85 reflected the population ratios between Scotland and England at the time of the formula’s establishment. Scotland’s population has fallen since the 1970s, and this was reflected by an updating of the population ratios in 1992. Since 1997, this updating has become an annual event. The latest population estimates give Scotland 10.32% of the English population, having fallen from 10.66% in the first update in 1992.

In the early years of the formula, very little was known about its operation, with most information coming through academic research rather than government publications. That changed with the publication of a Written Answer to a parliamentary question in 1997 where the process employed by the formula was set out (Official Report, 1997). Further adjustments to the formula were made due to the changes in public accounting introduced by the Labour government. The formula now acts on most of that part of the budget termed Departmental Expenditure Limits (DEL). This section of the budget is set on a three-year cycle as part of the Spending Review process, with items deemed to be predictable and therefore able to be planned for. The other part of the new budget process, Annually Managed Expenditure (AME), is outwith the formula. Its components, as the name suggests, are determined annually, largely because they are demand led. Those parts of DEL on which the formula operates are given a comparability percentage from 0% to 100%, which represents the extent to which the expenditure for that item is conducted by the devolved administration or by Westminster. This is then multiplied by the population percentage to arrive at an increment for each budget line; the sum of all budget lines being the Barnett-formula-determined increment to the devolved territory.

The logical conclusion of such a system is that relative public spending per head will converge on the English spending level, since the spending increment per head is the same and the effect of the different initial starting levels becomes proportionately less relevant with time. There are, of course, restraints on this convergence. It depends firstly on the extent of spending increases covered by the formula. This has risen over time and has also increased with devolution, so that now over 80% of the Scottish Executive's budget has increments determined by the formula. Secondly, the rate of real public spending increase in England is important: the greater the rate of increase the faster will be the rate of convergence. Thirdly, a high rate of inflation will lead to faster convergence than a lower rate, as it will drive faster nominal spending increases and the formula operates on nominal payments.⁵ Lastly, population ratios have to be correct. This is especially important for Scotland where population is falling, as an outdated population ratio would lead to Scotland receiving an increment above its population share.

It is still possible, even with population ratios correct, that convergence does not occur. Of the three territories this is only possible at present in Scotland since it requires population to be falling. In this case, while the increment may be in line with the population share, in order to calculate the per capita figure, the existing budget is divided by an ever-smaller population figure. This means that while the increment is tending towards convergence, the existing budget will slow the convergence process and might even lead to a rise in per capita spending.

There is a strong presupposition that the Barnett formula *should* in practice lead to convergence in per capita spending if it is applied correctly to large parts of the budget increment. That much is generally agreed (Bell (2000), Heald (1994), Kay (1998), Cuthbert (1998)).⁶ However, there is a suspicion that a lack of evidence of convergence is caused by spending allocations being made outwith the formula, in what is termed formula by-pass (Bell (2000), Heald and McLeod (2002)). Evidence of this is presented in the next section of the paper.

3. THE BARNETT FORMULA IN PRACTICE: A RIDDLE WRAPPED IN A MYSTERY INSIDE AN ENIGMA

There are three primary puzzles surrounding the actual operation of the Barnett formula. First, as argued in the previous section, whilst the application of the formula should lead to convergence in per capita public spending, there is little evidence of this, even though the process has nominally been in place for over a quarter of a century. Second, key government insiders maintain opinions on the operation of Barnett that are inconsistent with the logical implications of the formula. That is to say, they deny that it is the policy of the government to bring about convergence or that the operation of the formula leads to convergence. Third, the working of the formula lacks transparency: initially its operation was obscure, but even now that this is clearer, central government still fail to provide those data that would be required to externally monitor its operation. This is odd since many of the benefits from a formula-based system require transparency. We look at each of these puzzles in turn.

3.1 *The Riddle: Spending Convergence*

So far we have described only the origins of the formula, its characteristics and its theoretical outcome. There is good reason for this: evidence of the actions of the formula is scant. Public spending data on a regional basis are limited, though improving, and are most easily accessed in the annual Public Expenditure Statistical Analyses (HM Treasury). However, these data are for identifiable expenditure, and while spending is identified by government level it is based on output expenditure rather than any input allocation. Details derived from the Scottish and Welsh budget documents show additions to AME and DEL, but not what proportion of the DEL increase was determined by the formula. Equally, the biennial Statement of Funding Policy (HM Treasury) gives details of the comparability percentages, population relativities and total spending allocations to each spending line, but not the increments for any one year. While information on public spending has increased greatly it is still not enough to know whether or not convergence has taken place.

In this section we briefly review existing work looking for regional spending convergence. We also provide additional data from a slightly different perspective. Previous studies (Bailey and Fingland (2004), Midwinter (2002)) have used identifiable expenditure per head over time. They demonstrate a lack of convergence towards the English per capita spending allocation, with Bailey and Fingland finding spending levels per head in Northern Ireland and Wales converging to the Scottish level. Heald and McLeod (2002) note that this is potentially mischievous, since identifiable expenditure includes expenditure by all levels of government and not just that undertaken as a consequence of Barnett formula funding. Removing social security expenditure, the largest UK government expenditure in Scotland and Wales, alters spending patterns but still does not indicate that a squeeze in spending per head is any more likely to have occurred.

We approach this issue in a slightly different way, using information based on budget inputs, rather than the spending outputs previously employed. Specifically, we calculate

the Scottish budget allocation per head as a percentage of the corresponding UK figure for the period 1982 to 2005. These figures are not perfect for this task, not only because they are aggregate data and there are minor changes in their composition from time to time, but also because the measurement criteria altered during the period under examination. Whilst Heald and McLeod's (2002) comments remain valid, if there has been convergence in spending per head, then over the period since introduction to date *something* should be apparent. And with no official information on Barnett consequential spending available, this at least offers a perspective using different data. Given the findings of previous studies using expenditure data, if input data also show no sign of convergence, we feel it is reasonable to conclude that systematic forces are at work which, up to now at least, have thwarted convergence.

The data for early years come from the annual Autumn Statement (HM Treasury, various) and subsequently the Financial Statement and Budget Report (HM Treasury, various) after the publications were merged in 1992. Data for each year are the latest available, on the basis that these have the lowest discrepancy from actual budgets. The measures employed are the planning total for Scotland and the overall planning total for the UK. After the public sector's accounting system altered in 1998, the figures are for Scottish DEL and total UK DEL. This switch leads to a step change in the calculated outcome, but since budget per head - and importantly *changes* in relative budget per head - are examined, this change is less important.

Figure 1 shows the relative budget allocations per head over the twenty-three year period up to 2005. A few caveats about this comparison must be borne in mind. Ideally the comparison would be with English budget allocation per head, but this is not possible due to lack of English data. Using the UK budget per head means incorporating both the numerator and the budget for Wales and Northern Ireland in the denominator. These inclusions, though unfortunate, should not qualitatively alter the outcome, since English per capita expenditure plays a dominant role in the determination of UK per capita expenditure due to its high population weight. All-UK expenditures, such as defence, will

also be included, but providing its spending allocation does not change at rates substantially dissimilar to other spending lines, the impact will be minimal.

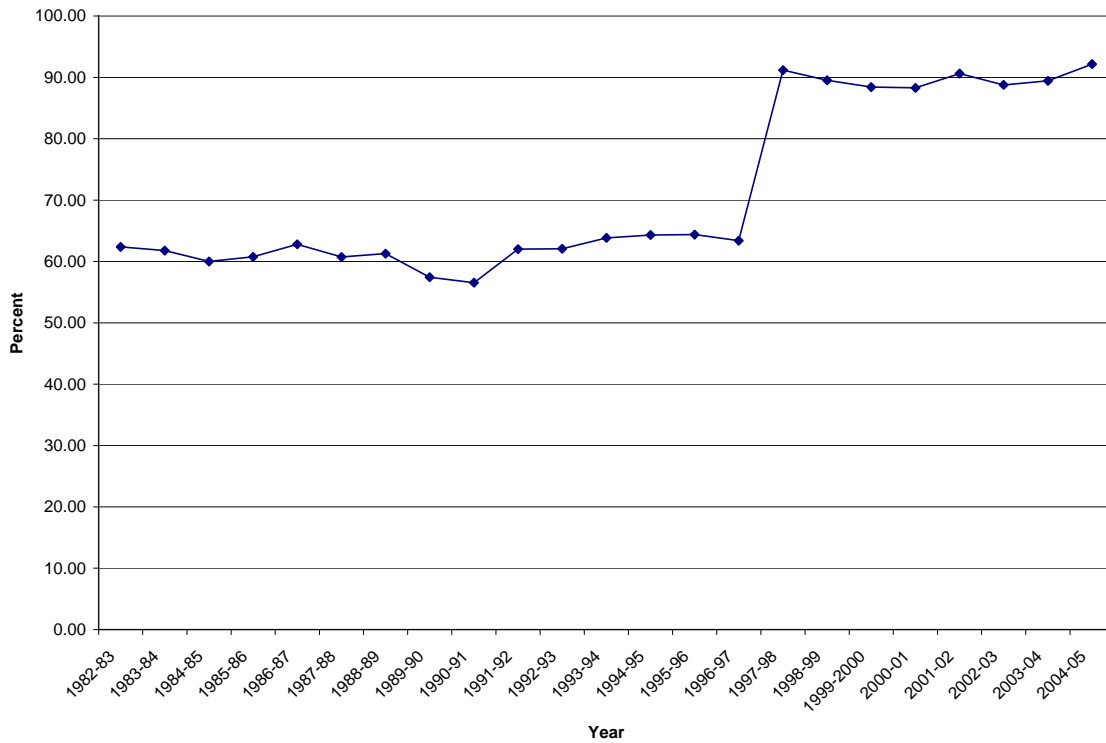


Figure 1: Scottish Spending per head as a percentage of UK Spending per head

Other than the clear change caused by the movement from planning total to DEL there is little remarkable about the relationship between Scottish and UK per capita budget allocations, other than its stability. Throughout this period the Scottish population has fallen as a percentage of the UK population, from 9.2% in 1982 to 8.5% in 2004. From 1978 until 1992 Scotland's population within the Barnett formula was fixed and as a result of this discrepancy Scotland would have received more funds through the formula than it warranted as a result. The formula was re-based in 1992 and subsequently annually updated from 1997.

There is little evidence from Figure 1 that per capita budget allocation in Scotland fell relative to the UK due to the effect of the formula, nor that changing population shares led to step changes. It would be surprising to find evidence of the latter, since the formula applies only to budget changes and these are small in the context of the whole budget.

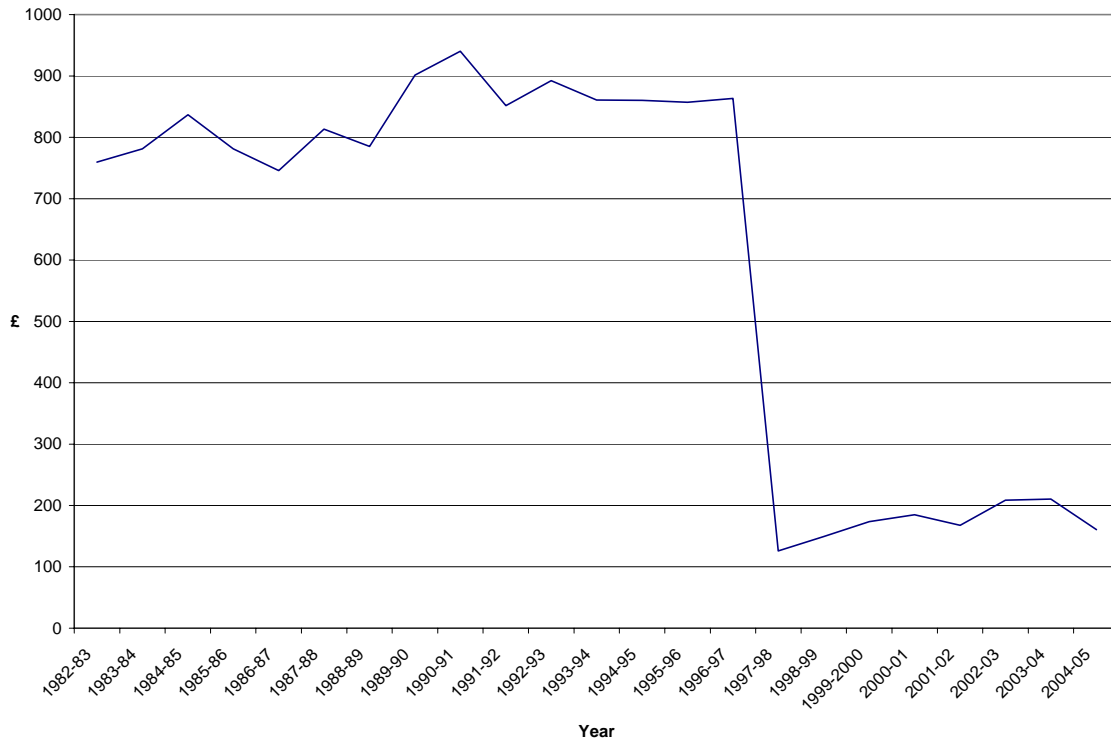


Figure 2: Difference between Scottish and UK per capita real budget allocations (1982 prices)

Figure 2 shows the difference between the Scotland and UK per capita real budget allocations (1982 prices). There does appear to be an upward trend in the difference, both using the planning total per head and DEL per head, but the effect is slight and is not consistent year on year. Real budget allocation per head is increasing in both the UK and Scotland, but Scottish budget allocation is becoming no less significant as a percentage of UK budget allocation per head. Our findings support those from other studies using different data (Cuthbert and Cuthbert (2001), Bailey and Finland (2002)), that fail to detect any convergence in relative per capita expenditure over the period in which the Barnett formula was in operation.

3.2 The Mystery: 'Insider' Perceptions on the Operation of the Formula

The second major puzzle is that insiders' claims about the outcome of the Barnett formula contradict the logical implications of its strict operation. More specifically,

insiders maintain that it is not a function of the operation of the formula to bring about regional spending convergence. However, it has been clearly demonstrated that, except under exceptional circumstances, this is the mathematical characteristic of the formula with increasing public expenditure.

Donald Dewar gives the standard insider response, and one which has been offered by both Labour and Conservative government ministers since Barnett's introduction, that

successive Governments have defended [the formula] for many years because it is simple and explicable. No, I must not exaggerate for those who understand it, it is a neat and tidy method of adjusting Scottish expenditure so that it is in line with that of comparable Departments south of the border. I expect that to continue. (Official Report - Scottish Grand Committee, 21st July 1998)

This defends the idea that the formula works as the Statement of Funding Policy describes, since a 'neat and tidy method' is doubtless a computational one. But if the formula operates in a mechanical way it will produce relative per capita public expenditure convergence.

However, this is clearly at odds with comments made by Ros Dunn, Head of HM Treasury Devolved Countries and Regions team, to the House of Lords Select Committee on the Constitution (Official Report 2002 Q1263). She maintained that 'it is important to note that ... convergence is not a property of the formula as it stands'. Given that the formula, as it stands in official published sources, would lead to exactly that outcome, providing the formula is applied to all spending increments, this is an odd comment to make. If the formula does not produce convergence, then the formula clearly does not stand as government publications would have the reader believe, and if the outcome is not formula based, how is the budget determined?

Dunn's comments also acknowledged a change, if a subtle one, in the Treasury's attitude to spending policy. The 1979 Needs Assessment (HM Treasury, 1979 p4) was underpinned by an acceptance that, 'all area of the United Kingdom are entitled to broadly the same level of public services and that the expenditure on them should be

allocated according to their relative need.’ The Barnett formula has used population as the sole proxy for need, since no other variables are involved in the calculation other than the comparability of various budget lines. This policy appears to have changed, or at least weakened, as there is now an acceptance that,

part of the point about devolution was to allow for the devolved countries to have policy evolving in different ways to meet their own circumstances, so when you come to think about what would be a uniform level, the answer is do you say that the policy approach in England is the one we should standardise on, or the policy approach in Scotland, and so on. So I think there are some very complicated issues underlying that, and the argument I think would be that what we have is a reasonable distribution method that has commanded acceptance. (House of Lords Select Committee on the Constitution, Wednesday 26th June, 2002)

The admissions that convergence is not a desired property of the formula in practice and that it is increasingly difficult to determine the resources required for a broadly similar level of service provision, suggest that a more nuanced allocation process is at work. Some outside government also hold this view. Professor Arthur Midwinter commented that,

convergence on spending was "not a policy objective" of the UK Government, and that any of the devolved administrations - Scotland, Wales and Northern Ireland - could reopen the formula if they believed it was not providing resources relative to its need. *The Scotsman* (24th June, 2005)

The comments by Dunn show that the current outcome is acceptable and this clearly justifies the process. As such there would seem to be no obvious plans to replace the current system. Midwinter’s comments support this, since he claims there is no evidence to support per capita spending convergence, and that actual spending allocations, rather than calculated mathematical outcomes, should be seen as the formula’s output.

3.3 The Enigma: Lack of Transparency

From a purely economic perspective, the mechanics of the formula have potentially beneficial efficiency outcomes. First, having a formula that is ostensibly free of political

manipulation reduces influence costs. In fact, if the formula were complete, and if transfers outwith the Barnett formula were to consist only of AME (demand-led) spending, these costs would be zero. Second, the formula also provides economic stability, since budget growth is incremental rather than zero-based. If budgets were re-based every year, stability would be greatly reduced and influence costs increased since, in its current form, the spending whims of English departments would determine entirely the outcomes for the devolved territories. Instead, the budgets of the devolved territories are based almost entirely on historical budget priorities of the Whitehall departments and only marginally on current priorities. Third, the Barnett system imposes a hard budget constraint. A strict formula-based approach means that the devolved administrations are not bailed out when they make policy mistakes. This sharpening of financial accountability is thought to improve decision taking (Hallwood and McDonald, 2004).

But these advantages require transparency of operation: at present this is missing.⁷ In the early years of its operation, the formula was obscure and little understood. More recently how the formula is technically constructed has become common, if occasionally misunderstood, knowledge. But how actual spending increases in England lead to the subsequent increases in the sums available to Scotland, Wales and Northern Ireland remains unclear. The detailed procedure cannot be verified independently and the relationship between published process and the budget outcomes is shrouded from scrutiny. Why does HM Treasury not release the figures that would verify that system works as formally stated and therefore reinforce these efficiency effects?

4. BARGAINING NOT BARNETT

Whilst the Statement of Funding Policy maintains that the Barnett process is purely formula-driven, evidence suggests that it is not. The prime advantages of having a formula-based allocation mechanism derive from the openness and transparency of the procedure. However, the operation of Barnett was originally obscure and, despite its longevity, remains opaque. Further, the primary logical feature of the formula, that is that

it will lead to a relative convergence in per capita public expenditure, both cannot be detected and is denied by key insiders.

In order to resolve these puzzles we therefore look for another account of the method of determining the financial allocation to the devolved Parliament and Assemblies, an account which is consistent with these facts. We are not alone in suggesting that there has not been convergence in expenditure per head, and two alternative processes have been outlined as to why. The second, proposed by Midwinter (2002) may be considered an extension of the first, proposed by Heald (1994). We now look briefly at both before examining Alesina and Spolaore's (2005) theory on transfers to peripheral regions.

Heald (1994) suggests that failure of spending per head to converge is a result of making extra payments outwith the formula system: that is, a formula plus system. These 'formula by-pass' payments may vary from year to year, be large or small, be systematic or ad hoc, but they would act to erode the convergence features of the formula. He gives examples of how expenditure allocation outwith the formula might be justified. For instance, where a national pay deal is agreed, and Scotland has a greater than population share of that public sector group, it would be relatively under-funded. A similar financial difficulty would occur where one service is undertaken by the public sector in Scotland but not in England, Scottish Water for instance.

Midwinter (2002, p108) takes this argument further in asserting that 'Scotland's share of UK public expenditure reflects a whole range of decisions, not just the mechanical application of the formula.' He extends Heald's argument that there are formula by-passes to one that places limited emphasis on the formula and rather more on bargaining: that is to say, his position seems to be bargaining plus formula rather than formula plus bargaining. He agrees that under certain circumstances expenditure per head could converge, though he does not believe it is appropriate to call such convergence a 'squeeze', as it is often referred to. Midwinter's position is clearly consistent with that of Dunn (Official Report, 2002) cited in the previous section. Midwinter does not regard the use of the formula as a way of imposing relative public spending convergence. Further,

he believes there is no evidence from spending data to justify consistent convergence between Scottish and English per capita spending, but that instead spending has fluctuated around 125% of the UK expenditure per head total since 1992. Our data analysis is broadly in line with his findings.

The views of Heald and Midwinter are given theoretical support by Alesina and Spolaore (2005). These authors argue that peripherality increases both the geographical and cultural distance from the provision of public goods. With a single national tax structure, the benefits from a unified country are distributed in a regionally differentiated way, with some territories having a possible incentive to secede. However, the existing borders of the UK may maximise total welfare, in that there are generally economies of scale and scope in the centralised provision of public goods. While secession may improve welfare in one the seceding region, it will have a detrimental impact on total welfare.

Alesina and Spolaore (2005) suggest two solutions to this problem. Providing transfers do not lead to significant distortions, it may be optimal to make payments from better-provided areas to poorer-provided areas. Alternatively, public good provision may be decentralised. There is tangible evidence to both these proposals from the UK. The creation of the post of Minister of State, then Secretary of State for Scotland and finally the Scottish Parliament to Scotland, and the provision of devolved rule in Northern Ireland, until it was suspended in 1972 and then its occasional reestablishment since 1998, represent a decentralising of public good provision. The much later creation of the Welsh Office in 1964 and the highly marginal 1999 pro-devolution vote in Wales may serve to indicate both its closer geographical and social proximity to the 'centre'.

In addition, Northern Ireland, Scotland and Wales have higher per capita identifiable expenditure than England. The HM Treasury Needs Assessment (HM Treasury, 1979) showed needs indices for a similar level of provision for the public services that were to be devolved under the 1976 plans. These plans gave increasing spending per head respectively to Wales, Scotland and Northern Ireland, figures all above the spending level per head in England. These figures remain higher today, as shown in Section 3.1, even

though the Barnett formula should encourage convergence. Both of Alesina and Spolaore's projected outcomes can thus be seen in the case of the UK.

The Alesina and Spolaore argument is based on efficiency criteria, though this might well be compatible with a "territorial justice" approach, especially if, as Binmore (1994) argues, our notions of justice and fairness in fact realistically reflect the bargaining position of individuals and groups. Applying the general argument in Binmore (1994) to this particular case, the additional public sector provision in the devolved territories can be justified in terms of the territories' physical and cultural peripherality. However, many disadvantaged groups do not get such favourable treatment. In this case the argument is reinforced by the possibility of secession and the implied bargaining power this generates. Such an argument would suggest a mechanism rather more systematic than that identified by Heald, perhaps closer to the position adopted by Midwinter.

But if we accept this bargaining approach, another puzzle appears. Why have the formula at all? In bargaining theory, the outcome can be affected by varying the fall back position or the bargaining strength of either player. With a bargaining plus formula approach, the most straightforward interpretation might be that the formula determines the fall back position for each player – a situation to which each player reverts if they fail to reach an agreement. But given that this is a zero-sum game, the players would always be forced back to the formula outcome. With any other bargain, at least one player would be worse off than their formula fall back. But it is exactly this result that we are attempting to avoid by introducing bargaining.

Of course, the formula might simply be cosmetic, veiling the real processes at work. A cynical view is that the formula is a piece of misdirection for those in the English regions, a deception pointing to a relative expenditure convergence that is not in fact happening. But if this is the motivation, why was the mathematical operation of the formula initially hidden? Also, why go to elaborate fine-tuning of the formula, such as occurred in 1992 and 1997, if the real motivation is spin? Further, in practice, if this is a central government dodge - perpetrated by both Labour and Conservative governments - it is one

that operates very imperfectly. For the Barnett process receives much criticism in the now devolved regions over something that has apparently not happened - convergence in spending per head.⁸ Clearly, a straight bargaining account will accommodate the Barnett puzzles, but raises problems of its own.

5. THE FORMULA PLUS INFLUENCE SYSTEM

We wish to suggest a procedure that starts from the Barnett formula, but formally incorporates influence behaviour (Becker, 1983, 1985). We call this a formula plus influence system. We first outline our position in broad-brush terms and then discuss the details. In our approach, as far as the now devolved administrations are concerned, the Barnett formula generates a floor allocation of funds. The now devolved administrations in addition use resources in an attempt to augment the allocation through influence behaviour. Whilst the Barnett formula operating alone produces convergence in per capita public expenditure, the impact of the influence behaviour is to generate additional revenues that are then incorporated into the base for Barnett calculations in subsequent years. The central government can determine the overall allocation of funds to the now devolved administrations through varying its responsiveness to this influence behaviour. Therefore central government can maintain a desired relative per capita public expenditure ratio that mimics what would be expected from the two sides' bargaining positions, as in Alesina and Spolaore (2005). Appendix 1 gives a mathematical demonstration of this result.

5.1 Consistency with the Evidence

A key strength of the formula plus influence version of the operation of Barnett is that it more satisfactorily accommodates the existing evidence than do alternative accounts. We begin with the evidence that is inconsistent with the strict application of the Barnett formula. First, within the formula plus influence system, the lack of empirical support of convergence is straightforward. The formal inclusion of influence activity means that the budget outcomes for the devolved administrations would always be greater than a strict

application of Barnett. Second, there is no inconsistency in the views of insiders that the operation of the Barnett formula is not meant to generate convergence. As we show in Appendix 1, by appropriately calibrating its reaction to influence behaviour, central government can maintain the relative per capita public expenditures and the available evidence suggests this is what has occurred, at least in the case of Scotland. Third, where the system works with a combination of formula and influence, the benefits of external transparency are questionable. Rather, the overall effectiveness of the system depends on a degree of opacity. In particular, it might be difficult for the central government to acknowledge that the allocation process is systematically open to influence behaviour from the presently devolved authorities. Further, it might be inconvenient that there are explicit or implicit target relative per capita public expenditure differentials that the central government is choosing to maintain.

We now turn to the evidence presented against the pure bargaining solution. First, in the formula plus influence version of the budget allocation process, the formula still plays an important role. By focusing attention on marginal changes, it reduces overall influence costs and by setting a floor to the actual budget it gives a high degree of stability to the finances of the devolved administrations. This means that the details of the formula are important and we would expect revision from time to time. Second, the fact that the Barnett formula acting alone would produce convergence is crucial for the formula plus influence account of the budgetary process. For example, if the formula by itself maintained the relative per capita public expenditures, then any additional influence behaviour would increase these relativities. Because the influence behaviour only works in one direction it is important that the rule-based outcome undershoots any desired target. Such undershooting in this case means that the use of the formula alone implies convergence.

5.2 Strengths of the Formula Plus Influence System

It is important that the formula plus influence system is consistent with the evidence that other accounts of the allocation of funds to the devolved administrations find difficult to

handle. But this is not enough. We must also be able to make a coherent case for the desirability of such a system. There are three potential advantages from a formula plus influence plus influence system: improved flexibility, greater political integration and increased information flows.

In incorporating influence, the flexibility of the allocation system is improved. A formula system operates as a rule of thumb that by definition cannot adapt to unforeseen circumstances. Even if the formula has broad agreement initially, it will lose support if it is perceived to become unfair over time. But the economy is likely to be subject to spatially idiosyncratic short-term and long-term shocks, such as the onset of Foot and Mouth disease or the impact of differential population growth, which strain the formula. A strictly applied rules-based system trades off flexibility for increased certainty and reduced influence costs. However, the inflexibility of a completely rules-based system is likely to become more costly over time and might ultimately threaten the viability of the allocation system. Similar problems are discussed at length in the literature on rules-based regimes for monetary policy (Drazen, 2002).

Allowing influence behaviour to affect outcomes in a controlled way is likely to improve the integration of these peripheral regions into the national political system. The regional administrations can be seen to be operating in the interests of the local population in attempting to increase funding for issues of local importance. Similarly the centre can be seen to be reacting in a relevant manner – with cash - to what are taken to be the most important needs of the now devolved administrations. This is of particular importance pre-devolution in bolstering the legitimacy and credibility of the locally unelected administrations, and gains significance given the limited independent tax-raising powers of the peripheral regions, either pre- or post-devolution.

Finally the influence behaviour provides important information to the central government. It gives an incentive to the now devolved administrations to signal their problems and priorities.

6. THE BARNETT PROCEDURE POST-DEVOLUTION

An important motive for attempting to identify the actual mechanism that determines the size of the budgets going to the now-devolved administrations is to improve the debate in this area. At present, the disjuncture between the Statement of Funding Policy and the apparent budget outcomes simply reinforces polarised positions. In this paper we argue that a “formula plus influence” model gives a more consistent account of the funding process. We hope that this might focus attention on matters of real, rather than rhetorical, importance.

One issue in particular concerns us. Some authors interpret the stability of the relative per capita public expenditure in Scotland as indicating that worries about the future funding of the Scottish Parliament are misplaced. However, we believe this to be an overly sanguine view. For whilst we argue here that the relatively favourable public expenditure positions of the devolved administrations stems from their peripheral status, and the potential bargaining power this gives, the particular administrative arrangements for delivering this outcome are important too.

Devolution has two relevant implications for the operation of the determination of the funding levels to the devolved Parliament and Assemblies. First, it seems inconceivable that the operation of the formula remain opaque and not subject to external verification. Devolution, and the increase in financial information that has accompanied it, has led to an increase in the visibility of the Barnett formula and greater scrutiny of the formula’s outcome and its method of operation. There is no evidence that this scrutiny will reduce as devolution becomes embedded, and in fact seems more likely to increase, even though it is now clear the formula’s mathematical outcome is unlikely. If our conjecture that Barnett operates through both formula and influence is correct, this will destabilise the procedure.

Second, devolution might have increased the notional bargaining power of the now devolved administrations through making secession organizationally more

straightforward. However, it has changed, and is likely to have reduced, the potential for influence activity in Westminster and Whitehall. The role of Secretary of State for Scotland is, at present, quixotically combined with that of Transport Secretary in the UK cabinet. With a separate First Minister in the Scottish Parliament, it seems unlikely that the UK cabinet spends much time on Scottish affairs. Further, where powers have been devolved to the Scottish Parliament, civil servants are likely to have less contact with their counterparts in the corresponding Whitehall departments. Therefore the ability to affect budgetary decision in Scotland's favour might well be reduced. Again this could destabilise what has, up until now, been a rather robust mechanism.

7. CONCLUSIONS

In this paper we suggest that a formula plus influence mechanism has determined the budget allocations to the now devolved administrations over the last quarter of a century. This procedure has delivered a remarkably stable relative per capita public expenditure in Scotland that, after Alesina and Spolaore (2005), we argue reflects its peripherality. The mechanism has other advantages for both the central and now devolved administrations. However, whilst the Barnett formula was essentially unchanged by devolution, other key aspects of this mechanism – a lack of transparency and sources of influence in Whitehall and Westminster - have altered. These developments might ultimately destabilise this otherwise secure system.

Appendix 1: A Mathematical Representation of the Formula and Influence System

In period t , the relevant ratio of Scottish to English public expenditure per head, m , is given as:

$$(1) \quad m = \frac{A_t}{G_t \sigma}$$

where A_t is the actual Scottish real allocation of funds through the Barnett mechanism, G_t is the comparable English real public expenditure figure, σ is the Scottish population measured relative to the English total and the subscript t indicates the time period. Given that we are considering a situation where Scotland has a relative advantage in the provision of public funding, $m > 1$. In this appendix we investigate the circumstances under which a combination of the Barnett formula plus influence behaviour, regulated by the central government, maintains the value of m constant over time.

A Scottish administration can use real resources in period t , I_t , to influence the budget allocation from central government by a real amount, E_{t+1} , in the subsequent year. The impact of this influence activity is governed by the general relationship:

$$(2) \quad \frac{E_{t+1}}{B_{t+1}} = Z \left[\frac{I_t}{A_t} \right]^\alpha$$

where B_{t+1} is the real Barnett counterfactual allocation of resources in period $t+1$, and $Z > 0$ and $1 > \alpha > 0$ are at present treated as parameters. However, we argue later that the central government can control Z and thereby determine the level of influence behaviour. Equation (2) implies that the real value of the additional funds in the next period, as a proportion of the counter-factual Barnett allocation, is positively related to the proportion of the present period's allocation devoted to influence behaviour.

Equation (2) can be also be expressed as:

$$(3) \quad E_{t+1} = K_t [I_t]^\alpha$$

where:

$$(4) \quad K_t = Z \left[\frac{B_{t+1}}{A_t^\alpha} \right]$$

and

$$\frac{dE_{t+1}}{dI_t} > 0, \frac{d^2E_{t+1}}{dI_t^2} < 0$$

Further, the benefits to the Scottish administration do not stop in period 1: any improvement in funding in one period is continued in nominal terms into all subsequent periods, as it becomes built into the Barnett formula outcomes.

The forward-looking Scottish administration sets the value of I_t in order to maximise the present value, Π_t , of public sector consumption. This is given as:

$$(5) \quad \Pi_t = \sum_{i=t}^{\infty} \delta^{i-t} C_i$$

where C_i is real public consumption in period i and δ is the time discount factor. For the initial period, that is $i = t$:

$$(6) \quad C_t = A_t - I_t$$

where A_i is the real allocation in period t . When $i > t$:

$$(7) \quad C_i = A_i = B_i + \frac{E_{t+1}}{(1+\rho)^{i-t-1}}$$

where B_i is the counter-factual Barnett allocation for period i and ρ is the rate of inflation. By counterfactual Barnett allocation we mean the allocation that would follow from A_t without influence activity. The additional funding generated by the influence behaviour in period t is discounted by the inflation rate because the Barnett formula operates in nominal terms.

Combining equations (3), (4), (5), (6) and (7) gives:

$$(8) \quad \Pi_t = A_t - I_t + \sum_{i=t+1}^{\infty} \delta^{i-t} B_i + K_t I_t^\alpha \sum_{j=t+1}^{\infty} \frac{\delta^{j-t}}{(1+\rho)^{j-t-1}} = A_t - I_t + \sum_{i=t+1}^{\infty} \delta^{i-t} B_i + K_t I_t^\alpha \left[\frac{\delta(1+\rho)}{1+\rho-\delta} \right]$$

Partially differentiating equation (8) with respect to I_t and setting this to zero gives the investment in influence that maximises present value of real Scottish public consumption:

$$(9) \quad \frac{\partial \Pi}{\partial I_t} = \left[\frac{K_t \alpha}{I_t^{1-\alpha}} \right] \left[\frac{\delta(1+\rho)}{1+\rho-\delta} \right] - 1 = 0$$

Rearranging equation (9) produces:

$$(10) \quad I_t = \left[\frac{K_t \alpha \delta (1+\rho)}{1+\rho-\delta} \right]^{\frac{1}{1-\alpha}}$$

Substituting equation (10) into equation (3) gives the real increase in central government funds received in period $t+1$ as a result of optimal influence activity by the Scottish administration:

$$(11) \quad E_{t+1} = K_t^{\frac{1}{1-\alpha}} \left[\frac{\alpha\delta(1+\rho)}{1+\rho-\delta} \right]^{\frac{\alpha}{1-\alpha}} = Z \left[\frac{B_{t+1}}{A_t^\alpha} \right]^{\frac{1}{1-\alpha}} \left[\frac{\alpha\delta(1+\rho)}{1+\rho-\delta} \right]^{\frac{\alpha}{1-\alpha}}$$

The most straightforward way to think about the national government regulating the influence behaviour of the devolved administrations is to treat the parameter Z as a central government policy instrument. That is to say, variations in the parameter Z correspond to the central government varying the persuasiveness of the devolved administrations. The logical next step is to ask the question: can the value of this influence-behaviour efficiency parameter, Z , be set so as to maintain the Scottish relative public expenditure per head constant, as against the English figure?

The counterfactual Scottish Barnett allocation for the period $t+1$, that is the allocation without influence behaviour, is calculated in the following way. Each of the devolved territories receives their nominal budget for the previous year plus a share of the increase in the English nominal budget. This share is proportional to the devolved administration's population. If the increase in real national government expenditure is g , and the inflation rate is ρ , then the change in nominal English government expenditure, ΔG_{t+1}^N , is given as:

$$(12) \quad \Delta G_{t+1}^N = G_t(1+\rho)(1+g) - G_t = G_t(\rho + g + \rho g)$$

Using equations (1) and (12), the counterfactual Barnett allocation is therefore:

$$(13) \quad B_{t+1} = \frac{A_t + \sigma \Delta G_{t+1}^N}{1+\rho} = \frac{G_t \sigma m + G_t \sigma (\rho + g + \rho g)}{1+\rho} = \frac{G_t \sigma (m + \rho + g + \rho g)}{(1+\rho)}$$

Again, using equation (1), equation (13) can be expressed as:

$$(14) \quad B_{t+1} = \frac{A_t(m + \rho + g + \rho g)}{(1 + \rho)m}$$

The required increase in the budget generated by influence behaviour in order to maintain the real value of the Scottish allocation (and therefore its relatively favourable position in terms of per capita expenditure) is given by:

$$(15) \quad E_{t+1} + B_{t+1} = G_t \sigma m(1 + g)$$

Rearranging equation (15) and using equation (13) and (1) produces:

$$(16) \quad E_{t+1} = \frac{G_t \sigma}{1 + \rho} (m(1 + g)(1 + \rho) - m - g - \rho - \rho g) = A_t \left[\frac{(m-1)(g + \rho + \rho g)}{(1 + \rho)m} \right]$$

Equation (16) indicates the funding required, additional to that coming through the strict application of the Barnett formula, to maintain the relatively favourable Scottish per capita public expenditure. Combining equation (14) and (11) gives the equation for E_{t+1} derived from the maximising behaviour of the Scottish administration. This gives:

$$(17) \quad E_{t+1} = ZA_t \left[\frac{m + \rho + g + \rho g}{(1 + \rho)m} \right]^{\frac{1}{1-\alpha}} \left[\frac{\alpha \delta (1 + \rho)}{1 + \rho - \delta} \right]^{\frac{\alpha}{1-\alpha}}$$

If equation (16) is substituted in equation (17), we can derive the value of Z , the influence-effectiveness parameter, which will maintain the value of the relative per capita public expenditure, m , constant:

$$(18) \quad Z = \frac{(m-1)(g + \rho + \rho g)}{[m + \rho + g + \rho g]^{\frac{1}{1-\alpha}}} \left[\frac{(1 + \rho - \delta)(1 + \rho)m}{\alpha \delta (1 + \rho)} \right]^{\frac{\alpha}{1-\alpha}}$$

Whilst the expression on the RHS of equation (18) is rather complex, it is independent of the scale of the initial Barnett allocation. Therefore in period $t+1$, when the Scottish administration again has to take the decision about influence activity, it will allocate the same share of its budget with the same relative effects on the allocation in future rounds.

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NOTES

¹ The present position of Northern Ireland is slightly anomalous in that the operation of the devolved institutions is temporarily suspended.

² In the remainder of this paper we refer to this as relative public expenditure convergence.

³ Heald (1980) named the formula after Joel Barnett, Chief Secretary to the Treasury when the formula was introduced.

⁴ Initially the changes in the relevant expenditure totals were measured in real terms. This was changed to nominal terms in 1982.

⁵ Also, with population fixed, the strict application of the Barnett formula maintains the nominal absolute difference in per capita expenditure. However, inflation reduces the real value of these nominal differences.

⁶ A full mathematical treatment of the formula and squeeze can be found in Cuthbert (1998) and Bell (2000).

⁷ Up until about a decade ago the Barnett formula would be jocularly compared to the Schleswig-Holstein question, where there were thought to be only three people who had ever had understood it: one was mad, one was dead and one was David Heald.

⁸ The formula also gets criticised in some English regions for maintaining intact the original additional per capita nominal expenditure advantage that the now devolved regions had over the English average (McGregor and Swales, 2005).