

STRATHCLYDE

DISCUSSION PAPERS IN ECONOMICS

**GRANTS VERSUS TAX SHARING: THE EXTENT OF
CENTRAL GOVERNMENT CONTROL**

BY

GRAEME ROY

No. 06-05

**DEPARTMENT OF ECONOMICS
UNIVERSITY OF STRATHCLYDE
GLASGOW**

Grants versus Tax Sharing: The Extent of Central Government Control

GRAEME ROY*
[University of Strathclyde]

Abstract

Throughout the OECD, regional and local governments typically rely heavily upon transfers from their national governments to finance their day to day expenditures. While grants remain the most popular method of transferring resources from the centre to the sub-centre, the potential for greater use of tax sharing agreements has received considerable attention in recent years. A key aspect of this debate and of the fiscal decentralisation literature more generally, is the attempt to strike a balance between on the one hand, sub-central government freedom and accountability and on the other, macroeconomic stability. This paper assesses the relative ability of the centre to control national fiscal policy in an effort to re-balance the budget during periods of fiscal crisis. We compare and contrast the resources available to central governments when faced with a need to consolidate across various decentralisation regimes, demonstrating that, contrary to established thinking, grants and tax sharing imply two very different levels of central authority.

JEL Codes: H60, H70, H77

* The author would like to thank participants at the “Regional Agglomeration, Growth and Multilevel Governance” Workshop at the University of Ghent in November 2005 and seminars at the Universities of Glasgow and Strathclyde for very helpful comments on an earlier draft of this paper. The author gratefully acknowledges funding under the ESRC Postdoctoral Fellowship scheme – Award Number PTA-026-27-1059.

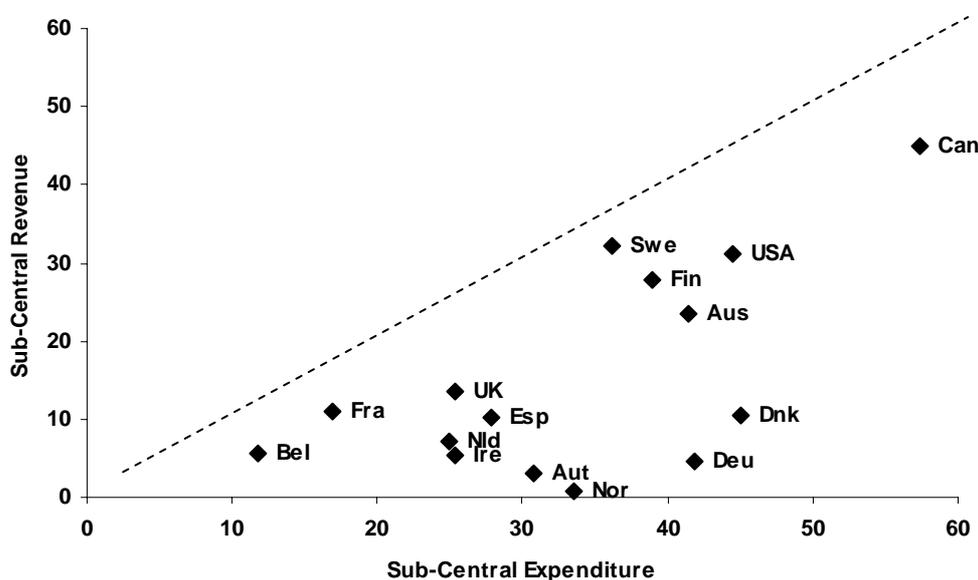
Email: graeme.d.roy@strath.ac.uk

1. Introduction

The recent trend in many countries towards greater political and fiscal decentralisation has re-ignited the debate on the appropriate level and form of financial autonomy for sub-central governments. Greater fiscal responsibilities can lead to more popular and efficient local public services but, as the recent fiscal crises' in Latin America have shown, the failure to monitor and discipline potentially profligate sub-central governments can lead to serious macroeconomic problems.

As Figure 1 highlights, sub-central expenditures universally outweigh 'own-source' revenues (i.e. revenues over which the sub-centre has full discretion). To plug this gap, two forms of central to sub-central intergovernmental transfers are used; grants and tax sharing. This 'vertical imbalance' implies that, even in countries with high levels of expenditure decentralisation, the central/federal government can retain a sizeable degree of de-facto or 'effective' control over sub-central fiscal policy. By tightening transfers the centre is able to 'force the hand' of local politicians to cut their expenditures (or to increase the limited revenues at their disposal) and vice versa.

Figure 1: Sub-Central Expenditure and Autonomous Revenue
(% of General Government totals)



Source: IMF GFS (2002), Stegarescu (2005) and own calculations.

Given the current interest in devolution, it is surprising that while much of the fiscal decentralisation/federalism literature has centred upon the normative implications of devolved expenditures and revenues (see Darby et al. (2003) for a survey), there has been

very little discussion on the practicalities of alternative decentralisation regimes (i.e. revenue autonomy, grant finance, tax sharing etc). As a result, a number of important questions remain unanswered. For example, how does the relationship between the centre and the sub-centre differ according to the financial regime in place? Is a system of tax sharing more efficient than grants? Does the level of central control over the sub-centre differ according to the type of transfer mechanism? This debate is important as in many countries, including the UK, dissatisfaction with the historical reliance upon grants to finance devolved and local governments has been growing in recent years - see for example Hallwood and MacDonald (2005 and 2006) and *The Economist* (2006). In this paper, we attempt to address some of these issues.

Grants take the form of a direct transfer of money from the centre to the sub-centre while tax sharing revenues represent shared withdrawals by both the centre and the sub-centre from a common tax base. As discussed in Rodden (2002 and 2003) and Stegarescu (2005), in reality the ability of the sub-centre to influence the revenues they receive from grants and tax sharing tend to be heavily constrained. Instead, it is the central government that controls the mechanisms to increase or decrease the amount of money allocated annually to sub-central governments¹.

Under a system of intergovernmental grants, while it is possible for sub-central governments to request additional funding support, the centre ultimately decides on the level of revenue to be transferred. In practice, with tax sharing even though the scenario is slightly different, the end result is identical. In countries with substantial tax sharing regimes, such as Germany, Austria and Belgium, the ‘shares’ of total tax revenue each tier receives are fixed either by formal legislation, constitutional amendments, means-tested formulas and/or historical allocations, while the centre retains control over both the tax base and the tax rate of the commonly shared revenue source – see Stegarescu (2005). Consequently, sub-central governments have little or no authority to alter these revenues, depending instead upon the annual decisions of the centre to maintain or alter the total tax take and the pre-determined formulas to allocate these revenues. By altering the tax rate or base, the centre is able to ‘force the hand’ of sub-central governments into expenditure cuts.

¹ In addition, central governments can often exert influence on sub-central spending patterns through directives, expenditure targets, spending guidelines and so forth. These further reduce the autonomy of sub-central governments. While important, the focus of this paper is on sub-central revenues and therefore we do not discuss such mechanisms in great detail.

It follows therefore, that in terms of the degree of central control and sub-central autonomy, tax sharing and grants appear at a first glance to be identical. Indeed, it has been argued by many in the academic literature including Pola (1999), Ebel and Yilmaz (2002) and Rodden (2003), that empirical research should treat these two types of revenue symmetrically. A similar conclusion has also been reached at the policy level. In Recommendation Rec(2005)1 from the Council of Europe's Committee of Ministers meeting, January 19th 2005 it was formally deemed that "the type of shared taxes in which central government retains the control over the tax rate and tax base; according to Recommendation Rec(2005)1, these non exclusive fiscal resources are financial transfers; if they are not in direct relation to the amounts collected locally, then *they are also considered as grants*²."

In this paper however, we demonstrate that there are important differences between grants and tax sharing which have significant implications for the centre's ability to respond to macroeconomic shocks. More specifically, we assess the policy instruments available to central governments when faced with an urgent requirement to balance the national budget. We argue that while the degree of sub-central dependence upon the centre is similar irrespective of the source of intergovernmental transfer, in most circumstances the degree of central control differs markedly between tax sharing and grants. In short, with the exception of a special case, we show that for a given level of sub-central expenditure, central governments have a greater degree of effective control over sub-central and hence national fiscal policy under grants than they do under tax sharing. This subtle distinction between sub-central dependence and central control has been largely overlooked in the literature to date. The ability of central governments to respond to macroeconomic shocks and episodes of fiscal stress would be reduced if grants were to be replaced with tax sharing.

This result has a number of important implications. Firstly, at the policy level it suggests an additional key distinction between tax sharing and grants which must be taken into account when considering how best to finance sub-central expenditures. As mentioned above, in recent years the reliance upon grants as the primary source of intergovernmental transfer mechanism has been criticised with many economists advocating greater use of tax sharing. While recognising many of the advantages of tax sharing systems, such as improved incentive mechanisms for local politicians, our result indicates that a switch to

² See EC (2005) and OECD (2006).

tax sharing would reduce the ability of the central government to stabilise the macroeconomy and/or national budget. Consequently, additional institutional frameworks may be required to guard against potential instability. Secondly, from an academic research viewpoint our analysis implies that the recent trend in the empirical literature to lump together revenues from tax sharing and grants (see for example Rodden (2002 & 2003) and Fiva (2005)) might not always be appropriate. Our analysis suggest that this approach is valid only if one's focus is upon the degree of sub-central autonomy within a country but that it is inappropriate if one's interest is in the extent of central control over sub-central fiscal policy and/or national fiscal policy management. A clear distinction between the two has to be made.

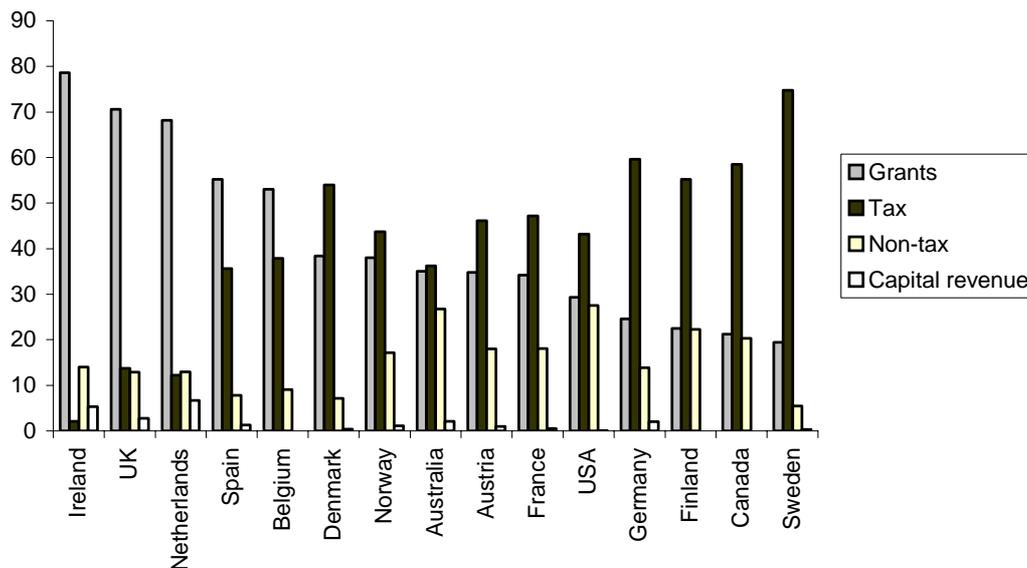
The outline of the paper is as follows. In Section 2 we briefly discuss grants and tax sharing while Section 3 conducts our formal analysis by examining the degree of 'effective' central control over national fiscal policy under various decentralisation regimes. Section 4 concludes.

2. Grants and Tax Sharing

While there are numerous 'types' of grants, all of them share the key feature of representing a direct transfer of revenues from the centre to sub-central governments. Block grants are typically aimed at addressing vertical (i.e. between tiers of government) and horizontal (i.e. between individual sub-central governments) imbalances. In contrast, matching and specific grants are used by central governments to target specific policy areas which, while not under their direct control, are deemed to be of social, economic or political importance at the national level. With block grants, sub-central governments typically have considerable discretion to allocate the money transferred. In matching and specific grants discretion is much more limited.

Historically, grants have been the most popular method of transferring resources between governments and as Figure 2 demonstrates, this remains the case in many OECD countries.

Figure 2: Composition of Sub-Central Government Revenues
(as a percentage of their Total Revenues)



Source: IMF Government Finance Statistics (2002 edition).³

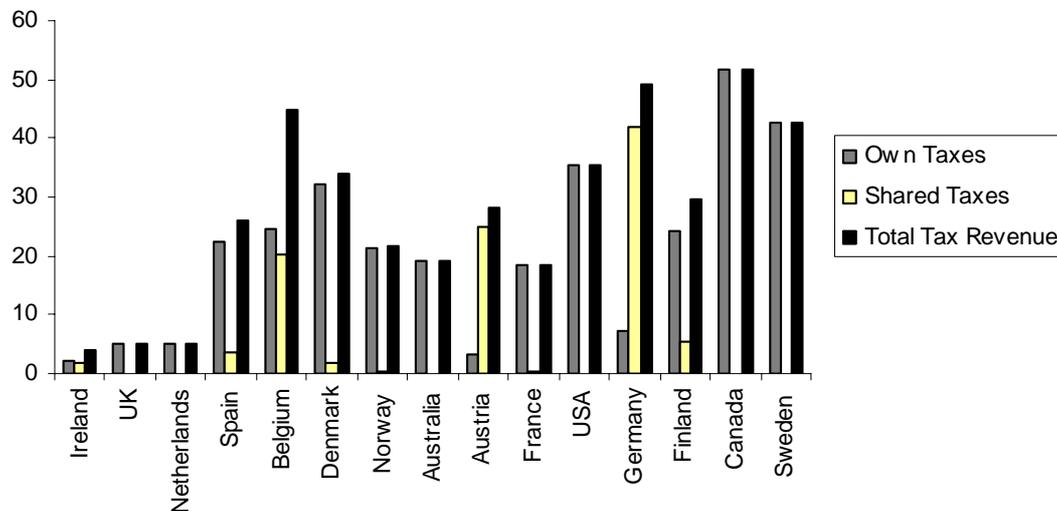
Tax sharing occurs when two or more tiers of government split the total national tax yield from a particular tax. (See Figure 3 for a summary of tax sharing and own source taxation in a selection of OECD countries.) A hypothetical example of a shared tax system would be national income tax whereby the centre receives 75% of all income tax receipts and the sub-centre 25%.

As we will demonstrate, the ability of the centre to alter the *shares of the total tax take* (i.e. the split of the tax revenue allocated to each tier; 50:50, 75:25 etc) is critical in determining the degree of effective control over sub-central fiscal policy. Stegarescu (2005) shows that in the OECD, virtually all tax sharing regimes involve legislatively ‘fixed’ tax shares. In fact, out of the 23 countries surveyed, Belgium was the only country where the central government was able to unilaterally alter the revenue-split over certain elements of taxation in the annual budget process and even then, such revenues only contribute around 0.3% to the total sub-central budget. In other countries such as Greece, Portugal and Finland, while the central government is able to alter the revenue-split, to do so requires primary legislation independent of the annual budget. Again, the total budget contributions are small. Instead, “revenue sharing flows are almost always determined by constitutional or other stable formulae” Rodden (2002), and legislation to alter these allocations often requires constitutional amendments and/or the agreement of the sub-central authorities, Stegarescu (2005).

³ In Figure 2, tax includes both tax sharing and ‘own-source’ tax revenues.

Figure 3: Degree of Tax Revenue Decentralisation 1999 – 2001

(as a percentage of their Total Revenues)



Source: Stegarescu (2005)

In fact, it is often desirable to impose fixed long-term revenue splits in tax sharing systems. The primary argument in favour of tax sharing vis-à-vis grants is that tax sharing can better facilitate regional development by providing positive incentives for local politicians to boost the tax base/economic growth within their jurisdiction. Policies and innovations which improve the tax base within their region (for example policies which encourage inward migration, innovation, business start-ups etc) increase the revenues they receive, while policies which harm the tax base reduce revenues. In contrast, no such incentive mechanisms tend to be in place in grant systems and a dependency culture can emerge – see The Economist (2006) for a critique of the funding of UK devolution.

When sharing revenues from Income Tax, Business Tax etc, improvements in regional economic performance (and hence the tax base) bring about direct increases in regional taxation equal to the increase in the total tax take multiplied by the regional government's respective 'share'. However, a critical component of this incentive mechanism is the belief on the part of regional politicians that the additional revenues raised through improved regional economic performance will not be captured by the centre. Without pre-determined fixed shares, the centre could continually alter the shares they and the sub-central governments receive so that following any increase in the regional tax base (and hence total tax revenue for a given constant tax rate), the amount allocated to sub-central

governments would not change, with the centre capturing the additional resources instead. Clearly, in such a scenario, the incentive effects provided by tax sharing are lost. Furthermore, the EU recommends that “in general, [tax sharing systems] should be provided for by law or decided on in the light of clear criteria laid down by law. The government’s discretion in calculating and effecting transfers should be reduced in order to avoid objectivity and credibility problems”, EC (2005).

‘Piggy-back’ or ‘overlapping’ taxes are sometimes referred to in the literature as tax sharing. With such taxes, common in Scandinavia, sub-central governments are permitted within limits to alter the tax rate (but not the tax base) set by the centre. For example in Norway, the central government sets an ‘upper’ limit for local income tax rates and local governments are permitted to raise income tax within their jurisdiction to this limit⁴. Strictly speaking these revenues are slightly different from the tax sharing systems looked at in this paper, nevertheless, as we will see our analysis can be extended to such taxes.

3. Measuring the Degree of Effective Central Control

3.1 The Basic Framework

In order to highlight the differences in effective central control under alternative decentralisation regimes, we construct a simple stylised budgetary accounting framework. While many of the assumptions are undeniably unrealistic, their use serves to highlight the important differences between the various decentralisation regimes and more specifically, the ability of the central government to manage national fiscal policy in times of fiscal and/or macroeconomic stress. More complex models are possible but the advantage of our approach is in the clear illustration of the key issues without becoming distracted by discussions of unnecessary complications.

The focus of the paper is upon the extent of central control during periods of macroeconomic reform⁵. More specifically, we examine national fiscal consolidation attempts, defined as a deliberate effort by the central government to substantially reduce the national fiscal deficit or increase the surplus⁶. Our motivation for this approach is two fold. Firstly, by adopting this methodology we are best placed to highlight the subtle

⁴ Figure 3 does not distinguish between such taxes and ‘truly’ autonomous taxes.

⁵ The impact of decentralisation on economic reforms is discussed in Treisman (1999).

⁶ In Europe especially, fiscal consolidations, their implications and the factors which contribute to their success, remain highly relevant as countries tackle weakening fiscal positions and ageing populations.

differences between grants and tax sharing and secondly, by focussing on a particular case study we can clearly observe the important implications of our analysis from both a theoretical and practical viewpoint.

We begin by assuming that there are two tiers of government, the centre (C) and the sub-centre (S)⁷. Each tier of government undertakes expenditure (E), denoted CE and SE respectively. We assume that central expenditure (CE) is comprised of two components: non-cyclical (or autonomous) expenditure α and cyclical expenditure $\beta(y)$: where y is the deviation in output from the natural rate ($y = \ln Y - \ln Y^*$). Thus, in this simple framework with a zero output gap, cyclical expenditures are zero. For simplicity we assume that the parameter β is fixed and that government expenditures do not impact on output. By implication, the central government only has discretionary control over the non-cyclical component of their expenditures α . Thus CE can be defined as:

$$CE = \alpha + \beta(y) \quad (1.1)$$

$$\text{where, } \frac{dCE}{dy} = \beta'(y) < 0 \quad (1.2)$$

We assume that while output directly affects the fiscal balance, changes in fiscal policy have no immediate impact on output. The inclusion of output in this way is simply to generate a negative fiscal position that requires action. We could for example let fiscal policy affect output but in a way in which would retain a negative fiscal balance or we could simply assume that the central fiscal position is negative at the outset and adjustment is necessary, perhaps to meet EMU criteria.

In contrast, and without loss of generality, we assume that sub-central expenditure (SE) is not influenced by the economic cycle⁸. Both SE and CE represent current expenditures; there are no capital investments.

The centre raises revenue through taxation CT, which can also be broken into non-cyclical and cyclical taxation components, δ and $\varphi(y)$ respectively⁹. Thus CT can be defined as

⁷ For simplicity we assume that there is only one sub-central government; the number of sub-central governments is unimportant. Our goal is to demonstrate the level of central control over the sub-central tier as a whole, irrespective of the number of sub-central units.

⁸ Again, this assumption aids simplification but does not alter the key parts of our analysis. The standard fiscal federalism literature (for example, Musgrave (1959), Oates (1972)) argues that sub-central fiscal policy should be a-cyclical, with stabilisation reserved for central governments. For an empirical study of the cyclicity of sub-central fiscal policy see Wibbels and Rodden (2005).

$$CT = \delta + \varphi(y) \quad (1.3)$$

$$\text{where, } \frac{dCT}{dy} = \varphi'(y) > 0 \quad (1.4)$$

In contrast, the sub-centre raises their revenue (SR) either through own-source non-cyclical taxation (ST) or via inter-governmental transfers. The latter can either be in the form of grants (SG) or via revenues from tax sharing (ST_{share}) arrangements. For simplicity, we assume that under each scenario (e.g. grants, full decentralisation etc), all sub-central revenues (SR) are raised from a particular single source, e.g. autonomous taxation, grants etc.

To complete the budgetary framework we assume that the nation cannot issue debt. Given the assumption of zero capital goods and the lack of a dynamic framework, this translates itself into a simple balanced national/general budget requirement. However, a ‘fiscal deficit’ within a particular tier of government can be financed by a parallel surplus at the other tier. Thus for example, sub-central governments could run a deficit provided that the centre agreed to fully finance these excess expenditures by central revenues or vice versa¹⁰.

We assume that the centre has a pre-determined ‘optimal’ level of both autonomous expenditure and revenue denoted $\bar{\alpha}$ and $\bar{\delta}$ respectively. Similarly they have pre-determined ‘optimal’ levels of sub-central expenditure ($S\bar{E}$) and revenue ($S\bar{R}$). Given that central governments are accountable to the national electorate, and are ultimately responsible for macroeconomic stability, they are likely to have an optimal preference for the sub-central policy stance which may or may not be consistent with the sub-centre’s preferences. In the UK for example, much of local government reform over the last two decades has been in response to policies being pursued by local governments which were inconsistent with those of the centre. These reforms have clearly been designed to give the Westminster government greater control thereby reducing conflict over policy¹¹.

⁹ As with expenditure, y is the deviation in national income from the natural rate ($y = Y - Y^*$) and the parameter φ is assumed to be fixed.

¹⁰ In such a scenario, the resources from the central government’s fiscal surplus can be transferred to the sub-centre. Without this ‘additional’ transfer, sub-central expenditures (revenues) would have to be cut (increased).

¹¹ The frequent use of ‘capping’ powers on the autonomous tax revenues of UK Local Governments is a prime example – see Emmerson *et al.* (1998).

In contrast, the sub-central tier is assumed to have ‘optimal’ levels of their own expenditure and revenue, $S\hat{E}$ and $S\hat{R}$ but has no concern over the level of central government expenditure and revenue. This final assumption is not critical and our analysis would not alter if we specified an optimal level of central expenditure/revenue from the viewpoint of sub-central politicians. In this case, sub-central politicians may favour higher or lower central expenditures etc as they have no means of influencing the fiscal decisions of the centre given that the intergovernmental financial transfers only flow from the centre to the sub-centre and not vice versa. In practice, sub-central politicians tend to have limited control over central government fiscal policy and for the most part, with some exceptions, are likely to be most concerned with the expenditures/revenues within their local jurisdiction.

Given the likelihood of different preferences and political motivations etc, optimal sub-central expenditures as viewed by the sub-centre may not necessarily coincide with the equivalent optimal level preferred by the centre (i.e. $S\hat{E} \neq S\bar{E}$ and $S\hat{R} \neq S\bar{R}$). We assume that each government's preferences for expenditure and revenue are single-peaked¹².

The general government (or national) fiscal balance can be written as follows:

$$G_{bal} = CT + SR - CE - SE \quad (1.5)$$

which by substituting 1.1 and 1.3 can be re-arranged to give:

$$G_{bal} = \delta + \varphi(y) + SR - \alpha - \beta(y) - SE \quad (1.6)$$

To analyse the budgetary accounting implications of alternative fiscal decentralisation structures during consolidation attempts, we introduce a negative output ‘shock’. This forces firstly the central government and then by implication, the general government fiscal positions into deficit. Given our constraint that the general government fiscal position must always be in balance, consolidation is required.

To illustrate this, suppose that initially both the central and sub-central fiscal positions are balanced but there is a negative shock to output y^s where $y^s < 0$. Consequently, given equations (1.1) and (1.3), central government expenditures will rise (by the amount $\beta(y^s)$),

¹² Therefore, if actual expenditure differs from optimal expenditure any policy option which will more closely align the two will be adopted.

while central tax revenues will fall (by the amount $\varphi'(y^s)$). Thus, G_{bal} given by (1.6) will be negative and hence a national consolidation to expenditures and revenues is necessary (either at the central, sub-central or both tiers of government) - i.e.

$$G_{bal} = \delta + \varphi(y^s) + SR - \alpha - \beta(y^s) - SE < 0 \quad (1.6a)$$

In what follows we compare and contrast the ability of the central government to respond to this situation by examining the policy instruments available to them under alternative sub-central financial arrangements.

3.2 Centralisation

In the first scenario we assume that all fiscal instruments are assigned to the central level – i.e. there is no decentralisation. In this case, the expenditure and revenue denoted SE and SR are effectively individual components of discretionary central government expenditure and revenue. Thus, central government has direct control over both their ‘own’ instruments δ and α , but in addition, sub-central expenditure and revenue (SE and SR). Given the preferences of the central government discussed above, these expenditures and revenues will initially be set equal to \overline{SE} and \overline{SR} respectively.

Following the negative output shock the central fiscal balance will be negative:

$$C_{bal} = \overline{\delta} + \varphi(y^s) - \overline{\alpha} - \beta(y^s) < 0 \quad (2.1)$$

which in turn feeds through to a negative general government balance:

$$G_{bal} = \overline{\delta} + \varphi(y^s) + \overline{SR} - \overline{\alpha} - \beta(y^s) - \overline{SE} < 0 \quad (2.2)$$

In such a situation the central government has a number of fiscal instruments it can use to restore general balance. Firstly, the centre can adjust their ‘own’ non-cyclical expenditures and revenues denoted by δ and α respectively. By increasing δ and cutting α by appropriate amounts they can restore equilibrium. Secondly a surplus can be generated on the ‘sub-central’ balance, compensating for the deficit at the central level: i.e. –

$$SC_{bal} = SR^{new} - SE^{new} > 0 \quad (2.3)$$

where it is possible that,

$$-C_{bal} = SC_{bal}^{new} \quad (2.4)$$

Thus the centre has the ability to adjust both their ‘own’ expenditures and revenues together with those of the sub-centre. Clearly this simple framework cannot determine the actual composition of the adjustment (the exact change will depend upon utility costs associated with moving away from ‘optimal’ levels of central and sub-central expenditures and revenues). It is sufficient to note however, that under a system of centralisation the centre is able to effectively control both central and sub-central instruments to assist in any national fiscal adjustment.

The case of full centralisation is a useful benchmark against which alternative scenarios of decentralisation can be compared. We begin with the polar opposite case, full autonomous fiscal decentralisation.

3.3 Full Decentralisation

Under full decentralisation, the sub-central tier has complete fiscal autonomy in that their expenditures (SE) are financed entirely from own-source taxation (ST).

In this scenario, the sub-central government will set $SE = S\hat{E}$ in line with their pre-determined exogenous preferences. Consequently, given their inability to issue debt this implies an optimal level of revenue $SR = S\hat{T}$ so that, $S\hat{E} = S\hat{T}$. In such a scenario, the general government budget balance,

$$G_{bal} = \delta + \varphi(y) + SR - \alpha - \beta(y) - SE \quad (3.1)$$

where, $SR = S\hat{T}$ and $SE = S\hat{E}$ can be re-written to give,

$$G_{bal} = \bar{\delta} + \varphi(y) + S\hat{T} - \bar{\alpha} - \beta(y) - S\hat{E} \quad (3.2)$$

Given $S\hat{E} = S\hat{T}$, the general government fiscal position in equilibrium becomes,

$$G_{bal} = \bar{\delta} + \varphi(y) - \bar{\alpha} - \beta(y) \quad (3.2')$$

As before, following a shock to output, the central fiscal balance is negative, forcing the general government balance (3.2) to also be negative:

$$G_{bal} = \bar{\delta} + \varphi(y^s) + S\hat{T} - \bar{\alpha} - \beta(y^s) - S\hat{E} < 0 \quad (3.2a)$$

and given $S\hat{E} = S\hat{T}$,

$$G_{bal} = \bar{\delta} + \varphi(y^s) - \bar{\alpha} - \beta(y^s) < 0 \quad (3.2b)$$

In contrast to the situation under full centralisation, the central government's ability to respond to the shock is more constrained. The centre is unable to run a surplus on the sub-central fiscal position to help finance their deficit brought on by the negative shock to output. Under full fiscal autonomy, any such surplus is run at the discretionary will of the sub-centre. However, from the sub-centre's perspective, their fiscal policy has been unaffected by the shock and hence they face no direct incentive to run a surplus (either by cutting expenditures or increasing revenues), as this would mean moving away from their 'optimal' levels $S\hat{E}$ and $S\hat{T}$. In this instance, as can be observed from (3.2b), the only fiscal instruments available to the centre are autonomous expenditure (α) and revenue (δ). The policy instruments available to the centre to respond to macroeconomic shocks are more limited than under centralisation.

In the following section we depart from these two polar cases and assess the level of effective central control in decentralised systems where the central government plays a key role in financing sub-central fiscal policy.

3.4 Grant Finance

For simplicity, we assume that all sub-central revenues are raised from central government block grants (i.e. no autonomous revenue raising power). Thus, SR = SG.

Under a system of grant finance, the level of grant assigned to the sub-central government is typically determined unilaterally by the centre, sometimes through needs assessment

mechanisms. However, more often than not, even such ‘formulas’ are often highly dependent on the discretion of the centre – see IMF (1997). While in certain circumstances sub-central governments may have limited influence or bargaining power regarding their grant allocation, the ultimate decision on how much each sub-central government receives, typically remains the sole prerogative of the centre. Unlike revenues that arise as tax sharing revenues, revenues from intergovernmental grants “are likely to be most subject to yearly central government discretion in their determination” - Rodden (2003).

To best capture this, we can interpret grant finance as a situation in which the centre raises an amount of revenue, via central taxation, to fund a pool of revenues (which we will denote X). In turn, it uses these revenues to fund transfers to sub-central tiers in the form of grant allocations (SG). At the outset, we assume that the amount the centre raises is fully transferred to the sub-centre (i.e. $X = SG$)¹³. Given the centre’s pre-determined preferences for SE, \overline{SE} this yields:

$$X = SG = \overline{SE} \quad (4.1)$$

$$\text{when, } \hat{SE} \geq \overline{SE}$$

Provided that the ‘optimal’ level of SE as viewed by the centre (\overline{SE}) is less than or equal to the optimal level of SE as viewed by the sub-centre (\hat{SE}), actual sub-central expenditure will equal \overline{SE} . Otherwise the sub-centre would set $SE = \hat{SE}$ and there would be a sub-central surplus of $X - \hat{SE}$ ¹⁴:

$$X = SG > SE = \hat{SE} \quad (4.1a)$$

$$X - \hat{SE} = S_{surplus}$$

$$\text{when, } \hat{SE} < \overline{SE}$$

Under a system of grant financed sub-central expenditure the general government budget constraint can be re-written as

¹³ If $X > SG$ at the outset, the centre would be running a pointless surplus.

¹⁴ One can reasonably expect that sub-central politicians’ optimal level of sub-central expenditure will be higher than that of central government politicians. Empirical evidence of the ‘flypaper’ effect (see Hines and Thaler (1996) and Darby et al. (2005a)) shows that increases in grants bring about equal increases in expenditure, suggesting that the actual level of sub-central expenditure is lower than the optimal level from the viewpoint of sub-central governments. While the existence of ‘targets’ and guidelines suggests that the centre may be concerned about ‘low’ expenditure in certain areas, for the most part, we would expect that sub-central preferences for total expenditure will be higher.

$$G_{bal} = \bar{\delta} + \varphi(y) + X - \bar{\alpha} - \beta(y) - SG \quad (4.2)$$

If $S\hat{E} \geq \bar{S}E$, given 4.1, the budget constraint in equilibrium is identical to that under full decentralisation – i.e.:

$$X = SG = \bar{S}E \quad (4.1)$$

Hence,

$$\begin{aligned} G_{bal} &= \hat{\delta} + \varphi(y) - \hat{\alpha} - \beta(y) + [X - S\hat{E}] \\ G_{bal} &= \hat{\delta} + \varphi(y) - \hat{\alpha} - \beta(y) + [X - SG] \\ G_{bal} &= \hat{\delta} + \varphi(y) - \hat{\alpha} - \beta(y) \end{aligned} \quad (4.3)$$

While if $S\hat{E} < \bar{S}E$, given 4.1a:

$$\begin{aligned} X &= SG > SE = S\hat{E} \\ X - S\hat{E} &= S_{surplus} \end{aligned} \quad (4.1a)$$

the general government budget constraint becomes –

$$G_{bal} = \bar{\delta} + \varphi(y) - \bar{\alpha} - \beta(y) + [X - S\hat{E}] \quad (4.4)$$

Following a shock to output, as before both the central and general government fiscal balances move into deficit:

$$G_{bal} = \bar{\delta} + \varphi(y^s) + X - \bar{\alpha} - \beta(y^s) - SE < 0 \quad (4.4a)$$

As above, to balance the budget a consolidation is necessary. Clearly, one option for the centre is to adjust their own non-cyclical expenditure (α) and revenue (δ). However, in contrast to the full autonomy case discussed above, there is now an important additional instrument they can exploit. Following the shock, the centre can drive a wedge between the money raised in the revenue pool assigned for sub-central grant transfers (X) and the actual level of grant (SG) transferred. That is, $X \neq SG$. Most importantly, by cutting the level of grant SG (while holding X constant), the central government can in effect

generate a fiscal ‘surplus’ at the sub-central level which can be used to compensate for the deficit at the central level.

To illustrate this point, consider the case where $S\hat{E} \geq S\bar{E}$ - i.e. the perceived optimal sub-central expenditure levels are higher for sub-central as oppose to central administrations. As discussed above, this corresponds to $X = SG = S\bar{E}$. Consequently, any reduction in SG (below X) will bring about a corresponding fall in SE (as the starting point $S\bar{E}$ is below the sub-central’s optimal level of expenditure $S\hat{E}$ and assuming single-peaked preferences). By reducing SG to SG^{new} and hence SE to SE^{new} , the central government can retain the difference $X - SG^{new}$ as a contribution to the consolidation attempt. Thus in effect, the central government can generate a cut in national expenditure for the same level of national revenue with the cut in expenditure being skewed to the sub-central tier. In an extreme case the government could set $X - SG^{new}$ such as to eliminate the general government deficit – i.e.

$$G_{bal} = \bar{\delta} + \varphi(y^s) - \bar{\alpha} - \beta(y^s) + [X - SG^{new}] = 0 \quad (4.4b)$$

In essence, the centre is able to ‘force the hand’ of the sub-central government to cut their expenditures. This result is consistent with empirical evidence. For example, in Darby *et al.* (2005b) strong evidence was found of central governments exploiting a reverse ‘flypaper’ effect during national consolidation attempts by forcing sub-central governments to cut their expenditures by significantly tightening their grant allocations.

Alternatively, by raising the amount of revenue located in the pool of resources for sub-central transfers (X), provided that this increase in revenue is not passed on to the sub-centre in the form of grants, the centre is again able to generate a surplus on sub-central finances¹⁵. That is, the centre could raise X to X^{new} and keep SG constant, retaining the difference $X^{new} - SG$ as surplus. Of course in this case the burden of adjustment would no longer be borne by the sub-centre as SE would remain unaffected. In an extreme case the government could set $X^{new} - SG$ to be sufficient to eliminate the general government deficit generated by the output shock – i.e.

$$G_{bal} = \bar{\delta} + \varphi(y^s) - \bar{\alpha} - \beta(y^s) + [X^{new} - SG] = 0 \quad (1.6b)$$

¹⁵ Any increase in X, passed on to sub-central governments in the form of higher grants will automatically lead to a rise in sub-central expenditures SE.

Thus under a system of expenditure decentralisation financed by grants, the centre's effective control of aggregate national fiscal policy resembles that under full centralisation. By raising X they can in effect increase sub-central revenues for a given level of national expenditure or by cutting SG force a cut to sub-central expenditure for a given level of national revenue.

If $\hat{SE} < \bar{SE}$ that is (4.1a), the level of grant exceeds optimal sub-central expenditures at the outset and hence the central government may use this sub-central surplus to contribute to their consolidation effort without any need to alter sub-central grants. They could of course increase this sub-central surplus by increasing the resources for sub-central transfers (X). To induce a cut in sub-central expenditures, grants would have to be cut by an amount such that $SG < \hat{SE}$.

Finally, note that when sub-central expenditures are financed by block grants, it is only the level of expenditure that can be controlled by the centre. The sub-centre will be able to alter the composition of this expenditure as they so wish. In contrast, if the grants are specific grants then the centre is able to control both the total size of adjustment and its composition. This can be useful when profligacy, in particular elements of sub-central fiscal policy, cause the central government concern or as found in Darby *et al.* (2005b) sub-central governments have a bias toward cutting priority spending areas such as capital expenditures during periods of consolidation.

In summary, when sub-central expenditures are financed by grants, the level of central government effective control of national fiscal balances is similar to that under full centralisation. The centre is able to adjust not only their 'own' expenditures and revenues but via manipulation of the grant system those of the sub-centre. In Section 3.5 we examine how this outcome differs to that observed under a system of tax sharing.

3.5 Tax sharing

As in the case of grants, we assume that the sub-centre receives its entire resource allocation from tax sharing revenues (i.e. they have no autonomous revenue raising power). Thus, $SR = ST_{\text{share}}$. Further, in line with the majority of tax sharing arrangements (for example, Germany and Austria), the centre and the sub-centre are assumed to raise these 'shared' revenues from a common pool of resources with the shares assigned to each

tier of government pre-determined and fixed¹⁶. Thus for example, a 50:50 split requires that 50% of all revenues raised from shared tax source be allocated to the sub-centre with the centre retaining the remaining 50%.

For simplicity we assume that the tax sharing arrangement is such that the common pool of resources is a non-cyclical revenue pool with the tax share division 1:0 in favour of the sub-centre¹⁷. In other words, all tax revenues received from this pool of resources are assigned to the sub-centre. Therefore, X (the pool of resources used to finance sub-central expenditure) equals ST_{share} .

To remain consistent with our earlier discussions and like most tax sharing arrangements, we assume that the centre unilaterally controls the size of the pool of resources that the sub-centre receives via the tax sharing arrangement. Therefore, the centre determines both the tax base and tax rate and hence ultimately the total revenue raised. The sub-centre is assumed to have no authority over the raising and collection of these revenues. It is therefore, justifiable to view such revenues as purely a central to sub-central transfer of fiscal resources.

For instance, given the centre's pre-determined preferences for SE, \overline{SE} , the centre can determine the appropriate tax base and rate that will give:

$$ST_{share} = \overline{SE} \quad (5.1)$$

provided, $\hat{SE} \geq \overline{SE}$.

If the centre's 'optimal' level of SE (\overline{SE}) is less than or equal to the optimal level of SE as viewed by the sub-centre (\hat{SE}), actual sub-central expenditure will equal \overline{SE} . That is, the pool of resources assigned to the sub-centre equals the amount spent by the sub-centre $ST_{share} = \overline{SE}$. Therefore, as under a system of grants (and full centralisation), the centre is able to determine the exact level of sub-central expenditure even if this falls short of what the sub-centre would ideally like. Moreover, by cutting ST_{share} the centre can (just like under a system of grants) 'force the hand' of the sub-centre to cut expenditure (SE). Clearly, in the alternative scenario where the centre's optimal level of SE (\overline{SE}) exceeded

¹⁶ See Section 2 for a discussion.

¹⁷ More complicated revenue splits (e.g. 75:25 etc) are possible but do not alter our analysis.

the sub-centre's optimal level (\hat{SE}), sub-central politicians would set $SE = \hat{SE}$ generating a surplus equal to the difference $ST_{share} - \hat{SE}$:

$$\begin{aligned} ST_{share} &> SE = \hat{SE} \\ ST_{share} - \hat{SE} &= S_{surplus} \end{aligned} \quad (5.1a)$$

Therefore, at a first glance, tax sharing and grants appear identical. However, there are in fact important subtle differences which we outline below.

Under a system of tax sharing the general government budget constraint 1.6 can be re-written as

$$G_{bal} = \delta + \varphi(y) + ST_{share} - \alpha - \beta(y) - SE \quad (5.2)$$

If $\hat{SE} \geq \bar{SE}$, the budget constraint is identical to that under full decentralisation – i.e.:

$$ST_{share} = \bar{SE} \quad (5.1)$$

Hence,

$$G_{bal} = \bar{\delta} + \varphi(y) - \bar{\alpha} - \beta(y) \quad (5.3)$$

While if $\hat{SE} < \bar{SE}$, given 5.1a:

$$\begin{aligned} ST_{share} &> SE = \hat{SE} \\ ST_{share} - \hat{SE} &= S_{surplus} \end{aligned} \quad (5.1a)$$

the general government budget constraint becomes –

$$G_{bal} = \bar{\delta} + \varphi(y) - \bar{\alpha} - \beta(y) + [ST_{share} - \hat{SE}] \quad (5.4)$$

As above, suppose there is a negative shock to output and both the central and general government fiscal balances (5.2) move into deficit:

$$G_{bal} = \bar{\delta} + \varphi(y^s) + ST_{share} - \bar{\alpha} - \beta(y^s) - \hat{SE} < 0 \quad (5.5)$$

As in the previous examples, one option open to the centre is to adjust their ‘own’ non-cyclical expenditure (α) and revenue (δ). However, unlike the situation of grants (or indeed full centralisation) these are likely to be the only policy options available. Why?

Under a system of tax sharing with fixed pre-determined shares, provided that $\hat{SE} \geq \bar{SE}$ (the most realistic case), the centre is unable to alter their fiscal instruments/elements of sub-central control in such a manner that would generate a sub-central fiscal surplus. While the centre can ‘force the hand’ of the sub-centre to determine the actual level of expenditure they cannot force the creation of a fiscal surplus.

To illustrate this, when $\hat{SE} \geq \bar{SE}$ this corresponds to $ST_{share} = \bar{SE}$ (so $\hat{SE} > ST_{share}$) and the general government balance can be re-written as:

$$G_{bal} = \bar{\delta} + \varphi(y^s) + ST_{share} - \bar{\alpha} - \beta(y^s) - \bar{SE} < 0 \quad (5.6)$$

Suppose the centre tried to increase the pool of resources from which ST_{share} is drawn from (i.e. increase X to X^{new}), keeping the ST_{share} constant and hence retaining the additional revenue for itself (i.e. $X^{new} - ST_{share}$). In effect, this can be seen as an attempt to drive a wedge between the pool of resources for sub-central transfers (X) and the amount actually redistributed (ST_{share}). Such action is however, not possible without the central government violating the tax sharing agreement (which requires that the share of revenues from the common pool distributed between the central and sub-central tiers remain fixed). While the centre has full authority to alter the size and composition of the common pool of resources used in the tax sharing arrangement, it cannot alter the shares assigned to each tier. In our case the tax share was assumed to be set at 1:0 in favour of the sub-centre (so $X = ST_{share}$ at all times). If the centre retained an amount of this additional revenue, their share of the shared tax would be non-zero.

If $\hat{SE} > ST_{share}$, any attempt to raise revenues by increasing ST_{share} will fail to improve the general government balance (G_{bal}). The increase in ST_{share} would be matched by a compensating increase in SE as sub-central politicians more closely align actual expenditure with their own desired expenditure \hat{SE} ¹⁸. Thus, any sub-central fiscal surplus generated from increased revenues would be cancelled out by the increased expenditures.

¹⁸ This implication is discussed in De Mello (2000). He points out that “in the case of revenue sharing arrangements, every time a central government raises taxes to improve its own fiscal position, sub-national governments receive a corresponding revenue benefit which they are free to spend.”

In effect, if $S\hat{E} > ST_{share}$ then up to the point where $ST_{share} = S\bar{E}$ the general government budget balance (5.6) can be re-written as:

$$G_{bal} = \bar{\delta} + \varphi(y^s) - \bar{\alpha} - \beta(y^s) < 0 \quad (5.7)$$

Therefore, the fiscal instruments available to the central government are limited to their ‘own’ autonomous expenditure (α) and revenue (δ). Note that this is identical to the situation under full decentralisation. Ultimately, if $ST_{share} = S\hat{E}$ then any increase in ST_{share} would improve G_{bal} as the additional revenues would no longer be spent on higher expenditures as optimality (from the viewpoint of sub-central politicians) has been reached. As mentioned above however, if $S\hat{E}$ exceeds $ST_{share} = S\bar{E}$ by a substantial amount, this option may be unrealistic.

An alternative strategy for the centre instead of increasing revenue, is to ‘force the hand’ of the sub-centre to cut their expenditures. We can apply the same reasoning in the case of grants in so far as the centre can cut ST_{share} . While this will bring about a corresponding fall in SE (as the starting point $S\bar{E}$ is below the sub-central’s optimal level of expenditure $S\hat{E}$), in turn it implies a cut in national revenue given the pre-determined fixed tax shares (i.e. $X = ST_{share}$). Therefore, both X and ST_{share} must fall. The two effects (cut in expenditure and cut in revenue) cancel each other out, leading to no improvement in the general government deficit (G_{bal}). Therefore, under a system of tax sharing with pre-determined or fixed tax shares, the centre cannot force a cut in sub-central expenditures for a given level of national revenue.

It is clear that this result is driven by the assumption of pre-determined or fixed tax shares. If the centre could unilaterally alter the revenue split between themselves and sub-central governments (i.e. $X \neq ST_{share}$) then a similar outcome to grants would be reached. In the context of the above analysis, the centre would be able to drive a wedge between the total amount raised (X) and the amount ‘allocated’ to the sub-centre (ST_{share}). However as previously discussed, the revenue splits from tax sharing are fixed in the vast majority of cases and in fact without fixed shares, the primary advantage of tax sharing over grant finance (i.e. improved incentives for local politicians) would be lost.

As an important aside, central governments may more generally be less willing to interfere with revenues from tax sharing arrangements than with grant allocations. This is for reasons similar to those highlighted above in our discussion on revenue splits from tax sharing which are almost universally kept fixed. It is argued that the revenue raised from tax sharing is often interpreted as having been ‘earned’ by a particular region/government while grants on the other hand, create the appearance of funding by non-residents. This is especially likely to be the case if the shared tax-base is income or corporation profits; two of the most commonly shared taxes. In short, being seen to take resources from a particular region as opposed to reducing resources given to this region can be interpreted quite differently by voters¹⁹. For example, one of the main motivations behind the decision to share revenues from income tax in Norway, was to “encourage sub-central governments to increase their tax base by implementing ‘good government’ in order to gain from high revenues in the future”²⁰. Consequently, attempts to reduce the revenues sub-central central governments receive from this tax sharing have been strongly resisted and have the potential to be politically damaging.

Returning to our analysis, if $\hat{SE} < \bar{SE}$ (i.e. optimal sub-central expenditures were less than the centre would like) any increase in ST_{share} to ST_{share}^{new} could lead to an automatic improvement in G_{bal} . In this situation, the increase in revenue would fail to generate an increase in sub-central expenditure as it is already at optimum. The difference between the new higher ST_{share}^{new} and \hat{SE} could be retained as surplus (i.e. $ST_{share}^{new} - \hat{SE}$). In an extreme case the government could set $ST_{share}^{new} - \hat{SE}$ to be sufficient to eliminate the general government deficit generated by the output shock – i.e.

$$G_{bal} = \bar{\delta} + \varphi(y^s) - \bar{\alpha} - \beta(y^s) + [ST_{share}^{new} - \hat{SE}] = 0 \quad (5.8)$$

However, it is still the case that the centre is unable to bring about a cut in sub-central expenditures without altering ST_{share} . In this case, a cut in SE will only occur when ST_{share} falls by a sufficiently large amount such as to generate $ST_{share} < \hat{SE}$. Once again, with fixed tax shares, any attempt by the centre to cut sub-central expenditure requires a corresponding fall in national revenue.

¹⁹ The Fiscal Illusion literature argues that certain ‘types’ of fiscal policy may be viewed differently by the private sector even if they have the same effect on the economy. For a discussion and theoretical application to intergovernmental grants see Oates (1979).

²⁰ See IMF (1997).

It is clear that tax sharing and grant based sub-central financing systems imply very different degrees of effective central government control over national fiscal policy. Only in the special and probably unrealistic case of optimal expenditure from the perspective of sub-central politicians being less than that which the central government would like, can sub-central balances be used to assist in any consolidation attempt. Even then, any adjustment is limited to increases in sub-central revenue. This outcome is more akin to the situation under full decentralisation than under grants²¹.

The tax sharing structure that we have outlined in the above is such that the sub-central government has no control to alter the tax rate or the tax base. As mentioned earlier, in certain countries sub-central governments are able to set (within limits) an autonomous tax rate on a tax base which they share with the centre – i.e. ‘piggy-back’ taxes. For example, the system of income tax sharing common in Scandinavian countries. In practice, nearly all sub-central governments set their tax rates at the centrally determined ‘ceiling’ level – see Joumard, and Suyker (2002). With this form of tax sharing the analysis discussed above still holds. In order to increase sub-central taxation revenues the centre must lift the ‘ceiling’ level so that the sub-centre can set a higher tax rate, however if the ceiling was binding, the ability to raise higher revenues will lead to increased expenditures. On the other hand, a cut in sub-central expenditure would require a lowering of the ‘ceiling’ however, this would lead to a fall in sub-central and hence by implication, national revenues²². Therefore, an identical result is reached; the central government’s ability to manipulate sub-central fiscal policy for national adjustment is relatively constrained.

In summary, through using some simple budgetary accounting we have shown that there is an important difference between grants and tax sharing in the context of a national consolidation attempt. Under a system of grant finance the central government is able to ‘force the hand’ of the sub-centre to cut their expenditures for a given level of national revenue. This is not possible in a tax sharing system as any attempt to lower sub-central expenditure requires a reduction in national revenue. Thus, while a system of grants can

²¹ Moreover, revenues from tax sharing are almost always block transfers and are not tied to specific elements of expenditure. Therefore, unlike specific grants the centre is unable to control either the level or composition of expenditure.

²² A similar result holds under the UK system of ‘capping’ local authorities council tax bills. Capping alone will be insufficient to assist any consolidation as any curtailment of revenue will only bring expenditure in line with this new level of revenue.

be closely aligned to a system of full centralisation, a tax sharing arrangement substantially reduces the de facto power of the central government to consolidate national fiscal policy.

4. Conclusion

The presence of vertical imbalances and intergovernmental transfers, imply that central governments retain a degree of de facto control over sub-central fiscal policy that would not be possible under complete fiscal decentralisation. While there are clearly issues of diluted local responsibility and accountability, central control can be beneficial in preventing fiscally profligate sub-central authorities from de-stabilising the national economy. Of more direct relevance to this paper, central control can be advantageous during periods of economic reform or adjustment. Ultimately, the balance between these two concerns has to be assessed relative to the political and economic factors of a particular country and/or region.

It is clear that any relationship between tiers of government depends critically upon the financial linkages that exist between them. The current consensus in the literature has been that intergovernmental transfers whether they stem from a block grant, matching grant or tax sharing, imply a similar degree of central control over sub-central fiscal policy. In this paper however, we have shown that this is not the case. While many of the differences between full centralisation and decentralisation are obvious, the contrasts between grants and tax sharing are more subtle. While we recognise, and do not dispute, the identified similarities between grants and tax sharing in terms of the freedom of sub-central governments to pursue their own fiscal policy strategies, our analysis reveals important differences in the level of central control. With grants central governments are able to ‘force the hand’ of sub-central governments not only to make expenditure cuts but to run a fiscal surplus. Under tax sharing, only the former is possible. This asymmetry implies that tax sharing regimes have a lower degree of de facto central control than grant systems. The exception to this rule is when the centre has the capacity to alter the revenue split between tiers during the setting of the annual budget. However, as discussed in the text, this scenario is not only uncommon but would work against the very benefits of efficiency and accountability which tax sharing systems provide.

In addition to providing important implications for academic research, such as guidance on appropriate comparisons of decentralisation levels across countries, our analysis has practical implications for the design of fiscal institutions. Both tax sharing and grants represent a reduction in sub-central financial autonomy relative to full tax autonomy. However, switching from grant finance to tax sharing (as is advocated by some economists in the UK – see Hallwood and MacDonald (2005)) would represent a reduction in central government control of sub-central and by implication national fiscal policy. Therefore, the widely documented gains from improved sub-central efficiencies under tax sharing may be offset by a loss of macroeconomic control. We believe that a fuller discussion of these potential tradeoffs is required prior to any institutional or financial reform.

References

- Darby, J., Muscatelli, V.A., and Roy, G., 2003, “Fiscal Federalism in the European Union”, in Jan Mønnesland (ed.), *European Research in Regional Science* 13, Special Issue on Regional Public Finance, Pion: London.
- Darby, J., Muscatelli, V.A., and Roy, G., 2005a, “How Do Sub-Central Governments React to Cuts in Grants Received from Central Governments? Evidence from a Panel of 15 OECD Countries”, *Centre for Public Policy for Regions Working Paper*, Number 1.
- Darby, J., Muscatelli, V.A., and Roy, G., 2005b, “Fiscal Federalism and Fiscal Consolidation: Evidence from an Event Study”, *Centre for Public Policy for Regions Working Paper*, Number 2.
- De Mello, L.R., 2000, “Fiscal Decentralisation and Intergovernmental Fiscal Relations: A Cross-Country Analysis”, *World Development*, Vol. 28, Number 2, pp. 365 – 380.
- Ebel, R.D and Yilmaz, S., 2002, “On the Measurement and Impact of Fiscal Decentralisation”, *Policy Research Working Paper*, Number 2809, World Bank; Washington D.C.
- Economist, The, 2006, “Lament for Scotland”, May 18th 2006.
- Emmerson, C., Hall, B., and Ridge, M., 1998, “The Impact of Expenditure Limitations on Local Government Spending: Evidence from the United Kingdom”, *IFS Working Paper*, Number W98/05, Institute of Fiscal Studies; London.
- European Commission, 2005, “Recommendation Rec(2005)1 of the Committee of Ministers to member states on the financial resources of local and regional authorities”, European Commission; Brussels.
- Fiva, J. H., 2005, “New Evidence on Fiscal Decentralisation and the Size of Government”, *CESifo Working Paper*, Number 1615, December 2005.
- Hallwood, P, and MacDonald, R., 2005, “Fiscal Federalism”, Chapter 5 in Coyle, Alexander, and Ashcroft (eds.), *New Wealth for Old Nations: Scotland’s Economic Prospects*, Princeton University Press.
- Hallwood, P., and MacDonald, R., 2006, “The Economic Case for Scottish Fiscal Autonomy: With or Without Independence”, The Policy Institute, Edinburgh.
- Hines, J., and Thaler, R.H., 1995, “The Flypaper Effect”, *Journal of Economic Perspectives*, Vol. 9, Issue 4 (Fall), pp. 217 – 226.
- IMF, 1997, *Fiscal Federalism in Theory and Practice*, Teresa Ter-Minassian (ed.), International Monetary Fund; Washington D.C.
- Joumard, I. and Suyker, W., 2002, “Enhancing the effectiveness of public expenditure in Norway”, *OECD Economics Department Working Paper*, Number 343, October, OECD; Paris.
- Musgrave, R., 1959, *The Theory of Public Finance*, McGraw-Hill; New York,
- Oates, W.E., 1972, *Fiscal Federalism*, Harcourt Brace Jovanovich; New York.
- Oates, W.E., 1979, “Lump-Sum Intergovernmental Grants Have Price Effects”, in P. Mieszkowski and W. Oakland (eds.), *Fiscal Federalism and Grants-in-Aid*, Brookfield, V.T: Edward Elgar.
- OECD, 2006, “A European Definition of Shared Taxes”, Note submitted to Delegates of the European Council Statistical Working Group for discussion at their meeting 12-13th

January 2006, OECD Network on Fiscal Relations Across Levels of Government, OECD; Paris.

Pola, G., 1999, "A Comparative View of Local Finances in EU Member Countries: Are there Any Lessons to be Drawn?", in: A Fossati and G Panella (eds.) (1999), *Fiscal Federalism in the European Union*, pp. 15 – 62, Routledge; London.

Rodden, J., 2002, "The Dilemma of Fiscal Federalism: Grants and Fiscal Performance around the World" *American Journal of Political Science*, Vol. 46.3, July, pp. 670 – 687.

Rodden, J., 2003, "Reviving Leviathan: Fiscal Federalism and the Growth of Government", *International Organisation*, Vol. 57, Fall, pp. 695 – 729.

Stegarescu, D., 2005, "Public Sector Decentralisation: Measurement Concepts and Recent International Trends", *Fiscal Studies*, Vol. 26, No. 3, pp. 301–333

Treisman, D., 1999, "Political Decentralisation and Economic Reform: A Game-Theoretic Analysis", *American Journal of Political Science*, Vol. 43, Number 2, pp. 488 – 517.

Wibbels, E., and Rodden, J., 2005, "Fiscal Decentralization and the Business Cycle: An Empirical Study of Eight Federations", MIT mimeo.

Strathclyde Discussion Papers 2006 Series

- 06-01 Eric Rahim
Marx and Schumpeter: A Comparison of Their Theories of Development
- 06-02 G Allan, P McGregor, J K Swales & K Turner
The Impact of Alternative Electricity Generation Technologies on the Scottish
Economy: An Illustrative Input-Output Analysis
- 06-03 Roy Grieve *with Comments from Ramesh Chandra*
Putting the Record Straight: Adam Smith, Allyn Young and the Division of
Labour
- 06-04 Grant Allan, Peter McGregor, Tim Stallard, Kim Swales and Karen Turner
Concurrent and Legacy Impacts from Establishing a Marine Energy Sector in
Scotland: A Computable General Equilibrium Analysis