

FISCAL DECENTRALISATION AND THE SIZE OF GOVERNMENT: A REVIEW OF THE EMPIRICAL LITERATURE

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Abstract

Within the public choice framework, it has been argued that decentralised authority over the provision and financing of certain public goods and services induces competitive pressure among different governmental units and consequently reduces the size of government. However, in many countries, fiscal decentralisation seems to have occurred almost exclusively through devolution of expenditure activities, without the accompanying devolution of the tax authority. We address this issue in detail, and discuss the repercussions of the resulting vertical fiscal imbalance on the total size of government. We also discuss alternative, demand-side channels of the influence of fiscal decentralisation on the size of government. In the empirical literature that we review, little consensus on the relationship between fiscal decentralisation and the size of government is reached.

Key words: the size of government, fiscal decentralisation, intergovernmental grants, sub-national expenditures, sub-national own-source revenues

1 Introduction

Fiscal decentralisation, in its purest form, presumes that sub-national governmental units are given the autonomy over the provision *and* financing of public goods and services. In a decentralised country, sub-national governments have discretion to govern their own budgets without interventions from the central level. In the last few decades many former socialist as well as developed centralist countries have started political and fiscal decentralisation reforms. To a large extent, such reforms have been strengthened by the argument that the decentralised organisation of government brings about welfare-enhancing

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results and makes government activities more accountable. While the stabilisation and the redistribution function of government are more efficient on the central level, resource allocation efficiency can be improved if sub-national governments are given discretion to govern their own revenues and expenditures. It has been argued that sub-national governments are closer and more responsive to the needs and preferences of local residents, and that this allows a closer match between the preferences of the population and the bundle of public goods and services chosen by government – assuming that preferences are heterogeneous across different sub-national units. Consequently, sub-national tiers of government emerged as important players in the field of public finances. However, recent data on sub-national governments' tax autonomy suggest that only a small number of countries are genuinely decentralised. Many countries have an “incomplete” form of decentralisation that involves only the transfer of expenditure responsibilities to sub-national governments, without the corresponding transfer of revenue responsibilities. However, by definition, fiscal decentralisation goes beyond the assignment of expenditure responsibilities to sub-national governments. As pointed out by Stein (1999), a crucial dimension of decentralisation is how the provision of these services is financed. Because of this widespread divergence between the sub-national responsibilities for expenditures and revenues, decentralised countries often end up having a large degree of vertical fiscal imbalance. Vertical fiscal imbalances are mostly bridged through governmental transfers from the central government, many of which are discretionary in nature. This practice may reduce the fiscal discipline of sub-national governments and result in a common pool problem. As long as central government is willing to tolerate and, more importantly, bail out fiscally irresponsible sub-national governments, there will be no incentive for sub-governmental fiscal discipline, which is at the heart of fiscal decentralisation.

While most authors agree that fiscal decentralisation brings about efficiency gains in the provision of public goods and services, there is no theoretical (or empirical) consensus on its impact on the total size of government.

In this paper we shed some light on this issue by providing a thorough survey of the empirical literature on fiscal decentralisation and the size of government. In section two, we discuss different transmission channels through which decentralisation is expected to affect the size of government. We start with the classical supply-side hypothesis; namely, the Leviathan hypothesis, but we also discuss the possibility that decentralisation changes the demand for public goods and services. In section three, we review the relevant empirical literature. In the final section, we conclude, discussing some open questions.

2 The effects of fiscal decentralisation on the size of government: theoretical considerations

For good or ill, fiscal decentralisation is commonly thought to restrict the growth of government spending (Rodden, 2003). This stylised fact about the relationship between fiscal decentralisation and the size of government is articulated in the influential work by Brennan and Buchanan (1980). They depict government as a monolithic Leviathan, which seeks to maximise revenues and increase its dimensions, through excessive rates of taxation, debt or money creation. Greater centralisation, i.e. “monopolisation” of government,

accompanied by a weak intergovernmental competition, is argued to lead to a larger government size in the economy. The rationale behind this argument is that the centralised/monopolistic government's position makes it easier for government to disguise and promote its selfish interests, while "deceived" taxpayers/voters have little control over such large and distant government. According to Brennan and Buchanan (1980) there are two ways to constrain the Leviathan. One way includes constitutional constraints through balanced-budget provision and limitation of government access to tax and other fiscal instruments. Another way is decentralisation of government's spending and taxing powers. Assuming that firms and citizens are mobile across jurisdictions, any attempt by one sub-national unit to raise the "tax price" will result in a migration of its economic resources to an alternative sub-national unit. Because of this competitive pressure, each sub-national unit will aim at reducing the "tax price" and in consequence, given the balanced-budget proposition, the supply of sub-national public goods and services. In the worst case scenario, this may result in a worrisome "race to the bottom" and, consequently, under-provision of certain public goods and services. In the Brennan and Buchanan (1980) model, revenue generation is assumed to be independent of the demand for publicly provided goods and services. In other words, the presumption of government benevolence is dropped (Nelson, 1986), and the observed level of government expenditure in the economy is determined by the supply of government expenditures.

The original Leviathan hypothesis – "total government intrusion into the economy should be smaller, *ceteris paribus*, the greater the extent to which taxes and expenditures are decentralised" (Brennan and Buchanan, 1980) – assumes the inseparability of tax and expenditure decentralisation. However, there are very few countries in the world that are genuinely decentralised, i.e. countries in which citizens are represented at each level of government and their representatives can decide on both the expenditures and taxes at each respective level (Muller, 2003). Switzerland seems to be the only European country where citizens have direct influence on both expenditures and taxes at each level of government (Feld, Kirchgassner and Schaltegger, 2003). In reality, even those countries that are mostly praised for being federalist cannot be credited for having absolutely limited central and self-financing sub-national governments. Instead, regional and local governments collude with central governments and their expenditures get funded primarily by intergovernmental grants, revenue-sharing programs, or other centrally controlled funds. This type of decentralisation, that is, expenditure decentralisation without corresponding tax decentralisation, is not expected to provoke the tax competition that drives the Leviathan model. Moreover, it might have the entirely opposite effect on the size of government (Rodden, 2003). The revenue sharing schemes reduce the competitive pressure and result in concentration of taxing power in the hands of the revenue-maximising national governments (Ehdaie, 1994). It blurs the responsibility for spending decisions by dispersing it among a potentially large number of different levels of government and makes consumers-voters less confident about their true tax burden. It can add to the problem of the common pool, i.e. make it more likely for sub-central governments to impose the political and economic costs of their spending decisions on residents outside their jurisdictions. To an extent, sub-national governments, aiming to maximise their own share of the "common revenue pie", may face an incentive to overfish and, as pointed by Fiva (2006), to

push for higher taxes at the central level, which in turn yields expenditures with sub-nationally concentrated benefits. This means that sub-national governments would behave as interest groups and would engage in “competition” for intergovernmental grants, rather than in competition for mobile tax bases, as assumed by the Leviathan hypothesis. Hence, decentralisation funded by intergovernmental grants from the common revenue pool, for a given extent of tax revenue decentralisation, could be associated with higher overall government spending.

Apart from the supply-side explanation for the effect of fiscal decentralisation on the size of government, in the absence of a formal structural model of the size of government in the economy, a demand-side explanation can be easily motivated: within the conventional median-voter model we can assume that government is a benevolent social-welfare maximiser, so that the supply of government expenditures is perfectly elastic, while the demand for government expenditures determines the observed level of government expenditures in the economy. From this demand-side perspective we can envisage two opposite effects of fiscal decentralisation on the total size of government. Because fiscal decentralisation brings about competition among sub-national governments and results in more transparent decentralised budgets, it reduces the fiscal illusion of some consumers-voters making them more aware of their true tax burden. In a genuinely decentralised structure of governance, consumers-voters in adjacent jurisdictions can relatively easily compare their relative positions and penalize their sub-national government for excessive and wasteful spending. To minimise the probability of not being re-elected, sub-national governments may want to indulge their consumers-voters and reduce the size of expenditures. Consequently, we would expect government share in the economy to vary inversely with the extent of fiscal decentralization. However, alternative mechanisms may give the opposite results. As already pointed out, fiscal decentralisation may increase the efficiency and quality of government services by tailoring them more consistently to the needs of consumer-voters. It may be argued that greater decentralisation enhances citizens’ trust in government, which allows them to demand more public goods and services, hence leading to a greater size of government. Additionally, many tiers of government imply more access points and politicians willing to answer to special interest groups demanding more government expenditures. The more decentralised political power is, the greater the potential for interest group influence there is and the greater the number of interest groups there will be. Given these different possible channels of influence, it is not quite certain what differences in the size of government might be caused by more decentralisation.

3 Review of the empirical literature

The ongoing intensive empirical “search” for the Leviathan was initiated by Oates’s (1985) seminal paper. After it was published, this study was replicated by many authors, using different proxies for the variables of interest, different data sets – countries and time periods and different estimation techniques. In what follows, we give an overview of empirical studies that investigate the relationship between the degree of decentralisation and the size of government. This topic started to preoccupy economists’ minds long time ago and has resulted in a large number of empirical studies. We would by no means claim that

this is a fully comprehensive list of studies, but we believe that the cited studies are among the most relevant (Table 1 in Appendix).

In the pioneering study, Oates (1985) failed to find the Leviathan in the sample of the 48 US contiguous states as well as in the sample of 43 developed and developing countries. Within the US, Oates (1985) tests for the significance of the effect of decentralisation on the state government level, while in the cross-country analysis he focuses on the total general government level. In both cases, none of the (de)centralisation variables used exerted a statistically significant effect that would lend support to the Leviathan hypothesis. Employing rather similar measures of government size and decentralisation, Nelson (1986) also finds no evidence in support of the Leviathan hypothesis for the state governments in the US. He does provide, however, some evidence that a greater number of relatively homogeneous sub-state governmental units exert a constraining effect on the level of state revenues. As a note, we point to the measure of government size used in Oates (1985) and Nelson (1986) and potential problems related to it. Namely, the relative size of government in both studies is measured in terms of tax receipts. Although there is no single best measure that would reflect all the activities undertaken by the government, the majority of the studies in this field use the share of government expenditures (rather than tax receipts or revenues) in the total economy. It could be argued that measures of government size defined in terms of total expenditures reflect a more complete and meaningful measure of total resources absorption by government than those using revenue-based measure. Namely, total government expenditures can be financed from several sources – directly and/or indirectly, through money creation, inflation, debt. While Oates (1985), Nelson (1986), Forbes and Zampelli (1989), Feld, Kirchgässner and Schaltegger (2003), and Prohl and Schneider (2009) use revenue-based measures of government size, all other studies reviewed in this paper employ the expenditure-based measure for the construction of dependent variable. A noticeable exception is Martinez-Vazquez and Yao (2009) where the size of government is measured by the number of public sector employees – this is a somewhat different, but not unusual practice within the government sector literature.

An empirical proof of the Leviathan hypothesis, i.e. a negative statistically significant relationship between decentralisation and the size of government, is found in Marlow (1988). The main difference between Marlow (1988) and the two previous studies is the level of analysis. Whereas Oates (1985) and Nelson (1986) investigate the behaviour of the state government level – measured by state and local tax revenues as a share of personal income/per capita – in response to changes in the degree of decentralisation, Marlow (1988) focuses on the total general government size – the sum of state, local and federal government expenditure as a percentage of GNP – as a measure that better suits the wording “total government intrusion” in the Leviathan hypothesis (Marlow, 1988). Using data on aggregate US government expenditures from 1946 to 1985, he shows that increased levels of fiscal decentralization – measured as state and local government spending relative to total government spending – lead to a smaller government size. Using the same sample, Grossman (1989) confirms Marlow’s results. In the decentralisation – government size relationship, Grossman (1989) emphasises the role of intergovernmental grants, which are supposed to encourage expansion of government size by concentrating taxing power in the national government and by weakening the fiscal discipline imposed

on sub-national governments for the financing of their own expenditures. He empirically confirms that vertical fiscal imbalance – measured by the share of federal grants to state and local governments in total state and local receipts – increases the size of government, measured by the total government expenditures relative to GNP. To summarise, Grossman's (1989) results do support the Leviathan hypothesis and explicitly point to government size-enhancing effect of intergovernmental transfers. Shadbegian (1999) builds on Marlow (1988) and Grossman (1989), but in addition to the general government level, he extends the analysis to include the federal government and the state government levels. He shows that, as suggested by the Leviathan hypothesis, fiscal decentralization – measured by state and local government own-purpose expenditure relative to total government expenditures – causes decreased expenditure by total and federal governments. At the same time, as fiscal decentralization increases, state and local public expenditures increase, but this increase is more than offset by the decrease in federal government expenditures, hence total general government decreases as a reaction to fiscal decentralisation. Shadbegian (1999) also shows that intergovernmental transfers lead to an increase in overall government expenditures and an increase in expenditures at each individual level of government, confirming that collusion among the different levels of government weakens the disciplining power of fiscal federalism. Contrary to the studies that argue in favour of a more aggregate level of analysis, Forbes and Zampelli (1989) explain that the county level of government provides the most reasonable setting for examining the Leviathan hypothesis since citizen mobility, as an important prerequisite for inter-jurisdictional competition, should be evident at a relatively local level. They estimate a single equation model using data for 345 counties in 157 Standard Metropolitan Statistical Areas (SMSAs) to test the hypothesis that county government (own) revenues (per capita/per personal income) should be lower in those metropolitan areas with a larger number of competing county governments. The results, pretty much in line with Oates (1985) and Nelson (1986), suggest that at the county level of government, Leviathan is a “mythical” beast. Joulfaian and Marlow (1990, 1991) are critical of all cross-sectional studies of the decentralization hypothesis that fail to include the federal sector in the measure of the size of government. Thus, in their studies on the American states, Joulfaian and Marlow (1990, 1991) measure government size by including disaggregated federal government expenditures on a state-by-state basis. The main finding is that the size of government and the level of decentralization are inversely related, as predicted by the Leviathan hypothesis.

The US government finance data have been widely exploited for the intra-national analysis of the relationship between fiscal decentralisation and the size of government in the US. Other intra-national studies, such as Grossman and West (1994) and Feld, Kirchgässner and Schaltegger (2003), search for the Leviathan in Canada and Switzerland. Feld, Kirchgässner and Schaltegger (2003) investigate different channels of influence of fiscal federalism on the size and structure of revenues of Swiss cantons using the data for 26 Swiss cantons from 1980 to 1998. They find that fiscal decentralization – measured by the share of local in cantonal and state government revenues – has a statistically significant negative effect on the size of cantons – measured by the cantonal and local government revenues per capita. This revenue-reducing effect of fiscal decentralization, as argued by Feld, Kirchgässner and Schaltegger (2003), originates primarily from the consid-

erable tax autonomy and tax power granted to the cantons by the constitution and supports the Leviathan hypothesis. Building on Shadbegian (1999), Grossman and West (1994) employ Canadian time series data on general, federal, provincial, and local government expenditures and find evidence in support of the Leviathan hypothesis for total and federal government, but not for the provincial level of government. Moreover, they find evidence that collusion among separate governmental units – measured as the level of inter-governmental grants from higher level to lower level governments – increases the size of each level of government, thereby suggesting that it can weaken the discipline of fiscal federalism.

The evidence from the cited intra-national studies of the relationship between fiscal decentralisation and government size – in particular, for American states, Swiss cantons and Canadian provinces – is rather mixed and inconclusive. Unfortunately, it seems that also cross-country studies do not shed much light.

Ehdaie (1994) tests the Leviathan hypothesis using international cross-country data, divided into two samples – sample 1 consists of 30 countries in 1987, while sample 2 counts 26 countries in 1977. To ensure that the measure of fiscal decentralisation used in his study accounts for the simultaneous decentralisation of the national government's taxing and spending powers to sub-national governments, Ehdaie (1994) employs the GFS's ratio of sub-national governments' own-source revenues to total government expenditures. However, for the reasons explained in the subsequent sections, this measure does not satisfactorily reflect the inseparability of revenue-raising and spending responsibilities at the sub-national level of government. To control for the level of collusion among governmental units, he includes the ratio of the central government's revenues transferred to sub-national governments over total government expenditures. Failing to control for the collusion, he argues, would lead to biased estimates for decentralization, and consequently to confounded conclusions and policy recommendations, particularly in countries where intergovernmental transfers compose a large portion of sub-national budget. Hence, drawing on Grossman (1989), Ehdaie (1994) explicitly explores Brennan and Buchanan's (1980) caveat that the possibility of collusion among different units of governments should be included among "other things equal". Findings of this study lend support to the Leviathan hypothesis since the coefficient on the decentralisation variable proves to be statistically significant and negative. In line with a priori expectations, fiscal collusion has the opposite, albeit statistically insignificant effect. The effect of collusion is thoroughly examined in Stein (1999) on Latin American cross-country data, averaged for the 1990-1995 period. The problem of vertical fiscal imbalance, which is typically bridged through the use of transfers from the central government, may weaken the budget constraints of the sub-national governments, unless, as pointed by Stein (1999), these intergovernmental transfers are very strictly defined, with resources allocated according to objective criteria and with little room for discretionality and bargaining between the different levels of government. If such conditions are not satisfied, sub-national governments may have an incentive to over-borrow and over-spend, and then shift the burden onto the central government and other governmental units. Consequently, in the empirical model, Stein (1999) uses different decentralisation variables – either expenditure decentralisation or the interactive variables: the product of expenditure decentralisation and vertical imbalance, the

product of expenditure decentralisation, vertical imbalance and sub-national governments' borrowing autonomy, the product of expenditure decentralisation, vertical imbalance and discretionality in transfers. Not only do Stein's results (1999) indicate that decentralised governments tend to be larger, but also, quite expectedly, that the size of government depends on the form of decentralisation – arrangements more likely to lead to soft budget constraints seem to be associated with larger size. Jin and Zou (2002) examine how different levels of government – general, national and sub-national – behave in response to expenditure decentralisation, revenue decentralisation and vertical fiscal imbalance, using the panel of 32 developed and developing countries over the period 1980-1994. Broadly, the main results suggest that expenditure decentralization leads to smaller national governments, larger sub-national governments, and larger total general governments. Revenue decentralization, on the other hand, increases sub-national governments by less than it reduces national governments, hence leads to smaller aggregate governments. Finally, vertical imbalance tends to increase the size of total, as well as of national and sub-national, governments.

The standard source of data on revenue and expenditure shares for sub-national relative to total government is the IMF's Government Finance Statistics (GFS). To a large extent, this is because until recently it has been the only official source of this type of data. However, despite being consistent and operational, as pointed by Fiva (2006), this data set fails to address properly the intergovernmental fiscal structure of countries. Although the GFS database keeps track of certain types of grants and various forms of own source sub-national revenue, it fails to distinguish between tax revenues that are legislated and collected locally from those that accrue to the sub-national governments automatically through revenue-sharing schemes (Rodden, 2003). Consequently, it tends to overestimate sub-national revenue autonomy. It is also likely to overestimate the true nature of spending autonomy, since the figures on sub-national expenditures also include those expenditures that are funded by intergovernmental grants, mandated by the central government or spent on behalf of the central government. A country may formally allocate a large part of the national government budget to the sub-national level, but this does not necessarily mean that sub-national governments are granted autonomy over decisions regarding those expenditures and revenues. Consequently, the estimators and findings of the studies employing this dataset might be misleading, since intergovernmental grants or some other revenue sharing arrangements between sub-central and central governments are not explicitly accounted for. Aiming to cope with this deficiency, OECD researchers are making an effort to refine the measure of revenue decentralisation by classifying taxes in terms of the degree of autonomy they provide to sub-national governments. Stegarescu (2005) goes a step further – he draws on the OECD's analytical framework and expands the data set to cover 23 OECD countries from 1965 to 2001. He distinguishes between different types of sub-national government revenues according to the degree of discretion sub-national governments are granted in determining them autonomously. As pointed out by Stegarescu (2005), a system where sub-national levels of government have real autonomy to determine the allocation of their expenditures or to raise their own revenue is more decentralised than a different system in which sub-national government expenditures and

revenues are determined by national legislation, even though the formal assignment of functions or revenues might be the same.

Rodden (2003) uses both the GFS and the OECD improved data set to demonstrate that the effect of decentralisation on government size is conditioned by the nature of fiscal federalism. Most interestingly, his preliminary examination of the OECD's ratio of revenue from own taxes that are actually controlled by sub-national governments to total sub-national revenue indicates that full tax decentralisation is more unusual than is commonly thought. Results from a somewhat limited data set consisting of 1985-1995 averages for 19 OECD countries suggest that decentralisation, when funded primarily by autonomous local taxation, is associated with smaller government. On the other hand, when funded by revenue sharing, grants, or centrally regulated sub-national taxation, fiscal decentralisation is associated with larger government. In the same study, Rodden (2003) extends the number of countries to a sample of 44 countries for the period 1978-1997, but at the expense of employing less satisfactory GFS data on fiscal decentralisation. The results obtained using this particular data set and data source, also indicated that decentralisation funded by direct intergovernmental transfers is associated with larger government. It seems that when central governments increase transfers to sub-national governments, they do not reduce their own direct expenditures, while sub-national governments spend all they receive through increased transfers. Fiva (2006) employs the Stegarescu (2005) "purified" measure of revenue decentralisation; that is, the share of sub-national government autonomous own revenues – only those where the sub-national government has discretion over tax rate, tax base or both – in total general government revenues. From a cross-country perspective, the findings in Fiva (2006) suggest that tax decentralisation is associated with a smaller government sector, lending support to the Leviathan hypothesis. Expenditure decentralisation, on the other hand, is associated with a larger government sector. Prohl and Schneider (2009) study the effect of decentralization on the growth of government size for a panel of 29 countries over the 1978-2003 period. They employ two different proxy variables of fiscal decentralization – the "classical" GFS measure of expenditure and revenue decentralisation and their own index of fiscal federalism. Their index of fiscal federalism incorporates the fiscal and administrative autonomy that constitutional and statutory law grants to sub-national governments. It varies from zero (for low fiscal autonomy) to six (for high fiscal autonomy) and is highly correlated with the degree of expenditure and revenue decentralization as measured by the GFS data. The results indicate that the growth of government, measured either by the share of government expenditures or revenues in GDP, is inversely influenced by each of the decentralisation variables – the GFS's expenditure and revenue sub-national government shares and the Prohl and Schneider (2009) index of fiscal federalism.

Although still heterogeneous, the results of the cross-country studies seem to offer more empirical support for the Leviathan hypothesis than the intra-national studies. It is possible that a part of this discrepancy is due to differences in the design of the studies themselves and econometric techniques used. While the intra-national studies mainly employ single-year snapshots, cross-section averages or single-country time-series data, in the cross-national studies authors in general take advantage of both cross-section and time-series dimension of the data at hand. Mostly, they use panel data analysis techniques and

estimators that are, unlike the classical ordinary least squares (OLS) estimator, robust to some of the specification problems frequently encountered in this kind of analysis. Given the dynamic nature of both fiscal decentralisation and government size, the better analysis of dynamic adjustment that panel data allow (Kennedy, 2008) is certainly one of the most important advantages of this type of data. However, since modelling dynamics typically involves including a lagged dependent variable as an explanatory variable, unless the time-series dimension of the data set is very large, pooled OLS, fixed-effect (FE) and random-effects (RE) estimators are biased. Additionally, the problem of a reverse causation in the relationship between fiscal decentralisation and government size as another source of endogeneity seems to be avoided by the authors, either by being neglected completely or only mentioned in passing. Among the reviewed studies, Rodden (2003), Feld, Kirchgässner and Schaltegger (2003) and Martinez-Vazquez and Yao (2009) address this problem more explicitly. In order to tackle the problem of possible endogeneity of the decentralization variable, Feld, Kirchgässner and Schaltegger (2003) and Martinez-Vazquez and Yao (2009) use the two-stage least square (2SLS) procedure. As suitable instrumental variables – uncorrelated with the error term and correlated with the potentially endogenous decentralisation variable – Feld, Kirchgässner and Schaltegger (2003) use lags of the original decentralization variable, while Martinez-Vazquez and Yao (2009) use ethnic, language and religion fractionalisation indices. Rodden (2003) uses several different estimators, including the Arellano-Bond generalised method of moments (GMM), where internal instruments for the potentially endogenous variables are created and used.

We have already pointed out the insufficient attention that has been given to different forms of fiscal decentralisation in empirical studies. This may add to the explanation of the heterogeneity of empirical results. The majority of the intra-national as well as a large part of cross-country studies measure decentralisation by the fraction of sub-national expenditures (or revenues) from total government expenditures (or revenues). However, it might make a difference for the estimation results if an author uses a revenue or expenditure measure of the extent of decentralisation. Moreover, it might make a difference if an author uses own-source revenue or an aggregate accounting revenue measure. If decentralisation is to have a constraining effect on the size of government it must occur on both the expenditure and the revenue side (Rodden, 2003). Hence, a reliable measure of fiscal decentralisation needs to effectively quantify the activities of sub-central governments arising from their full autonomous decisions (Fiva, 2005). The non-existence of such a measure partly justifies this malpractice by some authors, particularly by those who were among the first to explore this topic empirically. Efforts put in by OECD researchers and authors such as Stegarescu (2005) and Prohl and Schneider (2009), enable replication and a more precise re-estimation of the relationship between fiscal decentralisation and government size, with a measure of fiscal decentralisation that better reflects its theoretical counterpart.

In the absence of a fully specified model of the size of government in the economy, researchers typically estimate reduced-form equations using explanatory variables that other studies have found to be of significance in explaining the size of the government sector. The standard approach is to regress some measure of government size on some measure of fiscal decentralisation and a set of control variables, such as income, population, a country's openness, the age dependency ratio, unemployment rate, and some po-

litical variables that are a priori expected to have an effect on the total size of government in the economy.

4 Conclusion

An argument supportive of decentralisation is that it increases allocative efficiency since sub-national governments, which are closer and more responsive to the needs and preferences of local residents, are given discretion to govern their own affairs. It has also been argued that a decentralised provision and financing of public services induces competitive pressure among different governmental units, consequently reducing inefficiency and waste in the public sector and the total size of tax burden and government expenditures. In this light, transitional economies are regularly advised to pursue decentralised organisation of government activities as a means to reduce the overall size of government and stimulate development of their economies. Nonetheless, economists are still struggling to give a clear-cut theoretical explanation of the effect of decentralisation on the size of government, and the empirical results are mixed.

Until recently, studies that examined the relationship between fiscal decentralisation and the size of government typically employed accounting measures of either revenue or spending shares for sub-national relative to general government as a proxy for fiscal decentralisation, irrespective of whether sub-national governments actually have discretion over those assigned functions or revenues. Since fiscal decentralisation seems to have occurred almost exclusively through increased grants and shared revenues rather than the devolution of expenditure and tax authority in the majority of countries (Rodden, 2003), those two measures do not capture accurately the phenomenon of fiscal decentralisation. It is only recent studies, such as Ehdaie (1994), Stein (1999), Jin and Zou (2002), Rodden (2003), Stegarescu (2005), Fiva (2006), Prohl and Schneider (2009), that take the distinction between spending decentralisation, revenue decentralisation and intergovernmental grants seriously. In general, these studies point out the asymmetric effect of the two measures of decentralisation – expenditure decentralisation is found to increase the total size of government, while own-source revenue decentralisation has the opposite effect. This dichotomy of effects suggests that decentralisation has to include both the expenditure-based and the revenue-based activities of the sub-national governments to have a constraining effect on the total size of government in the economy. If not, a common pool problem may arise. It may reduce the competitive pressure on sub-national governments for mobile economic resources, while leaving the total effect of fiscal decentralisation on the size of government indecisive a priori.

All in all, in the empirical literature, little consensus has emerged on the effect of fiscal decentralisation and the size of government. Hence, as a concluding remark, we cite an observation by Rodden (2003) – “those who are alarmed that the global trend toward fiscal decentralisation entails dangerous tax competition have little to fear, and those who envision smaller, more efficient government have little to celebrate”.

Appendix
Table 1

Study	Data sample (countries, time period)	Estimation technique, estimator	Measure of decentralisation	Measure of government size	Main finding(s)	Level of analysis, unit of observation
Oates (1985)	43 countries, 1982 48 contiguous USA states, 1977	Cross-section, OLS	Central government revenues/expenditures as a share of total government revenues/expenditures State government revenues/expenditures as a share of state and local government revenues/expenditures The absolute number of local government units in a state	Total government revenues as a share of GDP State and local tax revenues as a share of personal income	No support for the LH National: State government	Cross-country: General government National: State government
Nelson (1986)	49 USA states, the 1976/77 fiscal year	Cross-section, OLS	State government tax revenues as a share of total state and local tax revenues The 1975 population of the state divided by the number of counties within the state	State and local government tax revenues per capita/per state personal income	No support for the LH – revenue decentralisation	National: State government
Marlow (1988)	USA, 1946-1985	Time-series, OLS	State and local government expenditures as a share of total government expenditures	Total government expenditures as a share of GNP	Support for the LH	National: General government
Forbes and Zampelli (1989)	157 USA SMSAs (345 counties), 1977	Cross-section, OLS, ML	Total number of county governments in a SMSA	County government revenue per capita/per personal income County government own revenue per capita/per personal income	No support for the LH	National: State government SMSA

Grossman (1989)	USA, 1946-1986	Time-series, OLS	State and local government expenditures as a share of total government expenditures	Total government expenditures as a share of GNP	Support for the LH	National: General government
Jouffaian and Marlow (1990)	48 USA states, 1981 and 1984	Cross-section, OLS	State and local government expenditures as a share in total government expenditures Number of state and local government units for each state in 1982	Total government expenditures (federal net of grants + state + local) as a share of gross state product for each state	Support for the LH	National: State government
Jouffaian and Marlow (1991)	48 USA states, 1983, 1984 and 1985	Cross-section, OLS	State and local government expenditures as a share of total government expenditures Local government expenditures as a share of state and local government expenditures Number of local governments in SMSA	Total government expenditures as a share of gross state product/per capita	Support for the LH – total government expenditures	National: General government, State government
Ehdaie (1994)	Sample I: 30 countries, 1987 Sample II: 26 countries, 1977-1987	Cross-section, OLS	Sub-national governments own-source revenues as a share of total government expenditures	Total government expenditures as a share of GDP	Support for the LH	Cross-country: General government
Grossman and West (1994)	Canada, 1958-1987	Time-series, OLS	Provincial and local government own-purpose expenditures as a share of total government expenditures	Total/federal/provincial and local expenditures as a share of GNP	Support for the LH – total and federal government	National: General, federal, provincial and local

Study	Data sample (countries, time period)	Estimation technique, estimator	Measure of decentralisation	Measure of government size	Main finding(s)	Level of analysis, unit of observation
Shadbeigian (1999)	48 USA states, 1979-1992	Panel data, GLS, FE	State and local government own-purpose expenditures as a share of total government expenditures	Local/state/state and local/federal/total government own-purpose expenditures as a share of gross state product	Support for the LH – total and federal government	National: General government, Federal government, State government
Stein (1999)	Latin America (and the OECD countries), average 1990-1995	Cross-section, OLS	Sub-national government expenditures as a share of total government expenditures	Total government expenditures as a share of GDP	No support for the LH	Cross-country: General government
Jin and Zou (2002)	17 developed and 15 developing countries, 1980-1994	Panel data, FE, FGLS	Sub-national government expenditures as a share of total government expenditures Sub-national government own-source revenue as a share of total government revenue	Sub-national/central/total government expenditures as a share of GDP	Support for the LH – revenue decentralisation	Cross-country: General government, Central governments and Sub-national governments
Feld, Kirchgässner and Schaltegger (2003)	26 Swiss cantons, 1980-1998	Pooled cross-section time-series OLS, 2SLS	Local government revenue as a share of state and local government revenue Total number of communes in a canton per capita	Cantonal and local government revenue (income, property, profit and capital tax as well as user charges) per capita	Support for the LH – revenue decentralisation	National: State government
Rodden (2003)	Dataset I: 44 countries, 1978-1997; subsample: 25 countries, 1980-1993	Panel data, error-correction model, FE, Arellano-Bond's GMM,	Sub-national government own-source revenue as a share of total government revenue (GFS)	Total government expenditures as a share of GDP	Support for the LH – revenue decentralisation	Cross-country: General government (supplementary analysis on central and

	Dataset II: 19 OECD countries, average 1985-1995	"between effects" OLS	Sub-national government own-source revenue as a share of total government revenue (OECD)			sub-national level of government)
Fiva (2006)	18 OECD countries, 1970-2000, 5-year averages	Panel data, pooled cross-section time-series OLS, fixed-effects	Sub-national governments revenue as a share of general government revenue (Stegarescu, 2005) Sub-national expenditures as a share of general government expenditures	Total government expenditures as a share of GDP	Support for the LH – revenue decentralisation	Cross-country: General government
Martinez-Vazquez and Yao (2009)	74 countries, 1985-2005 (various years)	Panel data, 2SLS	Sub-national expenditures/revenues as a share of general government expenditures/revenues	Public sector employees as a share of population/labour force General government employees as a share of population	No support for the LH	Cross-country: Public sector employment, general government employment
Prohl and Schneider (2009)	29 countries, 1978-2003	Panel data, pooled cross-sectional time-series, GLS	Sub-national government expenditures/revenues as a share of general government expenditures/revenues The Prohl and Schneider (2009) fiscal federalism index	Total government expenditures/revenue as a share of GDP	Support for the LH	Cross-country: General government

Notes: LH = Leviathan Hypothesis, GDP = gross domestic product, SMSA = standard metropolitan statistical area, ML = maximum likelihood, GLS = generalised least squares, FE = fixed effects, OLS = ordinary least squares, 2SLS = two-stage least squares, FGLS = feasible generalized least squares, GMM = generalised method of moments, GFS = Government Finance Statistics, OECD = Organisation for Economic Co-operation and Development.

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