Can fiscal decentralization alleviate government consumption volatility?

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The asymmetric nature of fiscal decentralization: theory and practice[(*)]

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Abstract

A relevant mismatch between tax and expenditure decentralization characterizes many industrialized countries. The former is usually less pronounced than the latter, resulting in asymmetric fiscal decentralization arrangements. We investigate the nature of this asymmetry using a theoretical framework that explains why it is difficult to tackle it, despite a consensus on the benefits of a well-balanced decentralization process. We find that asymmetry is intrinsic to fiscal decentralization, even in a scenario where clear advantages from well-developed decentralized systems arise. This implies that both empirical and theoretical contributions would benefit by taking into account the welfare-reducing asymmetric nature of fiscal decentralization.

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1. Introduction

The recent decades have witnessed a significant increase in the degree of fiscal decentralization in many countries (OECD 2006, 2009a; Bodman and Hodge 2010). These reforms have promoted the autonomy and responsibility of sub-central governments with the aim of improving the efficiency in the allocation of public resources (Stigler 1957; Musgrave 1959; Oates 1972).[1] However, there is evidence of a widespread mismatch between expenditure and tax decentralization. "While both revenue and spending became more decentralized over the past twenty years, spending decentralization clearly outpaced revenue decentralization, resulting in a higher vertical fiscal imbalance and growing intergovernmental grants" (OECD 2102, p. 4).

Most recent fiscal federalism reforms in OECD countries have considerably changed sub-central fiscal policy especially on the spending and transfer side, with considerably less intervention on intergovernmental tax systems. While new responsibilities for the provision of public services have been assigned to the sub-central level, intergovernmental grant systems have been updated without tackling the asymmetry between the expenditure and the revenue side (see Blöchliger and Vammalle 2012 for further details). As a result, local governments[2] cannot exert a full degree of autonomy over their different types of revenues (own taxes, piggybacked and shared taxes, and grants) to finance their expenditures.

Not only has this worked against the benefit principle of taxation ensuring adequate coverage of the expenditures (Musgrave 1983; King 1984), but it has been observed that "a higher sub-central government tax share could increase efficiency and accountability" (OECD 2009b, p. 5). Similar prescriptions are envisaged by Mc-Lure and Martinez-Vazquez (2000) according to whom a stable and meaningful decentralization process requires a well-defined institutional framework in the assignment of expenditure responsibilities combined with a sufficient budgetary autonomy to carry out the assigned tasks at each government level. Shah (1998) also points out that governments at all levels should bear the financial burden of their decisions.

However, the fiscal federalism literature does not add much to these guidelines, and typically assumes that lower levels of government both collect taxes and spend funds, resulting in sub-central authorities classified either as low-tax–low-services or high-tax–high-services (Bardhan 2002). Given the existing decentralization arrangements, these assumptions appear to be particularly problematic. For example, accountability is normally perceived to be a welfare-enhancing feature of decentralization (Tommasi and Weinschelbaum 2007), but it can only be obtained by making local governments responsible for financing their expenditures, *i.e.* by adopting a balanced decentralization structure. This arises from the works by Rodden (2003), Jack (2004), and Rodríguez-Pose *et al.* (2009) who affirm that the effectiveness of fiscal decentralization depends on expenditure

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[1] Although there is a sort of consensus on the benefits in terms of efficiency related to decentralization, there are authors claiming that decentralization does not necessarily imply more efficiency, especially if expenditure and tax decentralization decisions are not taken at the same time (Lundholm 2008).

[2] We use 'local' as a synonym of 'sub-central' throughout the paper.

decentralization being accompanied by decentralization of revenue powers, rather than being funded through revenue sharing and intergovernmental grant schemes.

Related to that, a number of authors have recently started to investigate the different implications of revenue versus expenditure decentralization in relation to GDP growth (*e.g.*, Jin and Zou 2005; Gemmell *et al.* 2013), fiscal discipline (*e.g.*, Afonso and Hauptmeier 2009; Escolano *et al.* 2012), or income distribution (Boadway *et al.* 2003; Sacchi and Salotti 2013). As expected, this has resulted in different empirical findings depending on the series used to measure fiscal decentralization, *i.e.* either expenditure or revenue decentralization.[3]

It could be argued that the different effects of expenditure decentralization with respect to those of revenue decentralization may be due to the difference between the two, *i.e.* to their asymmetry. For example, Blöchlinger and Égert (2013) study the impact of decentralization on economic growth and conclude that the revenue-based decentralization indicators deliver results both statistically and economically more significant than spending-based indicators. This may be due to the reduction in the asymmetry achieved with higher revenue decentralization, rather than being due to a larger impact of revenue decentralization *per se*. Similarly, Gemmell *et al.* (2013) find that spending decentralization is associated with lower economic growth, while revenue decentralization with higher growth. Since OECD countries are substantially more spending than revenue decentralized, this result suggests that reducing expenditure decentralization and increasing tax decentralization would be growth-enhancing. Again, this may be interpreted as a beneficial effect related to the reduction of the decentralization asymmetry. This would also be consistent with Oates' (1972) hypothesis that a close match between spending assignments and revenue discretion at sub-national levels maximizes the efficiency gains of decentralization.

Despite the prominence of this theoretical recommendation, the literature has not devoted much attention to the implications of the asymmetric nature of fiscal decentralization and the reasons behind the non-alignment of expenditure and tax decentralization remain to be studied. Most authors prefer to concentrate on the distinction between political and fiscal decentralization (*e.g.*, Bosch and Durán 2008), and on the consequences of the effective degree of autonomy granted to local governments (*e.g.*, Thornton 2007).

We aim at achieving a better comprehension of the fiscal mismatch characterizing the sub-central tiers of government of most industrialized countries by studying the link between the local tax assignment issue (Liberati 2011) and the expenditure task problem (OECD 2009c). We firstly use some data to illustrate the fiscal imbalance mentioned above. The lack of corrective actions documented by recent studies (OECD 2012) emerges from the simple descriptive statistics that we present. Then, we set up a theoretical framework with advantages assigned to well-balanced

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[3] This means that studies using parsimonious ways to measure the degree of decentralization may end up blurring the different implications of decentralizing the two sides of the budget (Akai and Sakata 2002, Thieben 2003), or may see their results spoiled by potential measurement issues or because they overestimate the extent of autonomy given to local governments..

decentralization, *i.e.* with strong linkages between spending and taxation decisions at the local level. We find that even in a scenario favorable to symmetrical fiscal decentralization, the expenditure/revenue mismatch emerges as one of its unavoidable features. This yields interesting implications for both the empirical and theoretical analyses dealing with fiscal decentralization, as neglecting this asymmetric nature may lead to misleading outcomes and conclusions due to the omission of the important consequences that it may have on welfare, fiscal discipline, and GDP growth.

The remainder of the paper is organized as follows. Section 2 illustrates some facts on the differences between tax and expenditure decentralization in advanced economies. Section 3 develops the theoretical framework analyzing the nature of the asymmetry. Section 4 concludes.

2. Stylized facts

Existing data (which are mostly available for OECD economies since 1972) confirm that a number of countries are characterized by an asymmetric mix of expenditure and tax decentralization, with the latter relatively more centralized than the former (Dziobek et al. 2011). Figure 1 confirms this trend by illustrating the case of Spain, taken as an example for the commonly observed decentralization patterns of modern economies (data are taken from Gemmell *et al.* 2013). In Spain over the period 1972-2005 the proportion of public expenditures in the hands of sub-central governments with respect to aggregate general government spending (*i.e.* expenditure decentralization) has always been higher than that of tax revenues (including all types of local taxes, *i.e.* own, shared, piggybacked, etc.) as a share of general government tax revenues (*i.e.* tax decentralization).

Figure 1. Tax (TD) and expenditure (ED) decentralization in Spain, 1972-2005
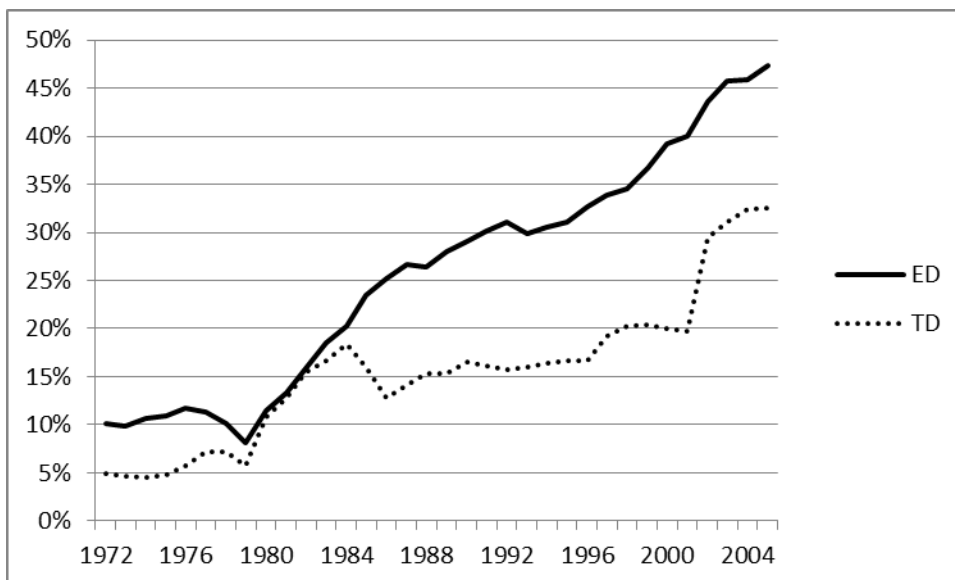
An even more interesting issue is whether this mismatch has been corrected over time or if there is a tendency of these two fiscal decentralization measures to move together. With regards to OECD countries, it has been observed that: "in the decade 1995-2005 (…) the vertical fiscal gap has increased; hence, decentralization has become more asymmetric" (OECD 2009b, p. 4). However, one may expect short-term asymmetries due to diverse governments' abilities to borrow. Those imbalances should be short-lived and should not have any long-run impact on the decentralization process.

Thus, we report in Table 1 evidence for OECD countries during the period 1972-2001 in order to verify whether the asymmetric nature of fiscal decentralization is a long-term phenomenon. The table contains simple pairwise correlations obtained using four expenditure decentralization (*ed1*, *ed1s*, *ed2*, and *ed2s*) and three tax decentralization (*td1*, *td2*, and *td3*) indices constructed by Stegarescu (2005 – but similar results are obtained with those of Gemmell *et al.* 2013). The indices differ in terms of their degree of real autonomy granted to sub-central governments and, in the expenditure case, also due to the inclusion/exclusion of social security spending (see Stegarescu 2005 for more details; the same data are used by Thornton 2007, Kyriacou and Roca-Sagalés 2011, Sacchi and Salotti 2014).

We use Spain, Germany, and Japan as main examples, as well as including the correlations for the group of 23 OECD countries whose data coverage is adequate. A striking feature of the disparate correlations in Table 1 is that the different definitions of the indices do not appear to be the reason behind such differences. Positive correlations prevail in the OECD sample as a whole, but this masks diverse country-specific experiences, as highlighted by the different signs of the correlation coefficients for the three countries shown in Table 1. For example, in Japan tax and expenditure decentralization seem to follow diverging pattern during the sample period (*i.e.*, the tax and expenditure decentralization indices are negatively correlated). In Germany the evidence is mixed, with some tax decentralization indices negatively correlated with their expenditure counterparts, and some positively correlated. Finally, in Spain positive correlations prevail among the various indices.

Table 1. Correlations among tax and expenditure decentralization indices (1972-2001)

	Spain					**Germany**			
	ed1	*ed1s*	*ed2*	*ed2s*		*ed1*	*ed1s*	*ed2*	*ed2s*
td1	0.66*	0.64*	0.69*	0.66*	*td1*	0.01	0.18*	0.29*	0.34*
td2	0.95*	0.94*	0.89*	0.88*	*td2*	-0.03	-0.34*	0.60*	-0.09
td3	0.82*	0.82*	0.91*	0.91*	*td3*	-0.03	-0.34*	0.60*	-0.09
	Japan					**23 OECD countries panel**			
	ed1	*ed1s*	*ed2*	*ed2s*		*ed1*	*ed1s*	*ed2*	*ed2s*
td1	-0.52*	-0.79*	-0.19*	-0.58*	*td1*	0.64*	0.74*	0.70*	0.78*
td2	-0.52*	-0.79*	-0.19*	-0.58*	*td2*	0.79*	0.75*	0.94*	0.88*
td3	-0.38*	-0.68*	-0.06	-0.47*	*td3*	0.79*	0.75*	0.94*	0.88*

Note: * indicates statistical significance of 5%.

Therefore, not only it is common to observe a mismatch between expenditure and tax decentralization, but also it is unclear whether this asymmetry has reduced or increased over time. More precisely, there is no evidence of widespread tendencies to reduce the asymmetry. Why are central governments in industrialized countries 'reluctant' to increase the autonomy of local governments, particularly on the revenue side? The next section of the paper proposes a theoretical framework that ends up explaining the existence of the persistent tax/expenditure decentralization mismatch even by assuming that individuals favorably perceive well-balanced fiscal decentralization.[4]

3. The theoretical framework

We assume an economy with total population N and two different levels of government, the central government and two regions ($j = 1,2$) of equal size, *i.e.* $N_1 = N_2 = N/2$, without loss of generality in the results. Central and sub-central governments provide non-rival public goods and services of different type (respectively, g_C and g_{Lj}). For instance, g_{Lj} may refer to infrastructure or education services provided to citizens belonging to the region according to local preferences ($0 < \alpha_j < 1$). In turn, public services supplied by the central government, g_C, are of uniform type and may include national public goods (*e.g.*, defense and stabilization policies); g_C is provided according to general individual preferences ($0 < \beta < 1$). Our approach is similar to that of Stegarescu (2009) even though with a different baseline scenario and different aims. We also follow the *Decentralization Theorem* of Oates (1972) by assuming homogenous individual preferences for local public goods within-region and heterogeneous ones across regions, *i.e.* different α_j exist, so different g_{Lj} are allowed. We use g_L hereafter in order to simplify the notation. On the other hand, preferences for central public provision are assumed (without loss of generality) to be homogenous across regions, *i.e.* $\beta_j = \beta_k = \beta$.[5]

In providing public services to individuals, both sub-central and central governments perfectly execute the policies determined by the representative individual according to a demand-driven political process. We do not include any political economy considerations as we focus on the

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[4] Our model focuses on the demand side of the question, which has been explored by other researchers in relation to different matters. For example, Eichenberger (1994) studies the individuals' benefits from fiscal decentralization in an analysis on the citizens' incentives to make use of the voice and exit options. A more recent study by Bähr (2008) proves that sub-national autonomy positively affects the effectiveness of the European Union's regional policy in promoting growth when the states exhibit a higher degree of decentralization.

[5] We could allow preferences for central government services to differ across regions as in Stegarescu (2009) without obtaining different results. However, we choose to simply focus just on pure economic factors promoting fiscal decentralization, rather than relying on differences in preferences (see also Arzaghi and Henderson 2005). Also, central and local governments may also provide different components of the same function (*e.g.*, local primary schools and national university) as it commonly happens in many developed countries. In this respect, one can observe - also historically - a frequent overlapping of responsibilities between different tiers of government, which has led to implementing the same function by the central government and sub-central authorities.

relationship between expenditure and tax decentralization. Likewise, our model assumes that stratification *á la* Tiebout (1956) has already taken place and, since individuals are already sorted according to their preferences, there is no role for mobility (Alesina and Spolaore 1997).

We define the degree of expenditure decentralization as the local government share in total public services provided in the regions: $\theta = g_L / g$ where $g = g_C + g_L$ represents total (central plus local) public expenditure, as in Stegarescu (2009 – for similar applications see Panizza 1999; Alegre 2010). Thus, we can re-define local and central public goods as functions of the expenditure decentralization degree and total spending, *i.e.* $g_L = \theta g$ and $g_C = (1 - \theta)g$, with the parameter θ identifying the level of expenditure decentralization in aggregate terms.

Representative individuals in both regions pay the fixed contribution p_j to finance the cost of public provision, which is equal to the per capita costs of local and central public spending: $p_j = \dfrac{g_C}{N} + \dfrac{g_L}{N/2}$. One part of p_j is collected by the local governments (to finance, at least partially, g_L) and the other part of p_j goes to the central government (to finance g_C and, *via* grants, g_L for the part exceeding local revenues).

Based upon these assumptions, the representative individual's utility function in region *j* is given by the following:

$$U_j = \ln(g_L)^{\alpha_j \gamma_j} + \ln(g_C)^{\beta} + y_j - p_j \tag{2.1}$$

where y_j is personal income, which also represents regional income as we have assume homogeneous income among individuals within the same local unit. Income distribution issues are beyond the scope of the paper as we focus on efficiency considerations related to expenditure decentralization.[6]

The parameter γ_j (satisfying $0 < \gamma_j < 1$) proxies for the regional preference for the degree of local expenditure financing through own local taxes rather than grants. A higher value of γ_j implies wider fiscal autonomy granted to sub-central authorities, possibly yielding more benefit from local public goods provision to citizens thanks to well-tied revenue and expenditure decisions. In the actual framework, where expenditure decentralization is normally more pronounced than tax decentralization, this is likely to correspond to a preference for a higher level of the latter. The idea is that citizens perceive positively the role of tax decentralization as it is a byword for sufficient

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[6] That is why we adopt a quasi-linear utility function that rules out income effects for the two types of public expenditure. Moreover, we are not interested in dealing with the individual choice between private and public consumption and how income is spent, so we do not include directly the private good into the utility function.

budgetary autonomy to carry out the assigned spending responsibilities (McLure and Martinez-Vazquez 2000) and can favor more accountability and transparency in local financing mechanisms (see also Bordignon and Minelli 2001). The theoretical basis for this assumption is provided by the existing literature (see Weingast 2009, 2014 for extensive reviews) suggesting that the best way to enforce the effectiveness of the decentralization process is to assign significant tax autonomy and decision power to local governments. As pointed out by Bordignon and Piazza (2010, p. 2), "it is self-financing, more than decentralization per se, the key ingredient of a successful decentralization process." Indeed, own resources are seen to make local governments more likely accountable for their fiscal decision (Bahl and Linn 1992; McLure 1998; Martinez-Vazquez and McNab 2003) as well as residents more informed on how representatives spend public money (Boetti *et al.* 2012 demonstrated that this also increases the local governments' efficiency).

All these aspects are captured in our model by the parameter γ_j, which positively affects individual welfare: more tax decentralization and autonomy increases the benefit of local spending (g_L). We assume the same preference for the degree of tax decentralization across regions, *i.e.* $\gamma_j = \gamma_k = \gamma$, as it is an issue reasonably shared among individuals and it does not alter the results. Hence, we refer to the same γ hereafter to simplify the notation.

Individuals' preferences for central spending are also assumed to be influenced by the degree of tax decentralization although the sign of this effect is unclear *a priori*. For example, demand for goods provided by the central government can become relatively less important when the local government is more fiscally autonomous. On the other hand, there could be a "complementarity effect" as, when the degree of tax decentralization increases, citizens may prefer higher central spending because the central government can redirect resources from grants to g_C and ensure higher quality/quantity of its services. This gives rise to an indirect impact of γ on the utility function through its marginal effect on β (*i.e.* β_γ), that can be either positive or negative.

Substituting g_L and g_C both in p_j and in the utility function, we can re-write equation (2.1) as follows:

$$U_j = \ln(\theta g)^{\alpha_j \gamma} + \ln[(1-\theta)g]^{\beta} - \frac{g(1+\theta)}{N} \qquad (2.2)$$

Differentiating with respect to g and θ, we then obtain the optimal level of fiscal decentralization and total public expenditure for the inhabitants of region *j*:

$$g* = \frac{N}{2}\left(2\beta + \alpha_j\gamma\right) \tag{2.3}$$

and

$$\theta* = \frac{\alpha_j\gamma}{2\beta + \alpha_j\gamma} \tag{2.4}$$

The degree of tax decentralization raises total public output in this case ($\frac{\partial g*}{\partial\gamma} = g_\gamma^* > 0$); while

the correlation between tax and expenditure decentralization parameters is not clear *a priori*: $\theta_\gamma^* \lesseqgtr 0$

due to $\frac{\partial\theta*}{\partial\gamma} = \theta_\gamma^* = \frac{2\alpha(\beta - \gamma\beta_\gamma)}{(2\beta + \alpha_j\gamma)^2}$. Indeed, the linkage between local tax autonomy and the degree of

expenditure decentralization is also affected by the marginal effect of tax decentralization on the

preferences for central public goods provision, represented by β_γ. When the latter is relatively small

(*i.e.* $\beta_\gamma < \frac{\beta}{\gamma}$), tax decentralization and expenditure decentralization are positively associated

($\theta_\gamma^* > 0$); otherwise (*i.e.* $\beta_\gamma > \frac{\beta}{\gamma}$), the opposite conclusion can be drawn ($\theta_\gamma^* < 0$). This can be

explained by the fact that a higher preference for central spending may lead to more tax centralization
in order to finance such spending, with consequences on the investment costs for establishing tax
collection units and potential economies of scale in processing those taxes. This may influence local
governments causing a lack of correspondence between the two sides of their budgets.

Thus, tax decentralization is not necessarily positively correlated with expenditure
decentralization, even assuming its beneficial impact on the individual welfare. The ambiguous nature
of this correlation, even in a framework designed to be favorable to tax decentralization, contributes to
explain the persistency of the fiscal mismatch between local tax revenue and decentralized
expenditure that characterizes many industrialized countries.

4. Conclusions

Most advanced economies are characterized by a relevant mismatch between tax and expenditure
decentralization, with the former normally being more limited than the latter. Our paper studies the
asymmetric nature of these fiscal decentralization arrangements. Using a theoretical framework that
assumes that individuals positively perceive a balanced and well-defined fiscal decentralization
process, we find that the relationship between expenditure and tax decentralization is indeterminate.
Thus, we conclude that asymmetry is intrinsic to fiscal decentralization. Future theoretical and

empirical contributions would benefit by taking this feature into consideration rather than unrealistically assuming perfectly balanced decentralization processes.

Our result seems particularly relevant given the evidence of adverse effects on the economy of asymmetric decentralization. A number of recent contributions (*e.g.*, von Hagen and Foremny 2013; Marcos and López Laborda 2013) prove that decentralizing exclusively on the expenditure side, but not the revenue side, weakens fiscal discipline. In Spain, for example, some design characteristics of the financing system may have aggravated the problem as, despite the progress made in fiscal co-responsibility over recent years, it seems that the autonomous regions have yet to consider their budgetary restrictions as binding (Lago Peñas 2013). The response of the central government to this problem has been to impose a centralized and hierarchical control of regional budgets, contributing to enlarge the local fiscal mismatch between revenue and expenditure.

The recent crisis of 2007-09 may have aggravated the problem. Given the importance of property taxes in the revenue-side of the sub-national budgets in most industrialized countries (Liberati and Sacchi 2013), the widespread falls of housing market prices have determined a substantial decrease in sub-central revenues. This implies that local governments may now be less able to comply with the increasing expenditure responsibilities that have been assigned to them. Canavire-Bacarreza and Martinez-Vazquez (2013) observe that this can damage citizens' confidence and cause central governments to use the crisis as a mean to justify decelerating (or even reversing) the decentralization process (particularly in those countries where decentralization does not have a long tradition and/or where it has been subject to controversy in the past). Thus, the decentralized expenditure/revenue mismatch documented by our study assumes seems to be particular relevant today. The macroeconomic policies put in place during economic downturns and the continuously deteriorating budget balances may lead to more asymmetric fiscal decentralization with additional adverse consequences on the economy.

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