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IN SEARCH OF THE LEVIATHAN AT THE SUBNATIONAL LEVEL. EVIDENCE FROM OECD COUNTRIES (1995-2018)

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Abstract.

This paper empirically investigates the impact of subnational revenue sources on local government size in 30 OECD countries over the period 1995-2018. Contrary to the findings in related research, the expenditure increasing or "fly paper" effect of vertical transfers could not be confirmed. Own tax revenue is shown to significantly contain subnational expenditure. However, this impact is conditional on the extent of political decentralization and of local autonomy that could incite soft budget policies.

Keywords: fiscal decentralization, fiscal autonomy, government size, public expenditure

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1. Introduction.

The process of economic globalisation that intensified during the past decades, increasingly put pressure on governments in the Western hemisphere to increase the competiveness of their national economies. A major theme is this evolution relates to constraining the size of the public sector and simultaneously reducing overall taxation. The perception of the central government as a monopolist, monolithic Leviathan, extracting tax revenue form the citizens, has been challenged in economic theory by Brennan and Buchanan (1980, p.185) who stated that " Total government intrusion into the economy should be smaller, *ceteris paribus,* the greater the extent to which taxes and expenditures are decentralized…". During the decades following this contribution, decentralization dramatically increased in OECD countries (Allain-Dupré, 2020), resulting in larger shares of subnational public outlays in total public expenditure.

The constitutional framework for containing the Leviathan was offered as early in 1972 by W. E. Oates in *Fiscal Federalism* (Oates, 1972*)*, elaborated in his seminal paper : *"On the Welfare Gains from Fiscal Decentralization*" (Oates, 1997). According to this approach, subnational governments (SNGs) deliver an efficient allocation of resources that is tailored to the heterogeneous preferences of their citizens, promoting inter-jurisdictional competition. The mobility of the local tax base, invoked by Tiebout (1956), would thereby sustain the benefits from a decentralized supply of public goods. This optimistic view on the virtues of fiscal decentralization has been subject to criticism pointing to the economies of scale derived from a centralized provision of public goods and to the need for redistribution that preferably should be organized by the central government (Musgrave, 1959).

In the past decades, the Leviathan hypothesis has been subjected to a substantial number of empirical studies at the country and subnational level, reviewed by e.g. R. Yeung (2009). On balance, the empirical evidence of the Leviathan hypothesis is rather mixed, resulting in its inconclusive overall appreciation. Rodden (2003) points to at least two reasons for this failure: first, the reliance of the bulk of the relevant research on cross-national data instead of using panel data at the subnational level and second, the inadequate measurement of appropriate indicators of fiscal decentralization. Subnational expenditure or revenue shares only reflect

aspects of institutional decentralisation but more importantly, they overestimate the autonomy SNGs are able to exert on their budgets. Part of their expenditure, e.g. on infrastructure investment, may be mandated by the central government (Stegarescu, 2005), jointly with revenue transferred in the form of grants. The latter, i.e. vertical transfers, constitute an important element in the revenue mix of the OECD SNGs that may be complemented with autonomously raised tax revenue, property income and user fees. SNG tax autonomy, represented by the share of own taxes in subnational total revenue, favours the accountability of governments towards their electorate in contrast to transfer dependency. From this point of view, tax autonomy creates incentives for SNGs to stimulate growth, to expand their tax base and to contain the size of government. Moreover, as pointed out by the proponents of the *"second generation or market preserving federalism"* (Brennan and Buchanan,1980; Qian & Weingast,1997; Weingast, 2014), tax competition between jurisdictions and the mobility of the tax base will result in smaller governments.

It is the purpose of this paper to empirically verify the relationship between subnational tax autonomy and the size of the SNG public sector on the basis of OECD consistent data for 30 member countries over the period 1995-2018. This paper takes an aggregate view on the subnational public sector: no distinction is made between public consumption, public capital expenditure and social transfers. In this framework, two main research questions are raised:

- To what extent does SNG tax autonomy impact the size of the subnational public sector?
- Does vertical transfer revenue sustain or weaken the assumed impact of tax autonomy on public sector size?

The paper is organized as follows. The literature and empirical research on the Leviathan hypothesis in explaining subnational government size will be briefly summarized in the next section. In the subsequent section, the data, specification and estimation method of the suggested model will be presented, followed by the interpretation of the estimation results. The final section summarizes the main conclusions and recommendations for further research.

2. Theoretical arguments and empirical evidence.

2.1 Theoretical arguments.

The vast literature on the Leviathan hypothesis has been developed in the institutional framework of "fiscal federalism". This institutional setting refers to a constitutional landscape in which subnational governments enjoy in different degrees autonomy in their policy making and in its financing. SNGs are assumed to supply public goods according to the preferences of their constituencies. Oates (1972, p. 35) proposed in this setting his well-known decentralization theorem, stating that it will always be more efficient for SNGs to provide public goods (assuming an identical cost of production in all jurisdictions) than the central government that would provide a uniform output across all jurisdictions. It is important to note that the assumption of a uniform cost of production excludes economies of scale in the production of public goods. In other words, abstracting from externalities arising from their decentralized supply and taxation, public goods are provided at lower costs in the framework of fiscal federalism in comparison to a centralized supply. This positive view on the virtues of fiscal federalism has been put in a perspective by the author of the decentralization theorem (Oates, 2006) who points to fiscal malfunctions such as the practice of soft budget constraints that invite local policy makers to spend public funds inefficiently.

Oates' efficiency argument has been re-interpreted by Brennan and Buchanan (1980), Weingast (1995) and by Rodden (2003) in the framework of a "market preserving federalism", characterized by competing jurisdictions across which taxpayers, capital and labour can move

freely at no cost. In this setting, SNGs will compete in attracting mobile tax bases, thereby reducing or eliminating rents. As local governments are hold accountable towards their constituencies for their tax policy, they will endeavour to tailor their expenditure programs to the preferences of their electorate. Tax competition will therefore result in small governments. Rodden (2003) notes that, as a result of tax competition, the burden of taxation will be shifted to the owners of less mobile assets and eventually to land owners.

"Market preserving federalism" has been subject to severe criticism. First, tax competition as well as a decentralized supply of public goods may give rise to externalities that need to be resolved either by the central government or by agreements between local governments (Wilson, 1999). Second, jurisdictional competition may turn out less competitive than assumed by its proponents (Sorens, 2014), since the free movement of taxpayers across jurisdictions may entail costs. The higher these costs, the less price elastic the demand for public services will be, giving governments some degree of local monopolistic power. Furthermore, jurisdictional competition may make room for collusion between SNGs that exploit the central government by demanding transfers as a substitute for local taxes. A third critique refers to the underlying assumption of hard budget constraints, Oates also referred to in his 2006 paper. When SNGs are compelled to borrow on capital markets they may have to pay risk premiums thus exceeding the cost of borrowing paid by the central government. When the necessity of borrowing on capital markets can be avoided through transfers from the central government in order to balance their budgets, local governments tend to spend more than when they are subject to a hard budget constraint (Moesen & Van Cauwenberghe, 2000). A final and important criticism relates to the efficiency approach that colours "market preserving federalism". In the real world, SNGs as well as the central government are concerned with equity considerations. In this respect, marked differences in SNG tax raising capacities or public service costs justify the redistributive role of the central government, that can perform this policy more efficiently (Musgrave, 1959).Therefore, when SNGs engage in social policies they tend to spend more than a centralized approach would realize. It is not clear to what extent competition between jurisdictions in social matters would modify this conclusion.

To summarize this succinct overview of the Leviathan hypothesis: fiscal federalism favours smaller governments, conditional on hard subnational budget constraints and on a sufficiently large number of competing jurisdictions, apart from the unclear implications of decentralized social policies.

2.2 Empirical Evidence.

Oates (1985) tested as one of the first his decentralization hypothesis in a cross section sample of 43 countries, using IMF Government Finance Statistics. Government size is measured by the ratio of total public revenues to GDP whereas revenue and expenditure shares of the central government stand for centralization. A systematic relationship between centralization and government size in support of the Leviathan hypothesis could not be established in this study. Stein (1999) was the first to draw attention on the impact of vertical imbalance in the revenue mix of subnational governments on government size. He found in his cross section study of Latin America and the Caribbean (1990-1995) a significant positive relationship between government size, expenditure decentralization and transfer finance. Yeung (2009) reports up to 2008 (included) not less than 30 assessments of the Leviathan hypothesis at the country level and 51 studies at the state or local level, all with mixed results. The overwhelming majority of this research relied on cross section samples, thus neglecting the dynamics that may characterize the process of fiscal devolution. On the other hand, Rodden (2003) used panel data from 1978-1997 for 44 countries with yearly observations. He explicitly focussed on the impact of intergovernmental transfers on subnational government size in order to test the "common pool" hypothesis. His underlying assumption is that subnational revenue obtained without any tax

effort may be compared with "fly paper" and will consequently boost SNG public expenditure. Using a fixed effects model he finds conclusive evidence that own source revenue constrains subnational government expenditure in contrast to grants that sustain the expansion of government size.

Following Rodden's innovating contribution, the empirical literature on the subject developed along divergent avenues: country studies e.g. by Feld et al. (2003) on Swiss state and local governments, Boetti et al. (2009) on 262 Italian municipalities, a European wide analysis (Casette & Paty, 2010), alternated by research on the impact of fiscal decentralization on specific public expenditure categories Cincera et al.(2012) for EU countries. Instead of using revenue shares as an explanatory variable, the relevance of solid measures of subnational fiscal autonomy represented by own source revenue, was stressed by Rodden (2003) and by Ebel & Yilmaz (2002), followed by Meloche et al. (2004). They found a significant negative impact of SNG own revenue on government size that contrasted with the positive effect of transfer revenue and tax sharing. These authors pointed to the shortcomings of the IMF Government Finance Statistics that fail to discriminate between revenue subjected to the discretionary power of SNGs and revenue originating in tax sharing. Instead they relied on – at that time new- OECD data, available from 1995 onwards for most member countries, that distinguish tax revenue for which SNGs could set rates, the tax base and reliefs from shared taxes and grants.

Another strand of empirical research introduces new dimensions in the Leviathan debate such as the subnational government's ideology (Baskaran, 2009), the level of democracy in the countries studied (Qiao et al. 2019) and the relevance of the subnational budget constraint (Moesen & Van Cauwenberghe, 2000). Sorens (2014) introduces indicators of jurisdictional competition and cultural fragmentation in a panel study of 23 countries from 1963 to 2006 and finds, not surprisingly, that spatial competition favours fiscal decentralization without reducing spending on social programs. Liberati & Sacchi (2013) distinguish property taxes from income taxes and taxes on goods and services at the local level in an unbalanced panel study of 19 OECD countries over the period 1980-2004 and find that the negative impact of property taxes on government size clearly dominates. Finally, a few studies (Jin et al., 2002; Eyraud & Badia, 2013) take account of the interaction between fiscal decentralization and aggregate, central and subnational government size.

The empirical studies reviewed here indicate that fiscal decentralization by itself does not guarantee smaller subnational government size. But as variables reflecting the reliance on own revenue are brought in the analysis, their containment impact on public expenditure apparently verifies. Other variables such as jurisdictional competition, balanced budget requirements and political decentralization sustain and strengthen this effect.

3. **Data and estimation design**.

3.1 Data on fiscal decentralization.

The OECD Fiscal decentralization database offers a consistent set of data on subnational expenditure, revenue and public debt for OECD member countries from 1995 onwards. The subnational governments refer to local governments in unitary countries and to both local and regional governments in federations. This database distinguishes subnational revenue in three categories: tax revenue, intergovernmental transfers and user fees. As for tax revenue, the focus in this paper is on own tax revenue, i.e. taxes for which the government has a discretionary power to set rates or define reliefs or to decide on both. The revenue from tax sharing arrangements with the central government is also mentioned but is relatively small when compared with own revenue. But as was pointed out by Blöchliger and Petzold (2009), shared taxes are often indistinguishable from transfers. Initially, data on subnational tax revenue was

only available for some years from 1995 onwards. Today, every year from 2000 up to 2018 has been covered, though leaving a gap for the period 1996-1999.

In this paper the 30 following OECD countries are taken into consideration: Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Luxemburg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, the UK and the United States. For these countries, a complete and consistent set of data could be constructed. The nine federal countries studied are: Australia, Austria, Belgium, Canada, Germany, Mexico, Spain, Switzerland and the United States. Tax revenue data for regions and local governments are aggregated in these federations; using their respective tax revenue as weights. As for the unitary countries, their fiscal data refer to local governments.

3.2 The main fiscal variables.

Subnational total public expenditure, obtained from the Fiscal Decentralization Database, is expressed as a percentage of GDP and is denoted by *Rexp.* The main fiscal explanatory variables are: subnational own tax revenue *Tax* and transfer revenue *Transf.* Own tax revenue refers to subnational revenue as it is defined above. It is expressed as a percentage of the total revenue of the subnational government. The same holds for transfer revenue. As has been argued in "the second generation or market preserving federalism", jurisdictional tax competition will induce governments to produce public services efficiently since they will be held accountable towards their electorate and because of the mobility of their tax base. Therefore, the expected impact of *Tax* on *Rexp* will be negative, contrary to the effect of transfer revenue that originates in a "common pool" from which subnational governments can draw at no cost. Since vertical transfers constitute an important revenue source for subnational governments in OECD countries, particularly in the majority of the unitary countries, the joint impact of transfers and own revenue on expenditure will be analysed through the interaction variable *Taxtransf.* The OECD data on autonomous taxes show little or no year-to-year changes. Moreover, at the start of this research, OECD data on fiscal autonomy did not cover each year from 2000 onwards. This fact as well as the data gap for the period 1996-1999 justified the use of 6 period averages: the first from 1995 to 2000, the following each covering 4 years, i.e. 01-04, 04-08, 08-'12, '12-'16 and the last one from '16 to '18, i.e. the most recent year for which the relevant data are available. Data on expenditure and transfers are constructed similarly.

3.3 The control variables.

The demand for public goods depends, among others, from real income. Since the empirical study refers to the country as the geographical unit of analysis, real national GDP per capita in 2015 US dollars (*GDP*) figures as an explanatory variable. Subnational tax revenue is to some extent sensitive to the business cycle that is captured by the OECD output gap variable *Gap.* This measure of the business cycle is preferred to the commonly used unemployment rate variable that reacts with time lags to changes in output. Rodrik (1998) found a stable and positive relationship between the exposure to international trade of a country and its government size, indicating that governments act as an insurance agency in case the economy is exposed to adverse shocks. The control variable *Open* is the ratio of the sum of exports and imports to GDP and is supposed to test Rodrik's hypothesis at the subnational level. Subnational debt service impacts public expenditure. Its effect on government size is approached through the variable *Debt*, i.e. the ratio of outstanding subnational public debt to GDP.

The more subnational governments are autonomous in their policy making, the more will they be held accountable towards their electorate for their expenditures. The degree of political decentralization and regional autonomy is captured by the variable *Self* that is obtained from

the regional-national dataset on regional authority, constructed by Hooghe et al. (2016). *Self* refers in this dataset to the aggregate variable "Selfrule" that takes values between 0 and 18 and in turn results from the summation of 5 subnational scores: institutional depth (1 to 4), policy scope and autonomy (0 to 4), fiscal autonomy (0 to 4), borrowing autonomy (0 to 3) and representation (0 to 3). The subnational scores are aggregated into a country score, using population shares as weights. In short, *Self* reflects the degree of representative authority local and regional governments are capable of exercising in their respective jurisdiction. Since the degree of fiscal autonomy is part of *Self*, one would expect a positive correlation of *Self* with the variable *Tax*. Yet, the insignificant sample correlation between these two variables amounts to 0.1485. Above average values of *Self* are obtained for the federal countries Belgium, Canada, Germany, Spain, Switzerland and the US. Two unitary countries, i.e. France and Italy also show above average scores, mainly because of the borrowing autonomy of their local governments. Other control variables are *Dep*, the nationwide age dependency ratio (population over 64 to the population between 14-64) and *Pop*, total national population. The former is, according to conventional wisdom, assumed to increase expenditure on amenities and social protection for the elderly whereas the latter is an imperfect but time-variant proxy for the size of the country and for the density of its population that may engender expenditure reducing economies of scale.

3.4 Model specification and estimation method.

The large variety of time-invariant institutional and cultural characteristics of the 30 OECD countries under review here, suggests in the first place a fixed-effects (FE) approach in the panel data analysis, assuming that the dependent and explanatory variables are stationary. The set of panel data is of a particular nature, due to the availability of data on SNG own revenue explained in section 3.2. As a matter of fact, 6 period averages characterize the time dimension of this balanced panel, implying that the estimation results predominantly reflect cross-section impacts in comparison with the dynamic effects of the explanatory variables.

The basic model specification is linear and has the following form, allowing in principle for the interaction of *Tax* and *Transf*:

$$Rexp_{it} = \alpha + \beta_1 . Tax_{it} + \beta_2 . Transf_{it} + \beta_3 . Taxtransf_{it} + \gamma . Controls_{it} + \tau_i + \mu_{it} \ (i=1,2,3\ldots,30; \ t=1,2,3,\ldots,6) \tag{1}$$

where *Controls* refers to : *GDP, Open, Gap, Pop, Dep, Self* and *Debt* . The main statistics of the variables in equation (1) are reported in the Appendix.

The country specific effect is denoted by τ and μ is the time and country related error term. The variables in equation (*1*), except for the business cycle variable *Gap* are, according to the appropriate Harris-Tzavalis (1999) unit root test when n is large and t small, non- stationary at a 5 % significance level. In this case, the efficiency of a FE estimator is not guaranteed. This can be remedied for by taking first differences of all variables in equation (*1*), eliminating the country specific constants τ_i :

$$\Delta Rexp_{it} = \beta_1 . \Delta Tax_{it} + \beta_2 . \Delta Transf_{it} + \beta_3 . \Delta Taxtransf_{it} + \gamma . \Delta Controls_{it} + \Delta \mu_{it}$$
$$(i=1,2,3\ldots,30; \ t=1,2,3,\ldots,6) \tag{2}$$

The first differences of all variables in equation (*2*) prove to be stationary. In order to take account of potential residual correlation, a Random Effects (RE) GLS estimator of equation

(*2*) with clustered standard errors at the country level is preferred. Finally, attention ought to be given to the endogenous character of the explanatory fiscal variables that may arise since higher (lower) expenditure rates may trigger more (less) taxation and vice versa. An instrumental variable estimation of the equation (*2*) is apt to confirm the exogenous impact of own tax revenue on expenditure.

4. Empirical results.

4.1 Results from the basic model.

Table 1 reports on the estimation results of equation (*2*). Since the parameters in this equation are identical to those in equation (*1*), their estimates represent the impact on subnational expenditure of percentage point changes in the level of the explanatory variables as well. Apparently, the parameter estimates of *Tax, GDP, Gap, Dep* and *Self* are all significant at various degrees. As for the *Tax* variable, it appears from the estimates in column (a) that an increase of a 1 percentage point of the share of autonomous revenue in total subnational revenue contributes to a reduction of subnational public expenditure (relative to GDP) by 0.08 points.. This impact is independent of the amount of transfers SNGs receive since the parameter estimate of the interaction variable in column (a) *Taxtransf* as well as the parameter estimate of *Transf* prove to be insignificant. At a first glance, the statistically insignificant impact of transfer revenue on expenditure could be ascribed to the negative and significant correlation (r=-0.66) between *Tax* and *Transf*. This characteristic is due to the fact that when SNGs finance their expenditure to a large extent with own revenue, they rely less on transfers or they are not considered eligible by the central government. The significant negative impact of own revenue on expenditure, that is almost identical to the one in column (a), is confirmed in columns (c) and (d) of Table 1, where transfer revenue is dropped from equation (*2*).

Contrary to the expenditure constraining effect of own revenue, it appears from the significant parameter estimates of *Self*, that as SNGs are institutionally more empowered and hold accountable to their constituency, they tend to spend more. Qiao et al. (2019) found that high degrees of democracy, implying that governments are receptive to the expenditure preferences of their electorate, may counterbalance the constraining impact of fiscal autonomy, thus resulting in larger governments. Since *Self* is a composite indicator, referring to political decentralization, representation and autonomous decision making, it is not clear which of its components dominates its impact on expenditure. Although the decentralization of taxing power positively affects the fiscal stance of the SNGs (Baskaran, 2012; Van Rompuy, 2016), it does not guarantee balanced budget. Hence, the practice of soft budget constraints resulting from a high degree of subnational borrowing autonomy may well be at the origin of the positive expenditure effect of *Self,* thus neutralizing the potential containing effect of representative and accountable governments. In order to test the effect of the borrowing autonomy of subnational governments on government size, the country score of borrowing autonomy ranging from 0 to 3, measured in first differences, was substituted for *Self* in equation (*2*). Its parameter estimate amounted to 0.3970 showing a z-value of only 1.34. The limited range of values taken by the borrowing autonomy indicator may explain its low statistical significance that at most suggests its expenditure increasing effect.

The parameter estimates of the interaction of *Tax* and *Self* are reported in column (d). Apparently, the expenditure constraining impact of own revenue, facing institutionally more autonomous SNGs, vanishes at a magnitude of *Self* as high as 14.53. Since the range of *Self* is contained in the interval 0-18, this high cut-off value is typically obtained in the federations that figure in the sample studied: Australia, Austria Belgium, Canada, Germany, Spain and the

US, and surprisingly also in the unitary countries Italy and France, where local governments enjoy as mentioned before, a high degree of borrowing autonomy. In the remaining unitary countries, subnational fiscal autonomy clearly contributes to smaller subnational government size. Furthermore, in all columns of table 1, the negative parameter estimates of *GDP* indicates that local public goods are inferior, a finding that is confirmed in related research, such as in Rodden (2003). The significant positive parameter of *Gap* suggests that the budgetary policy of SNGs is pro-cyclical. The increased tax revenue resulting from cyclically expanding economic activity may induce SNGs to spend more, particularly since their policies are not primarily intended to stabilize the nationwide economy. This finding is in line with the widely accepted view that macroeconomic stabilization policies are more efficiently realized at the level of the central government. It appears that only in columns (a) and (b) the vulnerability to exogenous shocks, reflected in the variable *Open,* significantly and negatively impacts local public expenditure. As has been argued by Rodrik (1998) central, not local governments may be held responsible to efficiently offer social insurance against adverse shocks resulting from the exposure to trade.

Apparently, nationwide population size (or equivalently population density) (*Pop)* does not significantly affect subnational government size that may be more sensitive to its spatial dispersion and less to its absolute size. Finally, as the age dependency ratio, represented by *Dep* increases, subnational governments tend to be smaller. At first sight, this finding appears counter-intuitive, since a nationwide ageing population sustains the demand for health care, pensions and appropriate amenities. In this respect, (Razin et al., 2002) showed on the basis of a voting model that the conflicting demand for social benefits by the working population and the retirees results in equilibrium in a leaner welfare state, characterized by lower taxes and benefits. Furthermore, data for the US and 12 Western European countries over the period 1965-2002 showed in this study a negative correlation between the age dependency ratio and measures of the welfare state, i.e. the tax rate on labour income and the generosity of social transfers, illustrating the outcome of his theoretical arguments. These findings carry over to local governments who, in addition, may be dependent on budgetary assistance from the central government to finance part of their social policies.

4.2 Instrumental variable estimation.

In order to control for the potential endogeneity of *Tax,* equation (*2*) was estimated with the instrumental variable method, using appropriate instruments that affect own revenue and impact subnational expenditure through the latter. The share of transfers in general government revenue and central government expenditure minus transfers as a percentage of GDP, both in first differences form, were chosen as instruments. These instruments correlate to varying degrees with the tax variable and are, apparently, not related to subnational expenditure in a straightforward way. The complementarity or substitutability of transfers with respect to own tax revenue justifies the role of the former as an instrument. Furthermore, the size of the central government, including social security, may limit or widen the scope for autonomous tax policies pursued by subnational governments.

As a result of the instrumental variable estimation of equation (*2*), the significant parameter estimate of *Tax* amounts to -0.5717 (z=2.33). Although, when compared to the corresponding parameter estimate in columns (a), (c) and (d) of table 1, the impact of tax autonomy on subnational expenditure is smaller, it confirms its significant role in containing local government size.

Table 1. The impact of the subnational revenue mix on government size.

Dependent variable   *Rexp*

	(a)	*(b)*	*(c)*	*(d)*
ΔTax	-0.0834***	-------------	-0.0896***	-0.0988***
	(0,0187)	-------------	(0,0202)	(0,0196)
ΔTransf	0,0207	0,0345	----------	----------
	(0,0230)	(0,0303)	----------	---------
ΔTaxTransf	-0,0068	------------	----------	----------
	(0,0073)	------------	----------	----------
ΔTaxSelf	----------	----------	----------	0.0068***
	---------	---------	----------	(0,0025)
ΔGDP	-0.0859**	-0.0842***	-0.0884**	- 0.0868**
	(0,0402)	(0,0314)	(0,0421)	(0,0437)
ΔOpen	-0.0219*	-0.0227**	-0,0187	-0,0207
	(0,0121)	(0,0116)	(0,0132)	(0,0180)
ΔGap	0.1115**	0.0926**	0.1089**	0.1097**
	(0,0518)	0.0448)	(0,0527)	(0,0529)
ΔDep	-0.0927**	-0.1026***	-0.0885**	-0.0977***
	(0,0315)	(0,0330)	(0,0287)	(0,0297)
ΔPop	-0,0052	-0,0097	-0,0067	-0,0084
	(0,0272)	(0,0318)	(0,0264)	(0,0258)
ΔSelf	0.1693**	0,0899	0.1821**	0.1532*
	(0,0877)	(0,0772)	(0,0903)	(0.0877
ΔDebt	0,6997	0,0644	0,0595	0,0628
	(0,4738)	(0,0593)	(0,0482)	(0.0471
Constant	0,2767	0.3213*	0.3114*	0.3204*
	(0,1757)	(0,1916)	(0,1762)	(0,1719)
R2 within	0,1215	0,0897	0,0993	0,1170
R2 between	0.2493	0.1201	0.2852	0.2370

Notes : Number of observations=150; number of groups=30. Robust standard errors are clustered at the country
level and reported under the parameter estimate. *,**,*** significant at the 10 %, 5 % and 1 % levels, respectively.

5. Concluding Remarks.

In the related literature, fiscal decentralization raised expectations about its virtuous impact on the efficiency of the public sector. In these studies, emphasis has been put on the appropriate revenue mix that finances subnational government expenditure. In this respect, the revenue raising power of subnational governments has been considered as a solid guarantee for their accountability towards their electorate. Yet, transfer revenue originating in the central government is an important revenue source of subnational governments in unitary and federal countries. Equity considerations as well as the need to compensate for externalities resulting from local policies, explain the widespread transfer dependency of subnational governments. The wide variety of grant financing modes blurs the treatment of transfers in empirical research as one homogenous financing channel. An impressive strand of empirical studies points to the "fly paper" effect of transfers on subnational public expenditure, thus deteriorating the subnational fiscal stance. However, a significant positive effect of transfer dependency on public expenditure could not be confirmed in the empirical analysis presented here. On the other hand, the share of own tax revenue in total subnational revenue significantly constrains government size. Whether this impact can be ascribed to jurisdictional tax competition or to the strengthened accountability of local governments towards their constituencies, could not be discerned in the empirical analysis.

The scope for subnational governments to finance their expenditure with own tax revenue strongly depends on the economic and institutional characteristics of the specific country under review. This explains, as stressed e.g. by Gandullia (2012), the wide variety of subnational tax systems practised in OECD countries. The relevance of own tax revenue sources for subnational governments may inspire the avenues to be preferred in countries that envisage further steps in the process of devolution and fiscal decentralization, particularly in countries characterized by a modest subnational fiscal autonomy such as Belgium. In this case, the transfer dependency of the constituent subnational governments is still high when compared to other federations and to Scandinavian local governments. The personal income tax enjoyed by the three Regions is of a piggy-back type, dependent on the tax policies of the central government. Its transformation into a proportional tax rate within mutually agreed limits would undoubtedly strengthen the fiscal autonomy of the Regions and could contribute to the containment of their expenditure.

The limitations of the empirical research presented here are manifold and could be explored in further research. Instead of treating subnational public expenditure as a homogeneous variable, the distinction between public consumption and investment expenditure certainly would enrich the analysis. Finally, disentangling vertical transfers into relevant types of grants is apt to reconcile the divergence of various estimates of the impact on government size of subnational transfer dependency.

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Appendix.

Table A1. Main characteristics of the variables**.**

Variable	Mean	Standard deviation	Minimum value	Maximum value
Rexp	13.9	7.13	3.2	35.1
Tax	27.5	19.5	0	73.0
Transf	43.2	20.8	0	83.0
GDP	36.0	13.5	13.0	87.3
Gap	-0.5	2.2	-11.2	7.2
Open	87.9	40.2	23.0	217.0
Dep	51.0	5.5	38.5	67.1
Pop	31.5	56.8	.2	325.7
Self	11.6	7.5	0	26.7*
Debt	10.6	10.0	.8	56.3

- Values for *Self* higher than 18 are obtained in federal countries with three tier governments (central, regional and local).

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