

## THE EFFECTS OF FISCAL DECENTRALIZATION ON GENERAL AND LOCAL GOVERNMENT SIZE: DOES COMPOSITE INDEX MATTER?\*

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### Abstract

This article examines the impact of fiscal decentralization on the size of both general and local government using data for 36 countries over the period 1972–2019 and GMM. Our results consistently suggest that fiscal decentralization does not exert a significant impact on general government size. On the other hand, a positive relationship between fiscal decentralization and local government size exists. We should note that our baseline regression results do not significantly change when we use different fiscal decentralization indexes. Therefore, we do not find any evidence for the argument that fiscal decentralization would be helpful to restrict the expansion of government size. Moreover, we present some evidence for the flypaper effect. Additionally, we find a positive relationship between fiscal importance and local governments, interpreted as an indicator of expenditure competition instead of race to the bottom.

**Keywords:** fiscal decentralization, general and local government size, dynamic panel.

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## 1. Introduction

Fiscal decentralization is defined as the devolution of financial power and responsibilities from the central government to local governments (Neyaptı, 2005). There are two main theoretical approaches to fiscal decentralization. First generation theories adopt the benevolent government assumption and explain the concept in a normative way (Oates, 1972; Rubinfeld, 1987). Second generation theories, on the other hand, draw attention to the problems of political institutions and government failure (Weingast, 2008), fiscal incentives (Weingast, 2009; Lockwood, 2015), market preserving fiscal federalism (Weingast, 1995, 2009) and the industrial organization structure (Oates, 2005; Garzarelli, 2004). Despite these differences, both approaches regard fiscal decentralization as a tool to control the government size and protect the private markets from destructive violations (Oates, 2005).

There are two main arguments or motives for fiscal decentralization. First, fiscal decentralization would increase social welfare by ensuring the provision of more efficient public services and accountability due to better preference match and more engagement from voters. Second, fiscal decentralization would lead to a smaller government size. In the famous ‘Leviathan’ hypothesis developed by Brennan and Buchanan (1980), fiscal decentralization is proposed as a solution to limit the expansion of the public sector. According to this hypothesis, fiscal decentralization tends to constrain governments’ Leviathan-type behavior by creating a ‘race to bottom’ effect. Additionally, Josselin (1995) and Crow (2008) suggest that fiscal decentralization would exert a positive impact on local government size, called Local Leviathan in the literature. This implies that the effects of fiscal decentralization on the size of general and local governments would markedly differ from each other. In other words, fiscal decentralization would be related to a smaller (larger) general (local) government size on theoretical grounds.

Although fiscal decentralization has gained importance and popularity over time, its effects on government size are not clear-cut (Prud’homme, 1995; Tanzi, 2002; Rodden, 2003). Therefore, more empirical studies are deeply needed to shed light on the relationship between fiscal decentralization and government size at both general and local levels. There is no doubt that this issue has very important policy implications for designing and implementing fiscal policy.

Investigating the relationship between fiscal decentralization and government size for 36 countries over the period 1972–2019, this study aims to contribute to the existing literature in three important dimensions. First, we employ alternative indexes to better capture the different sides or aspects of fiscal decentralization. Some early studies including Davoodi and Zou (1998), Ebel and Yilmaz (2002), Stegarescu (2005) employ basic indexes as a proxy for fiscal decentralization due to their simplicity and availability. However, using just basic indexes to measure such a multidimensional concept would be both misleading and unrealistic (OECD, 2013). Therefore, more recent studies, such as Akai and Sakata (2002), Vo (2008), Martínez-Vázquez and Timofeev (2010), develop some composite indexes to avoid the possible problems

created by basic indexes. To capture the multidimensional aspects of fiscal decentralization, we follow the methodology of Vo (2008) and construct a composite index consisting of two components: fiscal importance and fiscal autonomy. In addition to Vo (2008)'s methodology, we also calculate basic indexes developed by Wallis and Oates (1988) and other composite indexes suggested by Akai and Sakata (2002) and Martínez-Vázquez and Timofeev (2010) to gain additional insights and check for the robustness of the results.

Second, somewhat surprisingly, only a limited number of studies empirically examine the relationship between fiscal decentralization and local government size (Rodden, 2003; Kwon, 2003; Craw, 2008; Boetti, Piacenza and Turati, 2012; Liberati and Sacchi, 2013; Jia, Guo and Zhang, 2014). Therefore, we aim to fill this gap in the literature by investigating the impact of fiscal decentralization on the size of both general and local governments in the same framework. In doing so, we would directly test and compare whether the Leviathan or Local Leviathan is more successful in explaining the effects of fiscal decentralization. Third, due to possible inertia in government spending, we employ a dynamic panel method (Generalized Method of Moments, GMM), which is also well-suited to deal with some econometric problems such as autocorrelation, heteroscedasticity, and endogeneity.

Our empirical results do not lend any evidence for the Leviathan hypothesis. On the other hand, we conclude that there exists a statistically positive relationship between the fiscal decentralization and local government size, supporting the existence of Local Leviathan. We should note that our main results are not sensitive to the choice of fiscal decentralization measure used in the empirical specifications.

The rest of the article is organized as follows. The next section summarizes the empirical literature. In section 3, we present the model specification and the data set. Section 4 reports and discusses the empirical results. The last section contains the conclusions.

## **2. Literature review**

As presented in the Annex, although many studies analyze the relationship between fiscal decentralization and general government size with different country groups, time intervals and econometric methods, there is no consensus on the issue whether fiscal decentralization is associated with a smaller government size or not. In other words, there is an ongoing debate as to whether fiscal decentralization would be helpful to limit the expansion of government size, as proposed by Brennan and Buchanan (1980). On the one hand, some studies such as Grossman (1989), Forbes and Zampelli (1989) or Joulfaian and Marlow (1991) found that fiscal decentralization has a negative effect on government size and hence confirm the Leviathan hypothesis. On the other hand, other studies like Oates (1972, 1985), Wallis and Oates (1988), Heil (1991) and Grossman (1992) firmly reject this finding.

In the early studies, consistent with first generation theories, the fiscal decentralization is measured by using basic indexes such as expenditure autonomy (Oates,

1972, 1985; Wallis and Oates, 1988; Heil, 1991; Grossman 1989, 1992; Joulfaian and Marlow, 1991), revenue autonomy (Wallis and Oates, 1988; Heil, 1991; Grossman, 1992) or province number (Forbes and Zampelli, 1989; Joulfaian and Marlow, 1991). However, since the first-generation theories neglect or ignore some important points such as lack of local own source revenue, soft budget constraints, fiscal inequalities and bailout effects, second generation theories have emerged and paid attention to these issues (Dziobek, Mangas and Kufa, 2011). These new theories show that measuring fiscal decentralization with revenue or expenditure autonomy instead of a more comprehensive index would cause a significant information loss in empirical studies (Martínez-Vázquez, Lago-Penas and Sacchi, 2017).

Therefore, later studies suggest more specific or comprehensive proxies for fiscal decentralization by considering additional dimensions such as own revenues (Rodden, 2003), vertical fiscal inequalities (Stein, 1999; Jia, Guo and Zhang, 2014; Makreshanska-Mladenovska and Petrevski, 2019), tax autonomy (Ehdaie, 1994; Kwon, 2013; Qiao, Ding and Liu, 2019) and composite indexes (Ehdaie, 1994; Prohl and Schneider, 2009; Qiao, Ding and Liu, 2019). Based on these more comprehensive or composite indexes, some studies such as Ehdaie (1994), Moesen and van Cauwenberge (2000), Rodden (2003), Prohl and Schneider (2009), Herwartz and Theilen (2017), Makreshanska-Mladenovska and Petrevski (2019), and Qiao, Ding and Liu (2019) support the Leviathan hypothesis, while other studies including Stein (1999), Martínez-Vázquez and Yao (2009), Cassette and Paty (2010), Baskaran (2011), Kwon (2013), Jia, Guo and Zhang (2014) reject this hypothesis. In other words, some studies empirically support the argument that fiscal decentralization would lead to a reduction in the government size while others do not. This implies that using more composite indexes does not necessarily resolve the disagreement. The rejection of the Leviathan hypothesis might be associated with transfer dependency (Stein, 1999), common pool problem (Baskaran, 2011; Jia, Guo and Zhang, 2014) and corruption (Martínez-Vázquez and Yao, 2009).

Failure to find a strong or decisive negative relationship between fiscal decentralization and government size in the empirical studies supports the emergence of Local Leviathan in the literature (Josselin, 1995; Craw, 2008). We should note that, despite a rich literature on the relationship between fiscal decentralization and general government size, there are relatively few empirical studies examining the impact of decentralization on local government size (Jin and Zou, 2002; Cassette and Paty, 2010; Liberati and Sacchi, 2013; Jia, Guo and Zhang, 2014; Sacchi and Salotti, 2017). Using tax or revenue autonomy for fiscal decentralization some studies like Liberati and Sacchi (2013), Boetti, Piacenza and Turati (2012) found a negative impact on the local government size, while other studies including Jin and Zou (2002), Jia, Guo and Zhang (2014) did not. On the other hand, using the expenditure autonomy, Jin and Zou (2002), Kwon (2003), Jia, Guo and Zhang (2014) and Zhang (2016) report a positive relationship between fiscal decentralization and the local government size. Apart from these studies, Boetti, Piacenza and Turati (2012) confirm the Local Leviathan

hypothesis by using the Akai and Sakata (2002) composite index. Moreover, using fiscal inequalities or transfers as a measure for fiscal decentralization some empirical studies (among them Jin and Zou, 2002; Borge and Rattso, 2002; Liberati and Sacchi, 2013; Jia, Guo and Zhang, 2014; Sacchi and Salotti, 2017; Cassette and Paty, 2010; Jia, Martínez-Vázquez and Zhang, 2021) found a positive effect on the size of the local government. This positive relationship is supported by transfer dependency (Liberati and Sacchi, 2013), common pool problem (Borge and Rattso, 2002; Jia, Guo and Zhang 2014; Sacchi and Salotti, 2017) and tax effort (Jia, Martínez-Vázquez and Zhang, 2021).

We conclude that despite a considerable empirical attention to the effects of fiscal decentralization on the general and local government size, there is yet no consensus. However, this is hardly surprising. Different fiscal decentralization indexes, sample countries and periods, and even econometric methods would naturally lead to different or even conflicting results. Nonetheless, we should highlight two important points. First, making a distinction among different fiscal decentralization measures would matter. Second, there exists a clear difference between general and local governments regarding the effects of fiscal decentralization, consistent with theoretical explanations. Common fiscal decentralization indexes such as revenue or expenditure indexes (basic indexes) tend to over-estimate (Stegarescu, 2005; Cassette and Paty, 2010).

### 3. Data and model specification

Following some studies such as Liberati and Sacchi (2013) and Makreshanska-Mladenovska and Petrevski (2019), we test the validity of two hypotheses, namely the Leviathan hypothesis (general government – GG) and the Local Leviathan hypothesis (local government – LG). We can write our baseline empirical specification as follows:

$$G_{it} = \beta_0 + \beta_1 G_{it-1} + \beta_2 FD_{it} + \beta_3 X_{it} + \epsilon_{it} \quad (1)$$

where is the dependent variable, which is government size for  $i$  country at the end of year  $t$  (GG or LG),  $G_{it-1}$  is the lagged value of dependent variable,  $FD$  stands for fiscal decentralization index,  $X$  is a vector of control variables,  $\beta_3$  is a vector of explanatory variables and  $\epsilon_{it}$  is error term. Lagged explanatory variables are widely used in public economics in response to endogeneity concerns (Bellemare, Masaki and Pepinsky, 2017). At the theoretical level, public budgets are generally not created each year independently from other years' budgets, even in the process of budget preparation, they are related to budgets of the previous years. For this reason, we include the lagged dependent variable in the model.

We calculate a composite index of fiscal decentralization developed by Vo (2008) that considers the expenditure decisions, taxing powers, fiscal transfers and subnational borrowings. Besides, it is possible to calculate this index using the IMF's GFS data. This composite index is based on two important indicators: fiscal importance

and fiscal autonomy. Fiscal autonomy (FA) is expressed as the ratio of local governments' own revenues (OSR) to local governments' expenditures (E).

$$FA = \frac{\sum_{i=1}^P OSR_i}{\sum_{i=1}^P E_i} \quad (2)$$

$OSR_i$  and  $E_i$  represent the local government's own revenues and expenditures of  $i$  regions. The fiscal importance index can be expressed as an indicator of the efficiency:

$$FI = \frac{\sum_{i=1}^P E_i}{TE} \quad (3)$$

TE refers to the government's total public sector expenditure (i.e., the sum of central and local government expenditures), excluding fiscal transfers from one government level to another. We calculate FD as the geometric mean of fiscal autonomy and fiscal importance indicators:

$$FD = (FA \times FI)^{1/2} \sqrt{\left(\frac{\sum_{i=1}^P OSR_i}{\sum_{i=1}^P E_i}\right) \times \left(\frac{\sum_{i=1}^P E_i}{TE}\right)} \quad (4)$$

To gain additional insights and check the sensitivity of the results, we also use basic and other composite indexes frequently employed in empirical studies. We employ two basic indexes of fiscal decentralization. In this context, we define the expenditure autonomy (BAS1) as the ratio of local government expenditures to total public expenditures (Wallis and Oates, 1988; Davoodi and Zou, 1998). Similarly, we define revenue autonomy (BAS2) as the ratio of local governments' own revenues to their total revenues (Stegarescu, 2005; Eyraud and Lusinyan, 2011).

In addition to these basic indexes, we employ two composite indexes developed by Akai and Sakata (2002) and Martínez-Vázquez and Timofeev (2010) to supplement our estimations. Akai and Sakata (2002, pp. 96–98) measure fiscal decentralization with the production-revenue indicator (COM1). The revenue (production) indicator refers to the share of local government revenues (expenditures) in total budget revenue (expenditure); the index combines a geometric average of the two indicators. Secondly, Martínez-Vázquez and Timofeev (2010) suggest a composite index based on expenditure autonomy and revenue autonomy; this index (COM2) is defined as the ratio of revenue autonomy to expenditure centralization (i.e.,  $1 - \text{Expenditure ratio}$ ).

Following the literature, we include many control variables: per capita GDP growth (GDP), general public debt (DEBT), inflation (INF), urban population to total population (URBAN), trade openness (TRADE), population aged 65 and over to the total population (ELDER), local democracy (LD) and annual population growth rate (POP). It is expected that GDP (Rodden, 2003; Wu and Lin, 2012), INF (Olivera, 1969) and LD (Asatryan, 2016; Matsusaka, 2017) will have a positive effect on LG and GG. On the other hand, we expect that other control variables will have different signs or effects on LG and GG. It is assumed that ELDER (Arvate, 2011), POP (Sow and Razafimahefa,

2015) and TRADE (Rodrik, 1998) have a positive effect on general government, but an insignificant effect on local government. Lastly, we assume that DEBT and URBAN have an uncertain effect on GG and LG (Bordignon, 2004; Makreshanska-Mladenovska and Petrevski, 2019). We employ unbalanced panel data with 5-year non-overlapping averages for the period 1972–2019 for a sample of 36 countries. The data availability dictates our sample countries and periods for which we can calculate the aforementioned fiscal decentralization indexes. The variables, definitions and data sources are summarized in Table 1.

**Table 1:** Variables, definitions and data source

Variable	Definitions	Source
<b><i>Leviathan and Local Leviathan Hypothesis Dependent Variables</i></b>		
LG	Local Government Expenditures / GDP	IMF Database
GG	General Government Expenditures / GDP	IMF Database
<b><i>Independent Variable</i></b>		
FD	Fiscal Decentralization Index	Calculated by authors
<b><i>Control Variable</i></b>		
GDP	GDP per capita growth (% annual)	World Bank Database
INF	Consumer prices (% annual)	World Bank Database
DEBT	General public debt (% GDP)	World Bank Database
POP	Population growth rate (% annual)	World Bank Database
ELDER	65+ Population / Total Population	World Bank Database
URBAN	Urban Population / Total Population	World Bank Database
TRADE	Trade openness (% of GDP)	World Bank Database
LD	Local Democracy Index	World Bank Database

\* Used for robustness testing; BAS1, BAS2 represent basic indexes, and COM1, COM2 stands for the composite indexes.

\*\*TR and TAX represent transfer dependency and tax autonomy, respectively. These variables are calculated by authors for all countries, taking into account the calculations of Eyraud and Lusinyan (2013) and Fiva (2006), respectively. TR is measured as the ratio of net transfer to subnational own spending while TAX is measured as the ratio of local tax revenue to general tax revenue.

**Source:** Authors' research results

Since we include the lagged value of the dependent variable in our empirical specification, we employ the General Method of Moments (GMM), developed by Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998); GMM method has some well-known advantages to deal with some common and important econometric problems such as endogeneity, autocorrelation, and heteroscedasticity (Roodman, 2009). To avoid the instrument proliferation problem, the number of instruments should be equal to or less than the number of groups (Roodman, 2009). We employ Hansen's J test to validate of instruments as suggested by Baum, Schaffer and Stillman (2007). We also use AR tests to test for autocorrelation as suggested by Arellano and Bond (1991).

#### 4. Empirical results

We report our baseline regression results in Table 2. Before interpreting our results, we should note that no autocorrelation and overidentification problems exist in our estimates. There is a positive but insignificant relationship between FD and GG. This suggests that fiscal decentralization does not lead to a reduction in the government size, implying the rejection of the Leviathan hypothesis. Note that our result is consistent with that of many previous studies (Oates, 1985; Heil, 1991; Grossman, 1992). On the other hand, there is a statistically significant and positive relationship at the 1% level between FD and LG, lending strong evidence for the existence of Local Leviathan (Jin and Zou, 2002; Kwon, 2003; Kwon, 2013; Sacchi and Salotti, 2017). In other words, our results support the argument that fiscal decentralization leads to an increase in local government size. Indeed, local governments would prefer expansionary policies as ‘expenditure competition’ (Rodden, 2003; Jia, Guo and Zhang, 2014; Zhang, 2016) instead of a ‘race to bottom’ approach. We think that this result is plausible. If a central government transfers the provision of some public goods or responsibilities to the local governments then it is possible to observe an expansion in the local government size.

**Table 2:** Baseline regression:  
Effect of fiscal decentralization (FD) on public sector size at local (LG) and general levels (GG)

	GG	LG
L.GG / L.LG	0.24***	0.211***
FD	1.38	7.89**
GDP	-0.839***	-0.191**
DEBT	-1.9e-12	5.2e-13
INF	0.123**	0.0156
TRADE	0.0259	0.00893
POP	0.0468*	0.0133
URBAN	0.0271	0.125*
LD	5.19	11.2***
ELDER	0.688*	0.476
<b>Diagnostic Tests</b>		
Obs.	201	207
Group-Instrument	34-34	34-34
AR1	0.129	0.592
AR2	0.164	0.316
Hansen	17.4 (0.233)	12.6 (0.556)

The model includes time dummies but not constant terms. t statistics are represented by \*\*\*, \*\*, \* and state the significance at the level of 1%, 5 and 10%, respectively.

**Source:** Authors’ research results

We should add that the lagged dependent variable has a statistically significant effect, supporting the dynamic specification. It seems that GDP exerts a negative impact on the general and local government. Therefore, our results suggest that income elasticity of government provided goods and services is not greater than 1. Apart from these findings, INF, POP and ELDER have a positive effect on GG, whereas LD and URBAN exert a positive effect on LG. Our results are in line with previous studies such as Olivera (1969), Arvate (2011) and Asatryan (2016).

Since general governments mainly meet the public goods and service demands of the elderly population (social expenditures, social security services, pension payments and health services) a positive coefficient on ELDER for GG is consistent with our priori expectations (Arvate, 2011). Another important finding is that LD and URBAN exert a positive impact on LG. Voters at the local level would put more electoral pressure on politicians, leading to an increase in the public expenditures. Moreover, it seems that democracy does not function as a restriction against the Leviathan government. Our findings are in line with that of some previous studies (Asatryan, 2016).

To supplement our baseline regressions, we estimate alternative specifications with different fiscal decentralization indexes (BAS1, BAS2, COM1 and COM2) in Table 3. Similar to our previous results, there does not exist a significant relationship between fiscal decentralization indexes and GG, indicating the absence of Leviathan. On the other hand, all alternative fiscal decentralization indexes (BAS 1, BAS2, COM1 and COM2) have a significantly positive impact on the local government size. Therefore, we conclude that our results robustly and consistently support the Local Leviathan hypothesis. Importantly, this clearly indicates that our baseline results are not sensitive to the choice of fiscal decentralization indexes used in the empirical analysis.

Furthermore, to gain additional insight we estimate our specifications with two extensions. In the first, we use the fiscal autonomy (FA) and fiscal importance (FI) sub-indexes instead of the fiscal decentralization index of Vo (2008). In the second extension, we add the transfer dependency (TR) and tax autonomy (TAX) to the model. Table 4 reports the results of these extended specifications. It seems that there is a significant and positive impact of FA on GG while FI has a positive effect on LG. We think that at least two reasons would explain the relationship between the FA and GG (Oulasvirta and Turala, 2009). First, local governments would have fiscal autonomy but not spending autonomy. In other words, local governments could not have the right or power to determine or change the expenditure policy because of legislation. As a result, public goods are provided by the general government. Second, a strong fiscal autonomy creates some socio-economic problems due to the absence of good governance and democracy. Conversely, FI creates a pressure to spend more at local level (Rodden, 2003; Jia, Guo and Zhang, 2014; Zhang, 2016). This could lead to an increase in the local government size.

**Table 3: Robustness test: Alternative fiscal decentralization indexes**

	GG				LG			
	BAS1	BAS2	COM1	COM2	BAS1	BAS2	COM1	COM2
L.GG / L.LG	.168	.231***	.211***	.127	.304***	.0881	.129	.267***
Indexes	8.76	-11.4	-6.61	-0.344	15.6***	32.5***	31.9***	5.11***
GDP	-.81***	-.844***	-.785***	-.762***	-.127	-.131	-.104	-.15
DEBT	-3.8e-12	-3.8e-13	-1.6e-12	-4.2e-12	1.1e-13	4.7e-14	-1.3e-13	2.5e-12
INF	.121*	.126**	.13**	.158***	.0179	.0208**	.0219*	-.00665
TRADE	.0321*	.016	.0204	.0312	.00897	.0241*	.0213	.0134
POP	.053	.0462	.0444	.043	.0233	.0117	.00871	.0214
URBAN	-.0257	.086	.0473	.0434	.0947	.0559	.0626*	.102**
LD	.053	8.5	8.09	8.37	9.32*	8.14*	6.68	11.5***
ELDER	.617	.834	.657	.682	.473*	.436*	.487***	.477
<b>Diagnostic Tests</b>								
Obs.	199	201	199	191	207	207	205	199
G-I	34-34	34-34	34-34	34-34	34-34	34-34	34-34	34-34
AR1	.302	.149	.188	.482	.441	.8	.517	.49
AR2	.226	.40	.295	.372	.291	.592	.862	.667
Hansen	.206	.150	.238	.339	.365	.229	.263	.333
	(18)	(19.4)	(17.3)	(15.6)	(15.2)	(17.5)	(16.9)	(15.7)

Note: See the note in Table 2.

Source: Authors' research results

**Table 4:** Extended specification: Sub-fiscal decentralization indexes

	GG	GG	LG	LG
L.GG / L.LG	.337***	.305***	.240**	.287*
FD		5.74		20.6**
TR		-2.35*		2.8**
TAX		-18.9		2.39
FA	6.05*		1.09	
FI	-1.23		17.2***	
GDP	-.789***	-.815***	-.131*	-.196*
DEBT	-2.2e-12	-2.8e-12	3.2e-13	1.8e-12
INF	.134*	.116**	.0218	.025*
TRADE	.00953	.00983	.0181*	.03
POP	.0487	.0952**	0.14	-.0443
URBAN	.0169	.0757	.0586*	.0517
LD	4.85	13.5**	9.77**	4.54
ELDER	.622	.851***	.498*	.59**
<b>Diagnostic Tests</b>				
Obs.	201	200	207	206
Group-Instrument	34-38	31-34	34-38	31-34
AR1	0.0594	0.149	0.9	0.86
AR2	0.141	0.294	0.798	0.299
Hansen	0.443 (17.2)	0.331 (15.7)	0.489 (16.5)	0.19 (18.4)

Note: See the note in Table 2.

**Source:** Authors' research results

On the other hand, when we include the transfer dependency and tax autonomy as additional controls to the model, we do not find a statistically significant relationship between the FD and GG. This result confirms the absence of the Leviathan once again. In addition, there is a statistically significant and negative relationship between TR and GG. This particular result shows that although central governments would offer some fiscal transfers and incentives to the local governments, they might lower their own expenditure (Bordignon, 2004). From this point of view, transfer dependency can create a contractionary effect at the general government level, but this effect is not associated with hard budget constraints. Local governments would tend to overspend due to revenues from fiscal transfers, incentives and common pool (Stein, 1999; Cassette and Patty, 2010; Sacchi and Salotti 2017) instead of their own revenues. These effects create an expansionary expenditure policy at local level.

In the second extended specification, we find a positive and significant relationship between FD and LG, confirming the validity of the Local Leviathan hypothesis. Furthermore, there is a statistically significant and positive relationship between TR

and LG. This indicates that transfer dependency would affect the size of local government based on expenditure competition and flypaper effect. Local governments use transfers from the central government to expand their budgets (Gramlich *et al.*, 1973). This implies that transfers received by local governments tend to ‘stick where it hits’ (Hines and Thaler, 1995).

## 5. Conclusion

Using Vo’s (2008) fiscal decentralization index for 36 countries and system GMM, we examine both Local Leviathan and Leviathan hypothesis. Our results firmly reject the validity of the Leviathan hypothesis, consistent with previous studies such as Oates (1985), Heil (1991), Grossman (1992). On the other hand, we find robust evidence for the presence of the Local Leviathan hypothesis as suggested by Rodden (2003), Kwon (2003) and Kwon (2013). In other words, it seems that fiscal decentralization is not associated with a reduction in general government size while it leads to an increase in local government size. Contrary to what is stated in theory, there is an ‘expenditure competition’ (Rodden, 2003), as opposed to a ‘race to the bottom’ (Brennan and Buchanan, 1980; Weingast 1995). We find similar results when we employ alternative measures for fiscal decentralization.

Moreover, we extend our baseline specification to check the robustness of our results. It seems that an increase in transfer dependency creates a flypaper effect in local governments while a negative effect is detected at general government level. This indicates that even though central governments follow a low expenditure policy (Bordignon, 2004), local governments could easily spend fiscal transfers and incentives received from the central government than local own-source revenue (Stein, 1999; Cassette and Patty, 2010; Sacchi and Salotti 2017). Furthermore, the relationship between the tax autonomy and LG is positive and significant, while a negative effect exists on GG. In the other specifications, there is a statistically significant and positive relationship between FI and LG, whereas a significant and positive relationship exists between FA and GG.

Finally, this study clearly demonstrates that fiscal decentralization is not a solution to control the expansion of the general government size. Rather, it seems that fiscal decentralization is consistently associated with an increase in local government size. This positive relationship between the local government size and fiscal decentralization suggests that the existence of a race to bottom effect is rejected. On the other hand, our study does not focus on whether fiscal decentralization would be associated with an increase in the economic efficiency or better provision of public goods. This would be an interesting research question for future studies. In this context, it is possible to test the relationship between fiscal decentralization and government efficiency. More specifically, do countries with a higher fiscal decentralization have more efficient governments as well? Similarly, it would be a worthwhile effort to determine whether increased local expenditure is related to welfare policies proposed

in fiscal decentralization theory. We think that it would be interesting to examine the effects of fiscal decentralization on the composition of general and local government expenditures in the same framework.

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## Annex 1: Summary of literature review

Study	Index of Fiscal Decentralization	Sample (time and location)	Main result
Oates (1985)	Expenditure decentralization Revenue decentralization	1982 43 countries	No significant relation between fiscal decentralization and general government size.
Wallis and Oates (1988)	Expenditure decentralization Revenue decentralization	1902–1982 48 US states	There is no systematic relation between fiscal decentralization and government size.
Forbes and Zampelli (1989)	The number of competing governmental jurisdictions	1977 345 countries in 157 SMSAs	An increase in the number of competing governmental jurisdictions encourages smaller government size.
Grossman (1989)	Expenditure decentralization	1946–1986 United States	Expenditure decentralization has a constraining effect on revenue maximization at general government size.
Heil (1991)	Expenditure decentralization Revenue decentralization	1985 22 OECD – 39 IMF countries	There is no significant relation between decentralization and general government size.
Joufaian and Marlow (1991)	Expenditure decentralization Number of local governments Government competitive degree	1983, 1984 and 1985 United States	Fiscal decentralization negatively impacts the government size whereas no relation was detected between government size and the degree of centralization at local and state level.
Grossman (1992)	Expenditure decentralization Revenue decentralization	1950–1984 Australia	Fiscal decentralization has no impact on public sector size in Australia.
Ehdaie (1994)	Ratio of total subnational governments own-source revenues over total national-subnational government expenditures	1977–1987 30 countries	Taxing and spending powers have negative effects on size of general government. A negative relation exists between the revenue sharing with taxing decisions and decentralization of the spending power.
Stein (1999)	Expenditure decentralization Vertical fiscal imbalance	1997 19 countries in Latin America and the Caribbean	Degree of expenditure decentralization encourages larger government size due to vertical fiscal imbalance.
Moesen and van Cauwenberge (2000)	As a ratio of local government expenditure (excluding transfers received) to total government expenditure	1990–1992 19 OECD countries	A negative effect between expenditure decentralization and general government size is found.
Jin and Zou (2002)	Expenditure decentralization Revenue decentralization Vertical fiscal imbalance	1980–1994 32 industrial and developing countries	Expenditure decentralization leads to larger general and subnational governments, and smaller national governments, while revenue decentralization causes larger subnational governments. Vertical imbalance has an increasing effect on the sizes of public sector at all levels.

Study	Index of Fiscal Decentralization	Sample (time and location)	Main result
Borge and Rattso (2002)	Vertical fiscal imbalance	1880–1990 Norway	An asymmetry between decentralized spending and centralized financing exists, creating a larger government size.
Kwon (2003)	Expenditure decentralization Intergovernmental grants	1979–2001 Central and local levels of the Korean government	Fiscal decentralization exerts a negative (positive) impact on the level of central (local) government expenditure.
Rodden (2003)	Central revenue/Total revenue; own source revenue/total revenue; grants/total revenue	1978–1997 44 countries	Fiscal decentralization negatively (positively) impacts the level of general and central (local) government expenditure.
Fiva (2006)	Expenditure decentralization Tax revenue decentralization	1970–2000 18 OECD countries	A negative (positive) relation between revenue (expenditure) decentralization and general government size.
Prohl and Schneider (2009)	Expenditure decentralization Revenue decentralization Arzaghi and Henderson (2002) composite index	1978–2003 29 countries	A negative relation is found between fiscal decentralization and public expenditure level and tax burden.
Martínez-Vázquez and Yao (2009)	Expenditure decentralization Revenue decentralization	1985–2005 74 countries	Fiscal decentralization causes a positive effect on public sector employments.
Cassette and Paty (2010)	Revenue decentralization Vertical imbalance	1972–2004 15 EU countries	Tax autonomy reduces central government size while it increases local and total government size. Vertical imbalances increase the government size at all levels.
Baskaran (2011)	Expenditure decentralization Revenue decentralization	1980–2004 18 OECD countries	A positive influence between fiscal decentralization and general government size is reported.
Kwon (2013)	Expenditure decentralization Own source revenue decentralization Tax revenue decentralization	Among 1998, 2000, 2002, 2004, 2006 and 2008 17 developed and 17 developing states	Devolution of responsibility for expenditure and revenue leads to larger government size both in developed and developing countries.
Liberati and Sacchi (2013)	Tax decentralization Vertical imbalance	1980–2004 19 OECD countries	Tax decentralization has a negative effect on local government size, but it does not limit the size of local governments. Intergovernmental transfers have a positive influence on the size of the local government.
Boetti, Piacenza and Turati (2012)	Fiscal autonomy (Akai and Sakata, 2002) Tax decentralization Vertical imbalance	262 municipalities in Italy	More autonomous municipalities prefer less inefficient behaviors.

Jia, Guo and Zhang (2014)	Expenditure decentralization Revenue decentralization Vertical fiscal imbalance	1997–2006 China	A positive (weak) effect between expenditure (revenue) decentralization and local government size is reported.  Fiscal decentralization in China has a positive impact on the local government size due to the lack of fiscal autonomy and institutional factors. A positive effect of revenue and expenditure decentralization on local government size is detected. Some regional differences exist.
Zhang (2016)	Expenditure decentralization Revenue decentralization	1985 and 2010 31 provinces in China	The volatility of intergovernmental grants has a positive effect on the volatility of local expenditure. Local governments rely more on grants and incentives than own tax revenues, and it affects their spending stability. Expenditure decentralization negatively impacts the general government size.
Sacchi and Salotti (2017)	Volatility of the various types of local revenues Intergovernmental grants	1972–2019 20 OECD countries	Expenditure decentralization is related to smaller government size. Revenue decentralization is related to smaller government size only in the sub-sample of Central and Eastern European countries.
Herwartz and Theilen (2017)	Expenditure decentralization	1995–2013 23 OECD countries	Fiscal decentralization is associated with smaller government size. A higher level of democracy tends to decrease negative effect of fiscal decentralization.
Makreshanska-Mladenovska and Petrevski (2019)	Expenditure decentralization Revenue decentralization	1990–2016 28 European countries	Fiscal decentralization negatively affects the fiscal indiscipline via a reduction in the tax effort of local governments.
Qiao, Ding and Liu (2019)	Expenditure decentralization Revenue decentralization Own tax decentralization by Stegarescu (2005) Regional authority by Hooghe et al. (2016)	1972–2013 76 developed and developing countries	
Jia, Martínez-Vázquez and Zhang (2021)	Vertical fiscal imbalance	1999–2009 China	

**Source:** Authors' research results