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On the Measurement and Impact of Fiscal Decentralization

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Abstract

The typical post-Bretton Woods era development approach that emphasized central government-led development efforts has changed dramatically, and local governments have clearly emerged as players in development policy. The thinking about what is important to achieve in development objectives is changing as fiscal decentralization reforms are being pursued by many countries around the world. In this context, a number of studies have attempted to quantify the impact of decentralization by relating some measure of it to economic outcomes of fiscal stability, economic growth, and public sector size. But decentralization is surprisingly difficult to measure. Nearly all cases examining the relationship between decentralization and macroeconomic performance have relied on the Government Finance Statistics (GFS) of the International Monetary Fund. However, despite its merits, GFS falls short in providing a full picture of fiscal decentralization. For some countries, however, there is data that more accurately captures fiscal responsibilities among different types of governments.

This paper—a product of the Economic Policy and Poverty Reduction Division, World Bank Institute—is part of a larger effort in the institute to serve as a knowledge center and as a partner to achieve poverty reduction in developing and transition countries. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Michelle Morris, mail stop J4-403, telephone 202-473-7285, fax 202-676-9810, email address fiscal_decentralization@worldbank.org. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. The authors may be contacted at rebel@worldbank.org or syilmaz@worldbank.org. March 2002. (26 pages)

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ON THE MEASUREMENT AND IMPACT OF FISCAL DECENTRALIZATION

by

Robert D. Ebel and Serdar Yilmaz[1]

INTRODUCTION: SCOPE AND PURPOSE

For much of the post-Bretton Woods era, the typical development approach emphasized central government plans and programs. The thinking was that if a poor country could come up with a national plan for generating and investing a sufficient amount of funds in a manner consistent with macro-stability, then that country would have met the pre-conditions for development. It would be a state-led (central government) strategy whereby the "flexibility to implement polices devised by technocrats was accorded a pride of place, and accountability through checks and balances was regarded as an encumbrance."[2] Until perhaps the mid 1990s, this was the main message of not only the two Bretton Woods institutions—International Monetary Fund and World Bank—but also of other multilaterals and many bilaterals.

It was not an unreasonable strategy. Bretton Woods reflected a world emerging from the ravages of war, when much of the developing world was gaining its political independence. Development seemed a surmountable and largely technical challenge: good advisors would devise good policies, and technically assisted and institutionally capable governments would implement those policies.[3] There could even be stages, from the first "mission" to an "exit strategy"—words that reveal so well the thinking of the time.

There was some progress, especially in infant mortality rates, life expectancy, and adult literacy. There were also many failures.[4] The failures were not just about an inability to demonstrate sustained growth rates. They were also about environmental deterioration, loss of civil liberties, corruption, and a very poor record of delivering "local" public services—clean water, sanitation, education, health, housing, safety nets, and, as some argue, poverty alleviation.[5] These were failures in an era when the scope of central government expanding enormously.[6]

Now, the thinking about what is important to achieve development objectives is changing, dramatically so in some countries. Writing in 1994, Dillinger reported (in what has become one of the most quoted World Bank reports) that of the 75 developing countries with populations greater than 5 million, all but 12 claimed to be embarked on some form of transfer of fiscal authority from central to local governments. This transfer of power has been occurring even in "inherently centralized"

countries, such as the Kingdoms of Jordan and Morocco (Ebel, Fox and Melhem, 1995; Vaillancourt, 1997; World Bank, 1999), Central and Eastern Europe states that were under the Soviet-type fiscal system (Dunn and Wetzel, 2000; Bird, Ebel and Wallich, 1995), the People's Republic of China (Wong, 1997), military regimes like Pakistan (Shah, 1996; Pakistan NRB, 2001), countries like Thailand that view decentralization as an efficiency strategy for improving local service delivery in reaction to financial crises (World Bank, 2000); nation-states that are trying to avoid the centrifugal forces of separatism, like Russia (Wallich, 1994; and Martinez-Vazquez and Boex, 2001) and Indonesia (Ahmad and Hofman, 2001; Bird et al., 2001), and Latin America, where participatory budgeting is taking hold (Stein, 1997; Burki, Perry and Dillinger, 1999).

The World Bank is very explicit on the importance of all this: the World Development Report on *Entering the 21st Century* notes that along with globalization (continuing integration of countries worldwide), localization—the desire for self-determination and the devolution of power—is the main force "shaping the world in which development will be defined and implemented" in the first decade of this century. The report argues that these "defining forces of globalization and localization," which at first glance may seem countervailing, often stem from the same factors and reinforce one another (WDR, 1999/2000).

The theme that emerges is that "good governance" matters, where "governance" is about how people determine collectively which services should be delivered by which government, and do so by establishing a set of transparent and competent public institutions they can understand and control. It is a theme that is tied to "getting right" what Bird refers to as the fundamental questions of intergovernmental finance: Who does what? Who levies which taxes (and is there a place for borrowing)? How can the resulting imbalances be resolved? What is the institutional framework to deal with the technical and political problems of decentralization?[7]

Within this context a number of studies attempted to quantify the impacts of decentralization by relating some measure of decentralization to the economic outcomes of fiscal stability, economic growth, and public sector size (Davoodi and Zou, 1998; deMello, 2000; Ehdaie, 1994; Fukasaku and deMello, 1998, Oates,1985).[8] Nearly all of these studies draw on Government Finance Statistics (GFS) issued by the

International Monetary Fund as the basis for measuring "decentralization."

As emphasized by Bird (2000), however, measurement is surprisingly difficult. And, if one cannot be confident of measuring the independent variable, then one cannot state with much confidence that decentralization is associated with one or more outcomes.

The purpose of this paper is to take a critical look at the nature and implications of measuring the fiscal dimension of decentralization. Recognizing that "a curious combination of strong preconceived beliefs and limited empirical evidence" characterizes all too much of the discussion (Litvack et al., 1998; Bird, 2000), we look at two policy issues: (1) the extent to which fiscal decentralization is occurring and (2) the fragility of estimation results depending on how one measures fiscal decentralization (and, therefore, the danger in drawing sweeping conclusions that often have important policy implications).

We start with GFS, but supplement this measure with other considerations that recognize more fully subnational autonomy and discretion in expenditure and taxation arrangements. We find substantial differences between GFS indicators and those that capture more accurately fiscal responsibilities among different types of government. We estimate the impact of these various measures of decentralization on economic stability, economic growth, and public sector size. Not surprisingly, we find that the different indicators have markedly different effects on economic performance.

THE FRAMEWORK FOR MEASUREMENT

The conceptual framework of fiscal decentralization is well established, drawing largely on the contributions by Stigler, Musgrave, Oates, and Buchanan. Here is the core logic: to care about growth and poverty issues, one should be concerned about efficiency–supplying services up to the point at which, at the margin, the welfare benefit to society matches its cost. In the private sector, the market-price system is the mechanism. When the market fails in this objective, there is a case for the public commandeering of resources to supply the activity. Once

the public sector intervenes, the efficiency logic is in favor of some form of fiscal decentralization. The argument is that spatial considerations make subnational governments necessary conduits for setting up a system of budgets that best approximates the efficient solution of equating benefits and costs. This leads to the decentralization theorem: The governments closest to the citizens can adjust budgets (costs) to local preferences in a manner that best leads to the delivery of a bundle of public services that is responsive to community preferences. Subnational governments thus become agencies that provide services to identifiable recipients up to the point at which the value placed on the last (marginal) amount of services for which recipients are willing to pay is just equal to the benefit they receive.[9] To implement this, subnational (local) governments must be given the authority to exercise "own-source" taxation at the margin and be in a financial position to do so. This is the essence of decentralization.

How, in practice, does one say that a country is decentralizing? While there is no set of prescribed rules, we draw on Bahl and others to identify 11 characteristics, which range from the requirement for open local elections to the fundamental "essence" question of whether subnational governments have (at least) tax rate-setting authority over locally assigned revenues (Bahl, 1999). A checklist for six transition countries (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland) serves to explain our selection of countries that we can point to as politically "decentralized" for the purposes of making some statements about whether decentralization matters in terms of its promised benefits.[10] We also have access to new data that goes directly to the point of own-source financial autonomy (OECD, 2001).

EMPIRICAL DISCUSSION

The literature on the relationship between decentralization and different macro indicators is growing. Most of these studies are cross-country analyses using the Government Finance Statistics (GFS) of the International Monetary Fund, and all describe the degree of fiscal decentralization as the subnational share of total government spending/revenue or of Gross Domestic Product (GDP).[11]

Comparing the degree of fiscal decentralization across countries is a complex task that requires identification of subnational autonomy and discretion on expenditure and revenue arrangements. Although it is widely accepted that subnational share of total government spending/revenue is an imperfect measure of fiscal decentralization and that the need to standardize the fiscal variables in GFS inevitably eliminates details about the design of fiscal systems, many researchers use these measures to represent the degree of fiscal decentralization.

What are We Trying to Analyze?

Recognizing that GFS has served well as a product of the central government forces of the post-Bretton Woods development model, three major problems emerge when using the data in an empirical study on fiscal decentralization:

> First, although GFS provides a breakdown of expenditures by function and economic type, it does not identify the degree of local expenditure autonomy. Thus, local expenditures that are mandated by the central government or are spent on behalf of central government appear as subnational expenditure.[12]
>
> Second, GFS does not distinguish the sources of tax and non-tax revenues, intergovernmental transfers, and other grants. Hence, there is no information on whether revenues are collected through shared taxes, piggybacked taxes, or locally determined "own-source" revenues.
>
> Third, GFS does not disclose what proportion of intergovernmental transfers is conditional as opposed to general-purpose, and whether transfers are distributed according to an objective criteria or a discretionary measure. We will argue that this

distinction between conditional/objective formula grants versus more centrally tied "discretionary"/specific purpose grants can be a useful variable as a country makes the transition from deconcentration to devolution.

These aggregation problems limit the use of subnational statistics in the GFS data set. Thus, although GFS has consistent definitions across countries and over time, the subnational expenditure and revenue figures have little relevance in the decentralization context because the data fail to address properly the intergovernmental fiscal structure of countries and ignore the degree of central government control over local tax rates and tax bases. Thus, with GFS, the subnational revenue and expenditure share in total government revenue/spending ends up being an overestimate of fiscal decentralization.

This overestimation of the fiscal decentralization indicator can be illustrated by analyzing the revenue structure of subnational governments. Until recently, such a comparison was impossible due to lack of data that were both disaggregated and fit what we identified above as the essence of public sector decentralization—the ability of local governments to set the tax rate at the margin. Such data is available now for a set of EU-accession countries from the Organisation for Economic Cooperation and Development's survey *Fiscal Design Across Levels of Government* (OECD, 2001).[13]

OECD identifies three sources of subnational revenues—tax revenues, non-tax revenues, and intergovernmental grants—for the Czech Republic, Estonia, Hungary, Latvia, Lithuania, and Poland (Table 1). Tax revenues and intergovernmental grants are further divided into two groups. If subnational governments have total or significant control over a tax as defined by an "own" control over tax rate or a revenue tax base and rate, this is listed as "own tax revenue." If subnational governments have limited or no control over the rate and base of a tax and the central government determines how to split revenues, it is listed as "revenues from tax sharing."[14] Non-tax revenues include income from business operations and property, administrative fees and duties, and fines.

Table 1: **Comparison of GFS Data with Fiscal Design Survey of OECD (1999)**

Country	GFS[1]	Expenditure Share[2]	Revenue Share[2]	Composition of Subnational Revenues					
				Tax Revenue		Non-tax Revenue[5]	Grant		Total
				Own-Taxes[3]	*Tax-Sharing[4]*		*General-Purpose[6]*	*Specific[7]*	
Czech Republic	21.0	18.3	20.8	3.9	43.8	36.3	0	16.0	100
Hungary	23.0	23.7	26.7	16.3	16.8	17.0	1.7	48.2	100
Poland	31.0	27.6	28.8	10.6	14.4	24.6	30.5	19.9	100
Estonia	21.0	19.7	22.1	6.3	62.1	9.1	13.4	9.1	100
Latvia	24.0	23.1	25.0	0	66.2	14.1	5.8	13.9	100
Lithuania	20.0	19.6	22.8	0	91.0	4.8	2.3	1.9	100

[1] Subnational expenditures in total government expenditure.

[2] As reported in OECD, 2001.

[3] Subnational government sets tax rate and/or tax base.

[4] Central government sets tax rate and base and determines revenue-split.

[5] Revenues, such as fees and user charges, that are assessed by subnational governments.

[6] General-purpose grants are those that can be treated like own-source revenue. General-purpose grants can be distributed according to objective criteria (such as tax capacity, expenditure needs) as well as at the discretion of the central government.

[7] Specific grants are tied sources of revenue. Specific grants are given to cover certain amount of costs of a service mandated by the central government or a function that is delivered on its behalf.

Intergovernmental grants are further classified as either general purpose or specific. For expenditure purposes, general-purpose grants can be used like own revenues, but they may be allocated based on either objective criteria or the central government's discretion. Specific grants are earmarked for certain purposes, and the allocation may or may not be conditional across subnational governments. Therefore, general-purpose and specific grants are identified as separate subgroups.[15]

The first three columns of Table 1 report the aggregate figures of subnational expenditures and revenues for the six transition countries. The GFS column presents subnational governments' share in total government expenditure as used in most empirical studies. Comparison of the GFS data with the aggregates reported in the OECD study shows very little discrepancy between them. The detailed subnational revenues reported in the OECD study, however, tell a very different story.

The composition of revenues reveals that subnational governments in these six countries have very little control over their revenues. Therefore, aggregate revenue figures overrepresent the degree of fiscal decentralization. For example, in Lithuania, 91 percent of subnational governments' revenues come from shared taxes for which the central government sets the rates and bases and controls revenue split. Subnational governments in Lithuania have control over only 4.8 percent of their revenues. Thus, almost all local revenues are under the control of the central government, and the aggregate revenue (expenditure) figure grossly overrepresents the degree of fiscal decentralization. But the aggregate data tell a very different, and misleading, story (columns 2, 3 and 4).

Table 2 provides further detail on subnational own revenues in all six transition countries. In general, their subnational governments have very little revenue autonomy, especially in Baltic countries. The first column presents own revenues over which subnational governments have policy control. This control is essential for effective decentralization. Subnational governments in Czech Republic have the highest percentage share of own-source revenues (almost all are non-tax revenues), which is only 40 percent of total revenues.

Table 2: **Share of Subnational Own-Revenues in Total Revenues**

	Own-Taxes + Non-Tax Revenue	**General Purpose Grants (with objective criteria)**	**Specific Grant (not conditional)**	**Total**
Czech Rep.	40.2	0	6.5	46.7
Hungary	33.3	0.3	0.8	34.4
Poland	35.2	30.5	0	65.7
Estonia	15.4	13.4	0	28.8
Latvia	14.1	5.8	0	19.9
Lithuania	4.8	2.3	0	7.1

Source: OECD, Taxing Powers of State and Local Government (Paris, 2001, 1999).

The next two columns report intergovernmental grants. One might argue that general-purpose grants and specific grants cannot be own sources of revenue, and we recognize the merits of this view. Nevertheless, for the reasons stated above and for a limited purpose here, we risk the overestimation bias and include general-purpose grants with objective criteria and non-conditional specific grants in the decentralization variable. The argument is that subnational governments have at least expenditure autonomy over these grants. Discretionary and conditional grants that cover all or parts of services mandated by the central government are excluded. But, even with this liberal interpretation of the disaggregated subnational revenue data, the case remains strong against using aggregate revenue/expenditure figures to measure decentralization.

Cross-country studies that do not capture the variation in intergovernmental fiscal design misrepresent the degree of fiscal decentralization in some transition countries, as seen, for example, in the aggregation of revenue/expenditure figures in Table 1. In other, mostly developed countries where subnational governments have discretion over revenues and expenditures, aggregated figures might be appropriate in

representing the degree of fiscal decentralization (see Table 3, next page).[16] Table 3 shows the significant variation in degree of tax autonomy for subnational governments in developed and developing countries. Subnational governments in developing countries get a significant portion of their tax revenues from tax sharing, whereas subnational governments in developed countries either have control over tax rate and base or must approve any changes in the revenue split of shared taxes.

The Question of Macro Indicators

At first, the revenue structure of a country may seem just a detail that has no bearing on the empirical analysis. The revenue structure of subnational governments, however, has important implications for the outcome of the fiscal decentralization process (Bird, 2001, p. 9.) The coordination failures arising from an improperly designed revenue system may induce subnational governments to spend inefficiently and endanger macroeconomic stability by aggravating fiscal imbalance. A key to the success of decentralization is to design a system of multilevel public finances to provide local services effectively and efficiently while maintaining macroeconomic stability (deMello, 2000). Accountability at the margin is an important characteristic of a revenue system that fosters prudence in debt and expenditure management. It is impossible for a subnational government not to have control over revenue margins and still be fully accountable.

These points have been overlooked in most of the empirical studies. Studies using variables that misrepresent the degree of decentralization find an implausible impact of fiscal decentralization on macroeconomic stability, economic growth, and public sector size. For example, in recent cross-country studies using GFS data, deMello (2000), Davoodi and Zou (1998), and Oates (1985) analyze the impact fiscal decentralization on budget balance, economic growth, and public sector size, respectively.

DeMello (2000) looks at the impact of fiscal decentralization on budget balance, measured as the ratio of the fiscal deficit to GDP, and argues that decentralization promotes fiscal imbalance. He uses several independent variables that explain budget balance, including subnational tax autonomy (ratio of tax revenue to total subnational revenue), subnational fiscal dependency (ratio of intergovernmental transfers to total subnational revenue), and subnational spending share (ratio of

subnational government spending to total government spending). Similarly, Davoodi and Zou (1998) look at the relationship between economic growth and fiscal decentralization, measured as the subnational share of total government spending, and argue that fiscal decentralization is associated with slower economic growth. On the relationship between fiscal decentralization and total public sector size, Oates (1985) reports no supporting evidence for the "Leviathan" hypothesis.[17]

In order to explore how the fiscal decentralization variable selection affects the estimation results—and how important the selection is—we replicated the deMello, Davoodi and Zou, and Oates models using OECD data and ran the analyses for the six transition countries listed above.[18] As presented below, the estimation results with a fiscal decentralization variable that represents subnational revenue structure of subnational governments are very different from those reported for the other three models.[19]

Table 3: **Subnational Government Taxes As Percentage of Total Tax Revenue "Tax Autonomy"**

	Own Tax Revenue				**Tax Revenue Sharing**		
	SNG Sets Tax Rate and Base	*SNG Sets Tax Rate Only*	*SNG Sets Tax Base Only*	*Revenue Split May be Changed with Consent of SNG*	*Revenue Split Fixed in Legislation (May be Changed Unilaterally by the Central Government)*	*Revenue Split Determined by the Central Governmen t*	*Central Government Sets Rate and Base of SNG Tax*
Czech Rep. (95)	2.0	5.0	3.0	0	90.0	0	0
Hungary (95)	0	30	0	0	0	0	70
Poland (95)	0	45.0	1.0	0	54.0	0	0
Estonia (97)	0	9.8	0	0	90.2	0	0
Latvia (97)	0	0	0	0	0	0	100
Lithuania (97)	0	0	0	0	0	0	100
Austria (95)	5.9	6.0	0	88.1	0	0	0
Belgium (95)	5.1	49.1	0	45.3	0.4	0.2	0
Denmark (95)	0	95.2	0	0	2.7	0	2.1
Finland (95)	0.01	88.6	0	0	11.4	0	0
Germany (95)	0.3	13.2	0	86.5	0	0	0
Iceland (95)	8.0	92.0	0	0	0	0	0
Japan (95)	0.1	89.8	0	0	0	0	10.1
Mexico (95)	0	0	0	74.6	18.8	0	6.6
Netherlands (95)	0	100	0	0	0	0	0
N. Zealand (95)	98.0	0	0	0	0	0	2.0
Norway (95)	0	3.7	0	0	0.6	95.7	0
Portugal (95)	30.1	8.6	0	0	0	0	61.3
Spain (95)	26.7	35.4	0	37.9	0	0	0
Sweden (95)	0.3	99.7	0	0	0	0	0
Switzerland (95)	51.8	40.8	0	3.2	4.2	0	0
U. K. (95)	0	100	0	0	0	0	0

Sources: OECD, Taxing Powers of State and Local Government (Paris, 2001, 1999).

Economic Stability

In the deMello (2001) study, budget balance measured as the ratio of the fiscal deficit to GDP is the dependent variable and subnational tax autonomy is an independent variable. In his estimations, the coefficient of the subnational tax autonomy variable is positive and statistically significant; thus, subnational tax autonomy "worsen[s] fiscal positions." As we have argued, however, a close look at deMello's independent variables shows that they do not represent what he intends to test. For example, his approach to estimating the subnational tax autonomy variable does not distinguish whether the governments have control over the tax rate or tax base. As discussed previously, subnational governments in most developing countries do not control the tax rates; therefore, what he means by tax autonomy is unclear. If tax autonomy is defined as the ratio of own taxes (the sum of first three columns in Table 3) to total subnational revenues, the same variable is negative and statistically significant. Therefore, by following deMello's lead, one could argue that subnational tax autonomy improves the fiscal position of subnational governments.

In deMello's study, the impact of fiscal dependency on subnational fiscal positions is statistically insignificant. He uses the ratio of total transfers to total subnational revenues as the fiscal dependency variable regardless of whether the distribution is based on an objective formula or the central government's discretion. We have estimated the fiscal dependency variable in two ways. The first the same as deMello: the ratio of intergovernmental transfers to total revenue of subnational governments. In order to reduce overestimation bias, our second method excludes transfers that can be treated like own-source revenue (see Table 2), and the fiscal dependency variable is the ratio of the sum of the conditional part of specific grants and the discretionary (not objectively determined) part of general-purpose grants to total subnational revenues.

In our replication, both of the fiscal dependency variables are positive and significant. Therefore, again following deMello's lead, we can argue that intergovernmental transfers "worsen fiscal positions" of the subnational governments. The magnitudes of both fiscal dependency variables are very similar, which suggests that they have the same impact on fiscal position of subnational governments. Finally, we analyzed the impact of subnational non-tax autonomy and subnational tax sharing on

budget balance. Since non-tax revenues and tax sharing are at opposite ends of the revenue autonomy scale, they were expected to have opposite signs. The estimation results in the last two columns of Table 4 show that, although they have opposite signs on unexpected direction, the estimations are statistically insignificant.

Table-4: Replication of the deMello Model: Decentralization and Fiscal Positions (1997-1999) [20]

	Subnational Gov. Balance	Subnational Gov. Balance	Subnational Gov. Balance	Subnational Gov. Balance	Subnational Gov. Balance
Log subnational tax autonomy	-0.003* (0.002)				
Log subnational fiscal dependency (1)		0.003* (0.000)			
Log subnational fiscal dependency (2)			0.002* (0.000)		
Log subnational non-tax autonomy				0.003 (0.002)	
Log subnational tax sharing					-0.022 (0.005)
Adj R^2	0.52	0.71	0.65	0.65	0.63
DW	2.0	2.2	2.2	2.1	2.5
Num. Obs.	19	19	19	19	19

Standard errors are in parenthesis. * Significant at the 1% level. ** Significant at the 5 % level. *** Significant at the 10% level.

Economic Growth

Previously, the debate over the merits of fiscal decentralization was on theoretical grounds of efficiency gains. In a recent study, Davoodi and Zou (1998) analyzed empirically the impact of fiscal decentralization on economic growth and reported a negative relationship across 46 developing and developed countries. There are, however, serious methodological issues in their analysis (Martinez-Vazquez and McNab, 1997).

One problem in the study is misspecification of the fiscal decentralization variable. They measure fiscal decentralization as subnational share of total government expenditure reported in GFS. Subnational share of total government expenditure does not represent the multidimensionality of the fiscal decentralization process. Without controlling for autonomy over expenditure and revenue decisions and whether officials are democratically elected, the expenditure share of subnational governments as a fiscal decentralization variable means very little in representing the level of decentralization. If fiscal decentralization is defined as revenue autonomy of subnational governments, then estimation results might change.

To demonstrate this point, we specified a regression model similar to Davoodi and Zou in order to explore how the revenue structure of subnational governments affects estimation results—whether the negative relationship between fiscal decentralization and economic growth holds, as they suggested. The dependent variable in this model is the growth rate of real per capita output, and independent variables are the same ones used in the previous analysis.

Table 5 reports the estimation results. The first two columns present the impact of own-source revenues on economic growth. The subnational tax and non-tax revenue autonomy variables represent own-source revenue for subnational governments and have positive impact on growth. The next two columns report estimation results for the impact of subnational fiscal dependency (the ratios of intergovernmental transfers to total subnational revenue). The positive coefficients of both fiscal dependency variables are statistically insignificant. The last column presents the impact of subnational tax sharing (the ratio of shared taxes to total subnational revenues) on economic growth. Tax sharing has a negative significant impact on per capita GDP growth.

Table-5: Replication of the Davoodi and Zou Model: Decentralization and Economic Growth (1997-1999)

	Per Capita GDP Growth	Per Capita GDP Growth	Per Capita GDP Growth	Per Capita GDP Growth	Per Capita GDP Growth
Subnational tax autonomy	0.491* (0.022)				
Subnational non-tax autonomy		0.346* (0.080)			
Subnational fiscal dependency (1)			0.196 (0.123)		
Subnational fiscal dependency (2)				0.190 (0.207)	
Subnational tax sharing					-0.437* (0.019)
Adj R^2	0.90	0.76	0.21	0.22	0.73
DW	2.4	1.8	1.9	1.9	1.8
Num. Obs.	19	19	19	19	19

Standard errors are in parenthesis. * Significant at the 1% level. ** Significant at the 5 % level. *** Significant at the 10% level.

Public Sector Size

On the relationship between fiscal decentralization and public sector size, Oates (1985) tested the Brennan and Buchanan "Leviathan" model[21] for a group of 35 countries and argued that the hypothesis does not hold–fiscal decentralization does not limit public sector size. Like previous studies, Oates did not take the revenue structure of subnational governments into consideration, instead measuring fiscal decentralization as subnational share of total government expenditure.

We replicated Oates' model to observe how the revenue structure of subnational governments affects the analysis. Table 6 reports the estimation results. As seen in the first column, subnational tax autonomy has a negative significant impact on public sector size, suggesting that the public sector's expenditure share of GDP decreases with the increase in subnational tax autonomy. The positive coefficient of the subnational non-tax autonomy variable suggests, however, that an increase in non-tax revenues would increase public sector size. The subnational non-tax autonomy variable represents the share of user charges and

administrative fees in total subnational revenues. Given the lack of public services in these countries, it is normal to expect public sector's size grow, with more services financed with user charges. Comparison of the subnational tax and non-tax autonomy variables suggests, however, that such growth would be much less than the cutback suggested by the negative coefficient of the subnational tax autonomy variable. The coefficients for the subnational fiscal dependency and subnational tax sharing variables are statistically insignificant, suggesting that they do not have a significant impact on public sector size.

This exercise shows the importance of choosing the correct fiscal decentralization variable in an empirical study. Once the degree of fiscal decentralization has been represented with the correct variable, the estimation results change significantly. This is not surprising given the interest in fiscal decentralization.

Table-6: Replication of the Oates Model: Decentralization and Public Sector Size (1997-1999)

	Total Government Expenditure % of GDP	**Total Government Expenditure % of GDP**	**Total Government Expenditure % of GDP**	**Total Government Expenditure % of GDP**	**Total Government Expenditure % of GDP**
Subnational tax autonomy	-0.328* (0.017)				
Subnational non-tax autonomy		0.095* (0.014)			
Subnational fiscal dependency (1)			-0.064 (0.050)		
Subnational fiscal dependency (2)				-0.194 (0.004)	
Subnational tax sharing					0.013 (0.010)
Adj R^2	0.99	0.99	0.99	0.99	0.99
DW	2.2	2.3	2.5	2.7	2.3
Num. Obs.	19	19	19	19	19

Standard errors are in parenthesis. * Significant at the 1% level. ** Significant at the 5 % level. *** Significant at the 10% level.

CONCLUDING COMMENTS

Two key conclusions can be drawn from this look at issues that are fundamental in analyzing the impact of fiscal decentralization across countries:

- While it can be demonstrated that there was a great deal of political decentralization in the 1990s, taking the next step to fiscal decentralization has been a bit sketchy. This can be explained in large part by the fact that it takes time for systems to change from a long history of centralization to decentralization. Nonetheless, the pre-conditions of political decentralization are being put in place in many countries, and the present decade promises, for good or ill, to produce genuine governmental restructuring.
- It is important to choose the correct fiscal decentralization variable in an empirical study. Empirical estimations are sensitive to variable selection, and the implications of making the wrong choice may be far-reaching in policy design. Once the fiscal decentralization variable is estimated in a different way, the results change significantly, which shows how fragile the estimation results are. Therefore, the analysis of the impact of fiscal decentralization on macro indicators requires qualitative as well as quantitative techniques that take into account countries' institutional structures.

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Annex 1: Summary Statistics of Data in the Baseline Regressions

Variable	Number of Cross Sections	Number of Observations	Mean	Maximum	Minimum	Standard Deviation	Data Source
Subnational Tax Autonomy	6	19	0.065	0.163	0.000	0.057	OECD
Subnational Non-tax Autonomy	6	19	0.182	0.363	0.040	0.091	OECD
Subnational Fiscal Dependency (1)	6	19	0.308	0.588	0.041	0.153	OECD
Subnational Fiscal Dependency (2)	6	19	0.208	0.545	0.018	0.167	OECD
Subnational Tax Sharing	6	19	0.445	0.910	0.143	0.233	OECD
Subnational Government Balance	6	19	-0.001	0.010	-0.012	0.005	World Bank Economic and Social Database
Per Capita GDP Growth	6	19	0.036	0.106	-0.042	0.034	World Bank Economic and Social Database
Total Government Expenditure % of GDP	6	19	0.378	0.466	0.034	0.099	World Bank Economic and Social Database

Notes

1 World Bank Institute, Washington, DC, USA.

2 World Bank, *The State in a Changing World*, World Development Report (Washington, DC, 1997), Chapter 1.

3 Ibid.

4 Vinod Thomas et al., *The Quality of Growth* (New York: Oxford University Press for The World Bank, September 2000).

5 Pauly, 1973.

6 Central government expenditure, 15 percent of GDP in 1960, double that by 1985 (World Bank, 1997).

7 Bird, 2000.

8 The question of social outcomes (e.g., literacy rates, immunization, school enrollment) is not considered here.

9 The benefit model in public finance is particularly appealing to economists, but it faces two practical problems: it is often difficult to implement appropriate pricing policies and, since it requires acceptance of a "hard budget constraint," can be politically difficult to achieve (Bird, 1993).

10 This checklist is in the form of a multi-page matrix and is available at http://www.worldbank.org.

11 See Fukasaku and deMello (1998) and deMello (2000) on the impact of fiscal decentralization on macroeconomic stability; Oates (1985) and Ehdaie (1994) on the relationship between the government size and fiscal decentralization; and Davoodi and Zou (1998) on the impact of fiscal decentralization on economic growth.

12 This is especially relevant in the context of developing countries, where an important portion of subnational expenditures is either mandated or spent on behalf of central government.

13 There are two reports: Flip de Kam, *Taxing Powers of State and Local Governments*, prepared for the Working Party on Tax Policy Analysis and Tax Statistics, OECD Committee on Fiscal Affairs (Paris 1999), OECD Tax Policy Studies No 1. Leif Jensen et al., *Fiscal Design across Levels of Government, Year 2000 Surveys*, prepared for the Working Group on Fiscal Design across Levels of Government, Central and Eastern European Countries (Paris, 2001).

14 In order to identify subnational governments' control over revenue sources, taxes are subdivided into categories based on the degree of tax autonomy (Table 3 lists these categories in a descending order starting with the highest degree of local autonomy). Own-tax revenues are the sum of the first three categories listed in Table 3 (taxes for which subnational governments have the power to determine both tax rate and base or either one of them); tax sharing revenues are the sum of last four categories.

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[15] All of these characteristics have implications when one considers the degree of decentralization in a given country.

[16] In both Davoodi and Zou (1998) and deMello (2000), there is a clear dichotomy in the estimation results for developing and developed countries. In both, the impact of fiscal decentralization on macro indicators is positive in developed countries and negative in developing countries. Overrepresentation of the degree of fiscal decentralization in the aggregate figure for developing countries might be the reason for the negative relationship.

[17] If greater decentralization increases the number of alternative fiscal jurisdictions, any attempt to increase tax rates in one jurisdiction would result in migration of its residents to another (Tiebout, 1956). In Tiebout's analysis, taxpayers migrate in order to avoid higher taxes and interjurisdictional competition, thereby limiting excessive taxing power of the governments. Along the lines of Tiebout, Brennan and Buchanan (1980) developed the "Leviathan" hypothesis, which argues that fiscal decentralization serves as a constraint on the behavior of the revenue-maximizing government. The "Leviathan" hypothesis predicts that the overall size of the public sector should vary inversely with fiscal decentralization; fiscal decentralization increases competition among local governments, which ultimately limits the size of the public sector.

[18] We are aware of the shortcoming of their approach discussed on different studies such as Martinez-Vazquez and McNab, 1997.

[19] We have only three years of data for six countries except Hungary (four years). Therefore, in order to avoid degrees of freedom problem, we use bivariate regressions rather than the original models of multivariate estimations. A summary of descriptive statistics and data sources is reported in the appendix.

[20] In order to alleviate specification error problems, we used state dummies to capture state-specific characteristics, e.g., location, climate, and initial endowments. Therefore, our econometric estimates are based on a fixed effect model. In addition, given the variations in the dependent variables across the observation units, with some states exhibiting much more variance than others, the potential heteroskedasticity problem is corrected for by utilizing the Generalized Least Square (GLS) estimation procedure.

[21] About "Leviathan" hypothesis see footnote 17.

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