The Macroeconomic Impact of Decentralized Spending and Deficits: International Evidence

Francesca Fornasari, Steven B. Webb

The World Bank, 1818 H St. NW, Washington, DC 20433, USA

and

Heng-fu Zou

Guanghua School of Management, Peking University, Beijing, 100871, China
Institute for Advanced School, Wuhan University, Wuhan, 43007, China
The World Bank, 1818 H St. NW, Washington, DC 20433, USA

The main macroeconomic questions about decentralization are whether it has led to an overall expansion of the public sector or to unsustainable fiscal deficits. In the long term, subnational spending contributes to a larger overall government sector, but steady subnational deficits do not affect the average level of central government deficits, according to our economic analysis of 32 industrial and developing countries, 1980-94. Increases of subnational spending and deficits, however, lead to increases in spending and deficits at the national level. The relationships are strong economically as well as significant statistically. We can reject the hypothesis that increases of transfers between central and subnational governments are usually determined exogenously by the center. © 2000 Peking University Press

1. INTRODUCTION

Decentralization of government has occurred in OECD countries for decades, or longer. In developing countries it is a recent and strong trend as new democracies strengthen local demands for resources or central governments cut expenditures by transferring service responsibilities to lower levels of government (IDB 1997; Pasha 1997; and Fukasaku and de Mello 1997). There are many reasons to decentralize. To economists it seems

403

more efficient for the local community to choose the basket of services it favors and is willing to pay for (Tiebout 1956; Oates 1972; Bahl and Linn 1992; and Shah 1994). Also, local control can reduce the principal-agent problems in monitoring and management. From a political perspective, decentralization can enhance local democratic participation, mollify separatist tendencies, and help restrain dictatorial tendencies of central governments (Inman and Rubinfeld 1997; Tanzi 1996; and Weingast 1997).

Fiscal decentralization can also cause problems, however. For one reason, it often separates spending decisions more from the tax decisions. For example, subnational governments may overspend expecting to get more resources from the common pool of national resources. Geographically dispersed interests also present the danger, theoretical and actual, that some subnational representatives to the national government will collude to extract more resources from the common pool (Alesina and Perotti 1994). Thus, there are efficiency and equity concerns, and other concerns that decentralization will lead to problems with macroeconomic management (Tanzi 1996; Prud' homme 1995). For example, potential problems include hampering the central government's ability to carry out stabilization policy because they have to share or totally relinquish the more efficient tax bases, creating higher average deficits of the central government because its direct spending is not reduced as it increases transfers or gives up tax bases to subnational governments, and accumulating unsustainable deficits by subnational governments that expect some bailout from the center (Dillinger, Perry and Webb, 2000).

These concerns have been theoretical, anecdotal, and prescriptive. Decentralization does not necessarily lead to more deficits, they argue, because the central government can set strict limits on its support to subnationals. Subnationals in turn should have political incentives to restrain spending for which their taxpayers and voters pay in full at the margin. Anecdotes point to countries like the United States and Sweden who have been successful in using such means to prevent subnational finances from disrupting macrofiscal management. Counter-examples of macro-mismanagement in decentralized systems are also cited and duly condemned. Prescriptions then follow, to keep a hard budget constraint, to restrain local borrowing, etc. (Ter-Minassian 1997). It is hard to fault the recommendations, except to ask which are most important.

The question remains. Does decentralization cause deficits frequently enough to be a major worry for countries moving in this direction? Systematic evidence to confirm success or failure is scarce. For states and cities in the United States, there is evidence on which type of self- regulations by states works best. Of course, subnational deficits are rarely a major macroeconomic worry, despite the extreme degree of decentralization of the U.S. public sector (see for instance Inman and Rubinfield 1997).

With a cross-section of Latin American and OECD countries, Stein (1997) finds that greater decentralization, measured by the subnational share of total public spending, is associated with more total public-sector spending, but not with higher deficits of the total public sector. They find that the interaction term of decentralization with lack of borrowing constraints is associated with larger aggregate deficits. Fukasaku and de Mello (1997) investigate a sample of OECD and large developing countries to distinguish between subnational and central government fiscal variables. Their cross-section data show that subnational government size (spending as a share of GDP) is uncorrelated with central government balance in the whole sample, but is correlated negatively with the subnational government balance in the whole sample, and with the central government balance in the subsample of developing countries. The samples were too small for most results to be significant, and it was not possible to control for other influences. The strongest result is that larger subnational spending share is negatively correlated with growth for the developing country subsample, and for the Latin and Asian subsamples.[1]

Thus the cross-section evidence leaves us with suspicion that more subnational government spending means trouble, but we are unsure of the result or how it operates. This paper pushes the investigation further with panel data. The main question it seeks to answer is: Does the multi-country evidence show that subnational spending and deficits contribute to problems with the management of central government finances?

2. EXPECTED RELATIONSHIPS

To examine the possible role of fiscal decentralization in macroeconomic management problems, we first clarify the statistical relationships expected under various types of intergovernmental fiscal relations. While no actual system follows a pure type, the relationship between central and subnational governments can be seen as mixture of three main cases: complete independence; transfers controlled by the central government; and transfers controlled by the provinces, municipalities and other subnational entities (henceforth, provinces).

2.1. Complete independence between the central and subnational government

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[1] The negative relation of growth with subnational spending share in the developing sample is significant at the 1 percent level, which corroborates Davoodi and Zou (1998), and Zhang and Zou (1998). For OECD countries, Fukasaku and de Mello (1997) find a weak (10 percent significant) positive correlation of growth with subnational spending shares.

In this first case, completely independent provinces raise their own taxes and decide their own spending. If higher subnational tax revenue comes at the expense of the tax base of the central government, and this leads to higher national deficits, then one would expect a positive correlation (cross-section average) between subnational taxes and central government deficits in the longer term. For short-term fluctuations within a country, one would expect no correlation of central and subnational fiscal variables, after controlling for common effects of the economic environment.

No country today fits this description completely, but a number of decentralized countries have assigned major tax bases to subnational governments for their exclusive use. Brazil assigns the general value added tax to the states. India assigns them the sales tax. As their revenue bases decline the central governments often retain or even increase their spending responsibilities, resulting in larger fiscal deficits.[2] The 1988 Brazilian Constitution accelerated the decline in centrally retained tax revenue, contributing to larger fiscal deficits (Tanzi 1996). In Argentina, when faced with the need to cut fiscal deficits and maintain macroeconomic balances, the authorities introduced major tax reforms in the early 1990s and sharply raised the share of taxes in gross domestic product (GDP). "But the potential impact of this effort on reducing the public sector's deficit was dissipated by the revenue-sharing arrangement, which required that 57 percent of any additional tax revenue coming from the central government's effort be shared with the provincial governments, which immediately spent the additional revenue" (Tanzi 1996, p.308). In addition, as the Argentine central government tried to reduce its spending through privatization and employment reductions, provincial governments were expanding their employment and spending, partly as a result of the additional tax revenue received. Thus, the revenue-sharing system can make deficit reduction more difficult at the national level.

2.2.   Transfers controlled by the central government
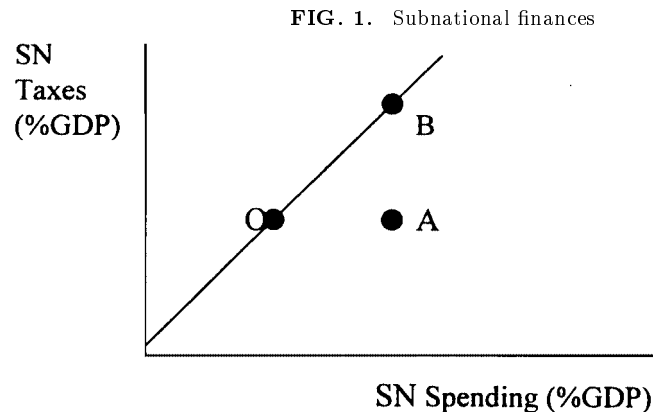
In the second case of intergovernmental fiscal relations, the central government shifts spending responsibility to subnational governments and provides transfer money to finance them, but the center retains full control over the amount, or it is specified by a rule related to revenues of the center. In other words, at least in their relations to the center, subnational governments face hard budget constraints. They can spend as much as the central government decides to give them, plus whatever they raise through their own taxes and borrowing. With this type of intergovernmental fiscal relationship, the subnational government is spending federal money on av-

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[2]See Tanzi (1996).

erage but not at the margin, as long as they raise some nontrivial resources of their own.

If the transfers count as central government spending, which is necessary in this investigation, because direct data on the amount of intergovernmental transfers are not reliable, then there would be a positive correlation between central and subnational spending when the system was in place and the transfer changed in order to finance a particular change in subnational spending. Examples of this arrangement are Chile and the United States, where all of the transfers are in the budget, although they might be too small to affect the aggregate econometric result. Transfers could also be by a formula to share federally collected taxes, in which case they would not appear as federal expenditure but might be counted as states' own revenue, as in Argentina and Brazil.

Figure 1 is useful to understand the arithmetic. If subnational spending moves by 1 unit (say, % of GDP) for O to A, with no increase in local taxes, then transfers of the central government would increase by 1. But does the central government cut back its own direct spending, leading to no change is overall central government outlays (transfers plus direct spending)?

FIG. 1.   Subnational finances

SN
Taxes
(%GDP)

B

O   A

SN Spending (%GDP)

In a steady state, long-term average, if subnational governments were financing more of their spending with taxes, they would be getting less from the center. Shorter-term fluctuations in central spending, however, would not correlate with subnational taxes or deficits. If subnational spending is fully financed with taxes, moving from O to B (perhaps as in case 1), then the central government does not have to increase transfers and they could cut their own outlays (including transfers) if the subnational spending fills a function on which the central government can stop spending.

Central government deficits would not depend on subnational fiscal variables, for one would not expect the central government to borrow to make

planned transfers. So, fiscal decentralization of this sort would not lead to greater deficits at the national government level.

2.3.   Transfers controlled by subnational governments

In the third case, although the central government has theoretical control over its transfers to subnationals, in practice it may surrender some control to subnational governments or to their representatives in the national legislature. In the simplest case, if the subnational government increases spending beyond the increase of its initial transfer plus local taxes, the central government increases the current transfer to make up the difference. Typically the central government would exercise some political discretion in deciding such ad hoc transfers.

More complex cases arise when the subnational governments do not get enough transfers to fill their gap, they run a deficit, borrow, and then go to the central government for a bailout later when the debt burden becomes unsustainable. In some cases, the subnational debt goes through the banking system to end up at the central bank, and only shows up on the central government accounts when it has to make up losses of the central bank. Argentina before the stabilization of 1991 and Brazil in the 1980s and 90s provide a variety of examples (Dillinger and Webb 1999). Brazil's state debt crisis was the largest subnational debt crises ever experienced in a developing country. At its peak in 1995, states were in default on roughly US$8 billion in interest owed to the federal government. In 1996, the operational deficit of state government constituted half of the total public sector deficit (Dillinger 1997). Other countries have also experienced the adverse effect of local government borrowing on government budget and macroeconomic stability. As reported in Tanzi (1996), the Argentine provinces were able to finance a deficit of about 0.7 percent of GDP; and in Mexico the finances of its thirty-two states have been described as "precarious," and some states as "bankrupt."

In cases of the third type, the subnational government is spending other peoples' money not only on average and but also at the margin, effectively getting rewarded with a larger subsidy for spending more–the common pool resource problem. In these situations, fiscal decentralization would contribute to deficits as well as increased spending at the national level. Thus, one would expect national spending to depend not only on subnational spending, as with the hard-budget transfers (type 2), but also on subnational deficits. Subnational spending would have a positive coefficient and taxes would have a negative coefficient. The subnational deficit would also have a positive coefficient, but it would not be for the current year. If calendar years of observations corresponded to the fiscal years, then a subnational deficit would occur only to the extent that a federal transfer did not fill the gap. Any increase of central government spending

and borrowing to pay for debt relief to subnational government would come with a lag after they ran deficits.

When a central government loses control of its transfers to subnational governments it is usually partly due to a combination of political and economic factors. The size of outstanding subnational debt is also potentially important, for a larger debt is likely to exceed the threshold to get a bailout from the center. The hardness of the central government's own budget constraint should also affect its willingness to bailout the provinces, as it apparently has in Argentina (Dillinger and Webb 1999). Central bank independence is one identifiable factor that supposedly hardens the central government budget constraint.

The political independence of the subnational governments—and whether they are democratically elected and are constitutionally independent (federal vs. unitary)—may possibly explain their determination to spend more with resources from the center. But the degree to which the center controls the subnational levels may explain the willingness of the center to provide extra resources. So empirical evidence would have to resolve whether subnational political independence has a stronger effect on the supply or the demand for extra resources from the center.

3. DATA AND METHOD

To investigate how subnational spending and deficits affect the management of central government finance, this paper looks at the experience of 17 developed (upper income) and 15 developing countries over 15 years, 1980-94. See appendix Table A-1.

3.1. Data

All of the countries included in the current study are reported in the International Monetary Fund (IMF)-Government Financial Statistics (GFS) as having at least two levels of government. The binding constraint in the choice and number of countries included is the availability of data, primarily at the subnational level: we included all countries with at least eight years of data during 1980-94. The variables fall into four categories: central government' fiscal performance, subnational governments' fiscal performance, political/institutional characteristics, and macroeconomic control variables.

3.1.1. Central government's fiscal performance

The two central government fiscal variables are the main dependent variables: primary expenditure and primary deficit, both as percentages of GDP. Primary expenditure and primary deficit exclude interest payments

and there are two main reasons for this. First, it can be argued that interest payments are a function of the exogenous interest rate and the predetermined stock of debt and hence would not be affected by the current subnational fiscal behavior. Second, the interest expense data are especially inconsistent concerning accrued as well as cash interest payment, and adjustments for inflation. Central government spending also includes transfers to the subnational level. It would have been useful to analyze this category separately, but it was not reported consistently. All the data come from the IMF-GFS.

Appendix Tables A-2 and A-3 provide descriptive statistics on the central government fiscal position. The average primary surpluses for all countries is 0.2 percent of GDP, while the average overall balance is a deficit of −3.5 percent. The average balances for the upper-income and developing subsamples are very similar. The developing countries on average have much lower primary (and total) expenditures: 20.99 (24.87) percent of GDP compared to 33.75 (37.33) percent in developed countries. It is important to note that these averages hide very different realities. For example, Brazil has an average primary surplus of 4.16 percent of GDP, with the overall balance in a deficit equivalent to 7.24 percent of GDP; Luxembourg boasts an average primary surplus of 2.43 percent of GDP and an overall surplus of 1.98 percent of GDP. Tax revenue in developing countries is lower also, by an even larger margin, mainly because non-tax revenues are more important there (mainly royalties from minerals).

3.1.2. *Subnational government's fiscal performance*

Three different variables are used to proxy both the level of fiscal decentralization and the performance of subnational governments: expenditure, tax revenue, and deficits.[3] These figures include all the levels of government reported in the IMF-GFS other than the central government. Like in the previous group, all variables are transformed in percentage of GDP.

Appendix Tables A-4 and A-5 provide descriptive statistics on subnational government fiscal variables. Many of the observations for the central national government fiscal variables carry over to lower levels of government. Namely, on average, developing countries have lower primary (total) subnational expenditure: 5.6 (5.9) percent of GDP compared to 16.5 (17.5) for developed countries. Subnational governments' average tax revenue is

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[3] Tax revenue figures from the IMF-GFS include the subnational government's own tax revenue and, in at least some cases, revenue resulting from tax-sharing arrangements with the central government. The latter limits the usefulness of the subnational tax data.

also lower in developing countries: 2.2 percent of GDP vs. 7.5 percent. While developing countries have much smaller subnational public sectors on average, the upper-income countries have an average primary surplus of 0.35 percent of GDP while the corresponding figure for developing countries is a deficit of 0.43 percent. Still, subnational governments of developing countries on average have about the same overall deficits: 0.68 percent vs. 0.70 percent of GDP for upper income. As two sharply different realities representative of the differences between developed and developing countries, one should note the case of India and the United States. Both are considered very decentralized countries, however, the United States subnational governments have an aggregated average primary (overall) surplus equivalent to 1.31 (0.91) percent of GDP, while India's subnational governments' primary (overall) balance is a deficit of 1.8 (2.92) percent of GDP.

3.1.3. Political/institutional variables

Six variables capture some of the political/institutional incentives that might affect expansionary fiscal behavior of one or more levels of government. The first variable measures the lack of independence of the central bank. It is composed of a linear combination of the five-year moving average of the number of changes by the central bank director per year and a dummy for the change of the central bank governor within 6 months of a political transition (any change of government leaders). The value of the latter variable persists throughout the tenure of the economy. The source of this information is Cukierman and Webb (1995), and the Europa Yearbook (1995) and correspondence with central banks. The interpretation of this variable is the following: more frequent turnover indicates a lower degree of central bank independence, as does a change of the governor immediately following a change of government leaders.[4]

Other researchers have found that constraints on subnational borrowing could help improve fiscal performance of subnational governments and to restrain the overall size of government (Ter-Minassian and Craig 1997; IDB 1997). So some investigation seemed warranted. Our variable is a dummy equal to 1 if Ter-Minassian and Craig (1997) said the country had either a complete prohibition against borrowing or a non-discretionary rule to constrain it ex ante, which were the two types of constraints they considered to be effective. The variable is only a cross- section for the 1990s; it does

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[4] Furthermore we assumed that if a government changed the central bank governor in the first six months, then the government was marked as interventionist for its entire term.

not show changes over time and is not accurate for the 1980s for some countries. The interview sources for much of their information would not be usable to recover comparable information for the 1980s.

The four additional variables are dummies to measure the possible effects of the political environment on central or subnational public finance. These latter are: (i) unitary vs. federal state; (ii) elected vs. unelected subnational governments; (iii) any major political transition, from an authoritarian (democratic) regime to a democratic (authoritarian) regime within that year; and (iv) a dummy variable describing the exchange rate regime (i.e., pegged vs. flexible). The source of this information was primarily the Europa Yearbook (1995), with additional information from The Economist Intelligence Unit country reports.

3.1.4. *Control variables*

To ensure that any correlation between fiscal decentralization and central government's performance is not due to the effect of the general macroeconomic environment, four control variables are also included in the analysis: (i) the growth rate of real GDP,[5] (ii) the log of per capita GDP in U.S. dollars in 1980, (iii) a transformed measure of Consumer Price Index (CPI) inflation,[6] and (iv) the percentage of urban population. The source of these variables is the IMF- IFS and the World Bank's *World Development Indicators*.

3.2. **Models and Method**

To investigate the relationship between central and subnational finances and other political and economic variables, three models are presented. The first (Basic Model) excludes all political variables:

$$\text{CGFiscal}_{i,t} = \alpha_0 + \alpha_1 * \text{SNGFiscal}_{i,t} + \alpha_2 * \text{Control}_{i,t} + \epsilon_{i,t}; \qquad (1)$$

where $\text{CGFiscal}_{i,t}$ represents the proxy for the central government's fiscal behavior, $\text{SNGFiscal}_{i,t}$ represents the proxy for the subnational government's fiscal behavior, and $\text{Control}_{i,t}$ represents the control variables included in the empirical analysis.

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[5] Measured in 1987 prices.

[6] The transformed measure of CPI inflation is calculated in the following way: $\pi/(1 + \pi)$, where π is the CPI inflation rate and where $\pi = 1$ refers to an inflation rate of 100 percent.

The second model (Unconditional Political Model) includes political variables as additional elements:

$$\text{CGFiscal}_{i,t} = \alpha_0 + \alpha_1 * \text{SNGFiscal}_{i,t} + \alpha_2 * \text{Political}_{i,t}$$
$$+ \alpha_3 * \text{Control}_{i,t} + \epsilon_{i,t}; \tag{2}$$

where $\text{Political}_{i,t}$ represents the political/institutional variables which might contribute to any correlation between central and subnational government finances.

The third model considers the possibility that the *impact* of subnational fiscal variables on central government fiscal variables, i.e., the coefficient α_1, depends on a set of political variables, i.e.:

$$\text{CGFiscal}_{i,t} = \alpha_0 + \alpha_1 * \text{SNGFiscal}_{i,t} + \alpha_2 * \text{Political}_{i,t}$$
$$+ \alpha_3 * \text{Control}_{i,t} + \epsilon_{i,t}; \tag{3}$$
$$\alpha_1 = \delta_0 + \delta_1 * \text{Political}_{i,t} + \nu_{i,t} \tag{4}$$

Thus leading to the following model (Conditional Political Model):
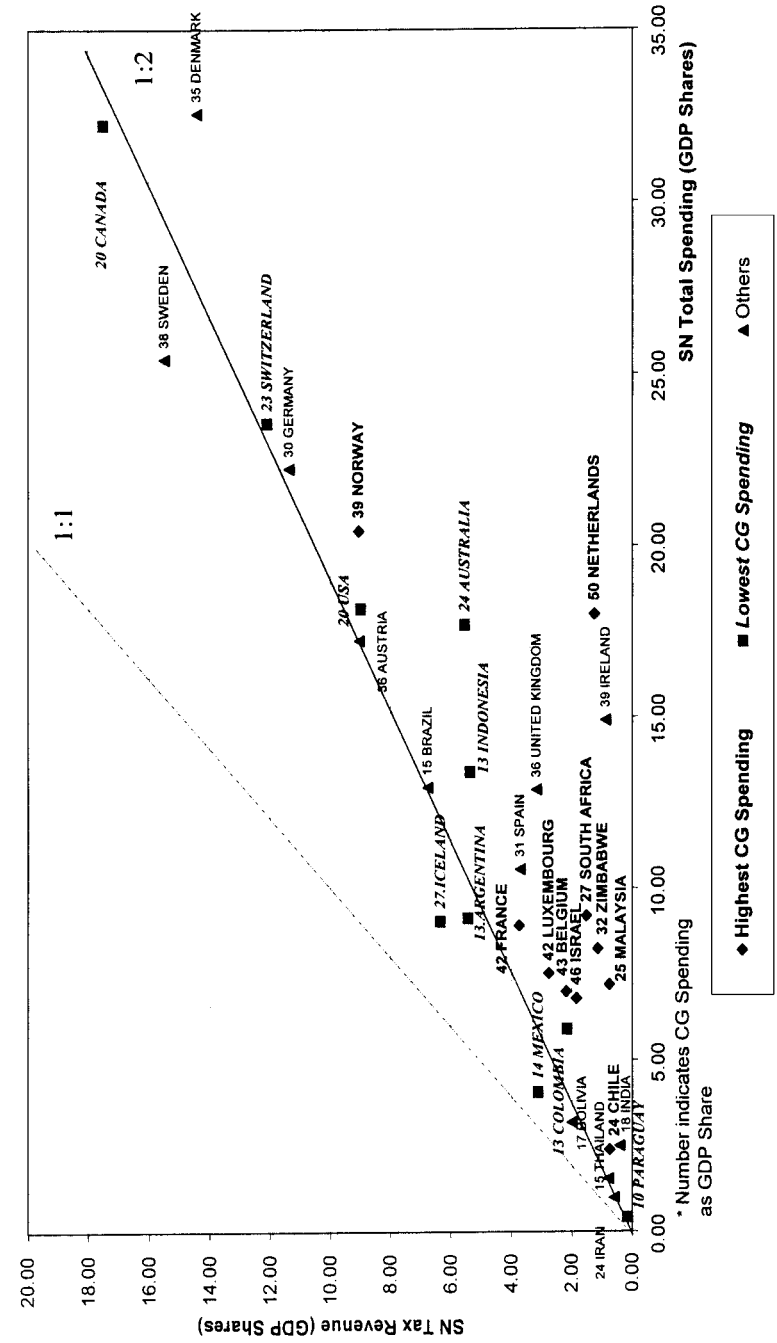
$$\text{CGFiscal}_{i,t} = \alpha_0 + \delta_0 * \text{SNGFiscal}_{i,t} + \delta_1 * \text{Political}_{i,t} * \text{SNGFiscal}_{i,t}$$
$$+ \alpha_3 * \text{Political}_{i,t} + \alpha_4 * \text{Control}_{i,t} + \eta_{i,t}; \tag{5}$$

where $\eta_{i,t} = \nu_{i,t} + \epsilon_{i,t}$ are iid. This is a more general version of the Unconditional Political Model because it allows the political variables to influence both directly and indirectly through subnational fiscal behavior, central government primary expenditure and deficit.

Most regressions (see Tables 2-3) are done with all fiscal variables in first differences. Augmented Dickey-Fuller Tests and the Durbin-Watson statistics of regressions run using levels indicate that the series are not stationary.

All panel data estimates are done with the Feasible Generalized Least Squares (FGLS) method, which corrects for cross-section heteroskedasticity by estimated cross-section residual variances. Furthermore, White's heteroskedasticity correction is used, thus making the covariance robust to general heteroskedasticity problems. This form of heteroskedasticity is more general than the cross-section heteroskedasticity, since variances within a cross-section are allowed to differ across time.

FIG. 2. Central government spending as a function of SN spending and taxes

* Number indicates CG Spending as GDP Share

♦ Highest CG Spending   ■ Lowest CG Spending   ▲ Others

4. RESULTS

4.1. Cross-section

Cross-section data give a picture of longer term relationships. Figure 2 shows the data laid out in the same space as Figure 1. The location of each observation shows the GDP share of subnational spending and taxes—the main independent variables in column 4 of table 1. Countries that are farther out on the x-axis have more subnational expenditures as a share of GDP. If subnational governments paid for all their expenditures with their own taxes, they would be on the 1:1 line, but no country with much decentralization is close to that line. The most self-reliant are only a little above the 1:2 line—own revenues paying for about half of subnational expenditures.

The number by each observation and the font of the country name show the central government spending shares—one of the dependent variables in the subsequent statistical analysis. Almost all of the countries that are far below the 1:2 line and close to the x-axis (heavy transfer dependency) had relatively central government spending (among the top third of the sample, labeled in bold).[7] Most of those on or above the 1:2 line had small central governments (in the bottom third of the sample. bold italics). In other words, having subnational spending financed mostly with transfers increase the size of the central government and of total government.

We investigate the relations more systematically with regressions, with the results shown in Table 1. The dependent variables are either central government primary spending or primary deficits. In addition to the standard control variables, the subnational fiscal variable is either subnational total spending and taxes, as a group, or lagged subnational overall deficits. Only two coefficients have t-statistics indicating significant difference from zero: subnational expenditure and tax revenue respectively raise and decrease central government's primary expenditure. A number of control variables are also included, and they do not have much effect on the signs and significance of the subnational fiscal variables.[8]

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[7] The industrial and developing countries were divided and then each group was ranked according to the average GDP share of central government spending and divided into equal sized groups of high, medium and low central government spending. Of the 32 in the sample, the high central government spending group was Netherlands, Belgium, Luxembourg, France, Norway, Israel, Zimbabwe, South Africa, Malaysia, and Chile. The low central government spending group was Iceland, Austria, Switzerland, United States, Canada, Mexico, Argentina, Indonesia, Colombia, and Paraguay.

[8] We also ran some cross-section regressions with sub-national spending and deficits as the dependent variables. For subnational spending, none of the coefficients were significant at even the 10 percent level. For subnational deficits the borrowing controls

TABLE 1.
Basic Model: Cross Section
Overall Sample Estimates[a]
(All dependent variables are net of interest payments)

Dependent Variable	CG Deficit to GDP	CG Exp. to GDP	CG Deficit to GDP	CG Exp. to GDP
Constant	5.404**	0.619	5.867**	−5.506
	2.250	0.056	2.211	− 0.566
SN Tot Expenditure			−0.041	1.009**
to GDP			−0.384	2.556
SN Tax Revenue			0.033	− 2.110**
to GDP			0.180	− 3.132
Lag Overall SN	0.758*	−0.199		
Deficit to GDP	1.884	−0.108		
Lag CPI Inflation	−0.073**	−0.206	−0.068**	−0.122
	−2.691	−1.649	− 2.167	−1.060
Percentage Urban	−0.029	0.160	−0.026	0.128
Population	− 1.162	1.398	− 0.959	1.268
1980 GDP Per	−0.272	2.157	−0.248	2.836**
Capita in US$	− 0.799	1.380	− 0.661	2.065
Real GDP Growth	−0.539**	0.586	−0.570*	0.320
	−2.096	0.496	−2.012	0.309
Adj. R-Squared	0.25	0.36	0.13	0.52
No. Time Observations	1	1	1	1
No. Cross Section	32	32	32	32

Note: a. The number in italics represents the t-statistic associated with each coefficient. Furthermore, * indicates significance level of 10 percent, while ** indicates a significance level of 5 percent.

The coefficient on subnational spending is about 1.0, which implies that, holding subnational taxes constant, subnational spending is correlated in a one-to-one ratio with central government spending. As noted earlier, if the central government were reducing its own spending as local governments took on more responsibility, the coefficient would have been about zero (since local taxes were in the regression). So the subnational spending not funded by local taxes (and therefore mostly paid with transfers) seems to have been largely additional to central government spending, not a substitute. In contrast, the coefficient for subnational taxes is approximately −2.0 and statistically significant. This suggests that for a given level of

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variable had a negative coefficient significant at the 6 percent level and being a federal system had a positive coefficient significant at the 5 percent level.

subnational spending, more financing with local taxes has a double effect in reducing central government outlays. Local taxation not only relieves the central government of making transfers to finance the local spending, but it also seems to occur in situations where local spending is a substitute for central government spending.

These results suggest that on average: (1) decentralization of spending by transfers increases the size of total government, a result consistent with what Stein (IDB 1997) got with an all-Latin America sample; and (2) to the extent that subnational governments finance themselves with their own taxes, the public sector at the national level tends to be smaller by about as much as the subnational spending, leaving the overall size of the public sector about the same. From the cross-sectional evidence it is not possible to draw conclusions about causality and sequencing, but the intriguing possibilities suggest the benefit of further research on the way that decisions to finance with local taxation are related to the decisions about the allocation of service responsibilities.

Cross-section regressions with subnational deficits indicate that they did not on average affect the national spending or the national level deficit, nor did the subnational spending have a statistically significant relation with the national government deficits. This implies that when countries are decentralized in a long-run steady state—which is the interpretation of these of these cross-country regressions on averages per country—they do not have higher national deficits on average than the less decentralized countries. They have presumably developed institutions—and raised taxes—at least adequate to avert the macroeconomic fears concerning deficits.

4.2.   Panel Data

The panel regression with changes in the national and subnational fiscal variables got very different results[9] (see Table 2). They show that increases of subnational spending and deficits lead to higher spending and deficits at the national level. The relationships are strong economically as well as statistically significant.[10] The results in columns 1 and 2 have the clearest meaning–An increase in subnational deficits is associated with an economically and statistically significant increase in central government spending and deficits in the subsequent period. This is consistent with a pattern

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[9] First differences were used because the time series of values in levels were non-stationary, and the errors in the regressions were serially correlated.

[10] These results show up when we look at changes between 5-year periods, as well as with annual changes. They also show up in the subsets for developing and industrial countries.

of the central government bailing out states and cities when they have increased borrowing too much. During 1980-95, most of the countries in the sample were reducing their central government deficits. But the ones that had the largest average increases of subnational spending and deficits—ranked to the right in the charts—decreased their central deficits the least, or increased them on average (see fig. 2).

The results with the panel data focus on changes over time in each country. Since we are unable to reject the nonstationary hypothesis [11] and the Durbin-Watson statistics strongly indicated serial correlation of errors, the regressions are estimated with fiscal data in first differences (see Tables 2 and 3 to 3.2). The current subnational deficit was dropped because it was usually not significant when included in the same equation with the lagged deficit and a priori we would expect the subnational deficits to effect national finances with a lag, as noted earlier.

In interpreting these results, it is important to recognize the use of first differences means that the results are determined mainly by the countries and periods when the levels of spending and deficits at the national and subnational levels are changing rapidly: that is, by those in which increased decentralization is taking place. In these times and places, we can reject the hypothesis that the transfers between central and subnational governments are usually determined exogenously by the center. The process of fiscal decentralization tends to cause problems. These results are powerful arguments against rapid decentralization without adequate safeguards.

The results in the panel data held up even with the inclusion of political-institutional variables–major national political transitions and central bank independence and two that pertained directly to decentralization–election of subnational officials and unitary/federal constitution. The political (institutional) variables by themselves usually have little influence on central government performance, but were often influential in interaction with the subnational fiscal variables.[12]

Whether or not local officials were elected had no effect on the intergovernmental fiscal relations considered here. In other words, local democracy does not seem to worsen, or improve macroeconomic fiscal management on average. Being a unitary state (rather than a federation), on the other hand, significantly increased the extent to which national government

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[11] Tests were based on the Augmented Dickey Fuller Test.

[12] In the Conditional Political Model the proxy for central bank independence and the dummy for high transition countries are included also directly because of their possible impact on central government fiscal behavior through avenues not related to subnational government finances.

TABLE 2.

Basic Model: Panel Data, Fiscal Variables in First Differences[a]

Overall Sample Estimates[b]

(All dependent variables are net of interest payments)

Dependent Variable	CG Deficit to GDP	CG Exp. to GDP	CG Deficit to GDP	CG Exp. to GDP
Constant	−0.045	0.459*	−0.413	−0.069
	−0.092	*1.838*	*−0.932*	*−0.312*
SN Tot Expenditure			0.322**	0.538**
to GDP			*4.007*	*8.121*
SN Tax Revenue			−0.176	−0.073
to GDP			*−1.004*	*−0.571*
Lag Overall SN	0.234**	0.261**		
Deficit to GDP	*2.805*	*7.902*		
Lag CPI Inflation	−0.054**	−0.013	−0.057**	−0.028
	−2.806	*−0.592*	*−3.368*	*−1.509*
Percentage Urban	−0.007**	−0.013**	−0.010**	−0.012**
Population	*−2.019*	*−4.657*	*−2.693*	*−4.959*
1980 GDP Per	0.070	0.089**	0.123*	0.128**
Capita in US$	*0.985*	*2.113*	*1.878*	*3.393*
Real GDP Growth	−0.150**	−0.194**	−0.143**	−0.142**
	−8.141	*−13.545*	*−8.896*	*−12.706*
Adj. R-Squared	0.10	0.23	0.14	0.33
D. W. Statistic	2.12	1.77	2.13	1.82
No. Time Observations	13	13	13	13
No. Cross Section	32	32	32	32

Notes:

a. In all the following regressions, i.e., Tables 3 to 6, the only variables that are in first difference are the dependent variable and the fiscal explanatory variables, i.e., total expenditure, tax revenue, and deficit.

b. The number in italics represents the t-statistic associated with each coefficient. Furthermore, * indicates significance level of 10 percent, while ** indicates a significance level of 5 percent.

spending was related to subnational spending and deficits, but this might just reflect the fact that the national spending figure includes some transfers to states and one would expect budgeted transfers (rather than tax sharing or delegated taxes) to be more important in a unitary state. Being a unitary state does not significantly affect the transmission of subnational deficits to national deficits.

The significant coefficient on subnational deficits in the equations for both spending and deficits of the central government suggests that cen-

TABLE 3.
Conditional Political Model in First Differences[a]
Overall Sample Estimates[b]
(All dependent variables are net of interest payments)

Dependent Variable	CG Deficit to GDP	CG Exp. to GDP	CG Deficit to GDP	CG Exp. to GDP
Constant	0.379	0.808**	−0.093	0.021
	0.683	*2.391*	*−0.179*	*0.076*
SN Tot Expenditure			0.816**	1.158**
to GDP			*3.539*	*8.286*
SN Tax Revenue			−0.147	−0.168
to GDP			*−0.875*	*−1.261*
Lag Overall SN Deficit	0.443*	0.678**		
to GDP	*1.919*	*2.725*		
Cond. Political Central	1.900**	1.386**	0.161	0.230
Bank[c]	*2.481*	*2.912*	*0.364*	*0.675*
Cond. SN Government	−0.276	0.047	0.095	0.009
Elected	*−0.693*	*0.206*	*0.344*	*0.050*
Cond. High Transition	−5.194**	−3.606**	−0.144	−0.411**
	−5.243	*−5.983*	*−0.707*	*−2.851*
Cond. Federal State	0.044	−0.604**	−0.732**	−0.641**
	0.134	*−3.365*	*−2.801*	*−4.221*
Cond. Fixed Exchange	−0.506*	−0.377**	−0.002	0.006**
Rate	*−1.916*	*−2.050*	*−0.295*	*2.153*
Political Central Bank	−0.429**	−0.309**	−0.528**	−0.021
	−2.546	*−2.287*	*−2.335*	*−0.152*
High Transition	1.415**	−0.110	1.340**	1.200**
	2.726	*−0.238*	*2.151*	*3.230*
Lag CPI Inflation	−0.056**	−0.019	−0.058**	−0.024
	−2.831	*−0.837*	*−3.413*	*−1.154*
Percentage Urban Pop	−0.004	−0.011**	−0.007**	−0.011**
	−1.073	*−3.714*	*−2.007*	*−3.561*
1980 GDP Per Capita	0.002	0.046	0.076	0.100**
in US$	*0.025*	*0.893*	*1.020*	*2.100*
Real GDP Growth	−0.174**	−0.217**	−0.139**	−0.128**
	−9.173	*−12.494*	*−8.918*	*−12.120*
Adj. R-Squared	0.19	0.24	0.17	0.37
D. W. Statistic	2.10	1.76	2.22	1.88
No. Time Observations	13	13	13	13
No. Cross Section	32	32	32	32

Notes:

a. In all the following regressions, i.e., Tables 2.1 to 3, the only variables that are in first difference are the dependent variable and the fiscal explanatory variables, i.e., total expenditure, tax revenue, and deficit.

b. The number in italics represents the t-statistic associated with each coefficient. Furthermore, * indicates significance level of 10 percent, while ** indicates a significance level of 5 percent.

c. The term "conditional" means that the political variable has been multiplied by either the lagged value of the SN Overall Deficit (the case of the first two regressions represented in this table) or by the SN Total Expenditure (the case of the last two regressions).

TABLE 3.1.

Conditional Political Model in First Differences[a]

Developing Countries Estimates[b]

(All dependent variables are net of interest payments)

Dependent Variable	CG Deficit to GDP	CG Exp. to GDP	CG Deficit to GDP	CG Exp. to GDP
Constant	0.157	−0.781	1.184	0.396
	0.110	*−0.774*	*1.096*	*0.513*
SN Tot Expenditure to GDP			0.600**	1.493**
			2.650	*4.093*
SN Tax Revenue to GDP			−0.473	−0.668
			−0.664	*−1.053*
Lag Overall SN Deficit to GDP	0.657**	−0.001		
	2.458	*−0.003*		
Cond. Political Central Bankc	2.358**	2.649**	0.450	0.150
	6.110	*6.028*	*1.160*	*0.420*
Cond. SN Government Elected	−1.427**	−0.024	−0.927	1.293
	−1.976	*−0.024*	*−0.744*	*1.447*
Cond. High Transition	−4.715**	−2.588**	0.031	−0.338
	−8.198	*−4.412*	*0.096*	*−1.404*
Cond.Federal State	−0.665	−1.774	−0.105	−2.358**
	−0.905	*−1.629*	*−0.113*	*−2.937*
Cond. Fixed Exchange Rate	0.747	−0.738	0.003	0.191**
	1.041	*−1.018*	*0.023*	*2.484*
Political Central Bank	0.157	0.570**	0.131	0.696**
	0.790	*2.605*	*0.516*	*2.796*
High Transition	1.269**	−0.023	1.355**	1.056**
	2.826	*−0.068*	*2.267*	*2.789*
Lag CPI Inflation	−0.068**	−0.023	−0.075**	0.002
	−3.725	*−1.249*	*−3.108*	*0.107*
Percentage Urban Pop	−0.011	−0.016**	−0.012	−0.021**
	−1.301	*−2.193*	*−1.636*	*−3.030*
1980 GDP Per Capita in US$	0.033	0.218	−0.104	0.051
	0.131	*1.258*	*−0.575*	*0.384*
Real GDP Growth	−0.160**	−0.010**	−0.158**	−0.086**
	−5.876	*−3.334*	*−5.739*	*−3.030*
Adj. R-Squared	0.26	0.15	0.09	0.18
D. W. Statistic	2.24	1.75	2.43	1.98
No. Time Observations	13	13	13	13
No. Cross Section	15	15	15	15

Notes:

a. In all the following regressions, the only variables that are in first difference are the dependent variable and the fiscal explanatory variables, i.e., total expenditure, tax revenue, and deficit.

b. The number in italics represents the t-statistic associated with each coefficient. Furthermore, * indicates significance level of 10 percent, while ** indicates a significance level of 5 percent.

c. The term "conditional" means that the political variable has been multiplied by either the lagged value of the SN Overall Deficit (the case of the first two regressions represented in this table) or by the SN Total Expenditure (the case of the last two regressions).

TABLE 3.2.

Conditional Political Model in First Differences[a]

Developed Countries Estimates[b]

(All dependent variables are net of interest payments)

Dependent Variable	CG Deficit to GDP	CG Exp. to GDP	CG Deficit to GDP	CG Exp. to GDP
Constant	2.955	1.965	1.261	0.355
	0.907	*1.351*	*0.307*	*0.291*
SN Tot Expenditure			1.258*	1.137**
to GDP			*1.880*	*6.861*
SN Tax Revenue			−0.008	−0.047
to GDP			*−0.042*	*−0.203*
Lag Overall SN	0.300	1.110**		
Deficit to GDP	*0.657*	*2.408*		
Cond. Political	1.965**	1.089**	−0.548	−0.114
Central Bankc	*2.668*	*2.518*	*−1.277*	*−0.202*
Cond. SN Government	−0.141	−0.162	−0.034	−0.240
Elected	*−0.207*	*−0.349*	*−0.045*	*−0.988*
Cond.Federal State	0.182	−0.776**	−1.064**	−0.393**
	0.429	*−2.351*	*−3.056*	*−2.018*
Cond. Fixed Exchange	−0.565	−0.629*	0.001	0.007
Rate	*−1.614*	*−1.963*	*0.152*	*1.330*
Political Central	−1.005**	−1.007**	−1.184**	−1.034**
Bank	*−3.351*	*−4.140*	*−4.305*	*−3.692*
Lag CPI Inflation	−0.042	−0.010	−0.043*	−0.055*
	−1.379	*−0.227*	*−1.781*	*−1.755*
Percentage Urban Pop	−0.002	−0.007	−0.003	−0.006
	−0.313	*−1.633*	*−0.585*	*−1.450*
1980 GDP Per	−0.280	−0.088	−0.098	0.049
Capita in US$	*−0.780*	*−0.569*	*−0.215*	*0.371*
Real GDP Growth	−0.177**	−0.276**	−0.149**	−0.216**
	−6.467	*−8.713*	*−4.954*	*−7.140*
Adj. R-Squared	0.23	0.44	0.21	0.51
D. W. Statistic	2.02	1.72	2.13	1.84
No. Time Observations	13	13	13	13
No. Cross Section	17	17	17	17

Notes:

a. In all the following regressions, the only variables that are in first difference are the dependent variable and the fiscal explanatory variables, i.e., total expenditure, tax revenue, and deficit.

b. The number in italics represents the t-statistic associated with each coefficient. Furthermore, * indicates significance level of 10 percent, while ** indicates a significance level of 5 percent.

c. The term "conditional" means that the political variable has been multiplied by either the lagged value of the SN Overall Deficit (the case of the first two regressions represented in this table) or by the SN Total Expenditure (the case of the last two regressions).

tral governments spend more and borrow more to help out subnational governments after they have overspent and run up debt. The significant coefficient on subnational spending in the central government deficit equation reinforces the impression that the relations are often of the unhealthy variety, as in case 3.

Lack of central bank independence in interaction with subnational deficits (lagged) has significantly positive and large (around 2.0) coefficients in both subsamples and for both central primary deficits and central spending. This implies that the central government is much more likely to bailout overindebted subnationals. For the developing countries, lack of central bank independence directly effects central government spending. It is surprising that central bank independence does not affect their deficits as well and that the upper-income countries have negative and usually significant coefficients on the variable for lack of central bank independence when entered by itself.

Subnational borrowing constraints showed no systematic effects in improving fiscal performance of the central government. So the results were not reported. This is not surprising. To the extent that the borrowing constraints work, their effect would already be reflected in the variables for subnational borrowing and spending (although the regressions with subnational spending and deficits as dependent variables do not show significant effects of borrowing constraints). So entering the variable in the equations for central government deficits and spending is mainly asking whether the subnational spending and borrowing and spending that occurs, despite the borrowing constraints, have a less pernicious effect on the center if borrowing constraints are present. Also, fiscal problems at the center as a result of subnational fiscal behavior might cause the introduction of the borrowing constraints—reverse causality.

The variable for elected subnational governments did not have significant coefficients for either a direct effect or an interaction with the subnational spending and deficits. Perhaps this is because there were so few observations of unelected subnational governments.

Major political transitions-coups or transitions to democracy-occurred only in the developing countries in our sample years. The variable by itself has a positive and significant coefficient in the equations for central government primary deficits, but not usually for central spending. So central deficits are higher on average in years of political transition. But the coefficients are significantly negative for the interaction of transitions with subnational deficits, indicating that the subnationals are less likely to get

a bailout in a transition year. This is not surprising, given the distractions of the central government at such a time.

To summarize, whereas in the cross-section regression the steady-state level of subnational borrowing (implicitly sustainable) is not associated with higher central government spending and deficits, when subnational governments increase their borrowing (potentially unsustainable) the central government seems to have to spend and borrow more in the subsequent period. This implies that transitions to decentralization and fluctuations of borrowing by subnationals typically cause problems for macroeconomic management, but evidently many countries with long-standing decentralized public sectors have developed institutions to prevent these problems. Although many of these countries are outside Latin America, the experiences in the region show important positive as well as negative lessons for macroeconomic management in decentralized democracies.

The variable for a fixed exchange—rate regime did not usually have a significant coefficient by itself or in interaction with subnational deficits and spending. When it was significant, the signs were inconsistent. Further study of the role of institutional and political variables seems warranted.

For the economic control variables, there is strong evidence that faster GDP growth lowers both primary expenditure and deficits. This remains true regardless of the model specification or of the sample of countries employed. Also, lagged CPI inflation seems to decrease the central government's primary deficit, and a high percentage of urban population is negatively correlated with central government primary expenditure.

We also ran regressions where net credit from the central bank and net credit from the money deposit banks were included as dependent variables. The tables including these results are not presented because the conclusions are not as clear cut as with the previous regressions. Nonetheless, three preliminary conclusions can be reported. First, increases of subnational expenditure and tax revenue both result in higher net credit from the monetary authority. Second, higher lagged subnational deficits lead to higher net credit from the monetary authority. Finally, net credit from money deposit banks varies positively with subnational expenditure and negatively with subnational tax revenue.

4.2.1.   Causes of subnational spending and deficits.

We also looked to see whether variables reflecting the institutional and economic environment could explain subnational spending and deficits. Table 4 reports the results for the panel data regressions.

TABLE 4.

Unconditional Political Model of Subnational Spending and Deficits
(first differences)^{ab}

(All dependent variables are net of interest payments)

Dependent Variable	Overall Sample		Developing Countries		Developed Countries	
	SN Def. To GDP	SN Exp. to GDP	SN Def. to GDP	SN Exp. to GDP	SN Def. to GDP	SN Exp. to GDP
Constant	−0.059	0.032	−0.212	−0.514**	0.284	1.015**
	−0.419	0.297	−1.195	−1.961	0.602	2.357
Political Central Bank	−0.099**	−0.271**	−0.064	−0.087	−0.216**	−0.455**
	−2.663	−6.330	−1.286	−1.259	−3.753	−6.647
SN Government Elected	−0.020	0.214**	−0.019	0.119	0.102	−0.176
	−0.793	5.166	−0.583	0.931	0.533	−0.797
High Transition	0.089**	0.863	0.085**	0.887		
	3.895	0.670	2.996	0.840		
Federal State	0.011	0.082**	0.021	0.169	−0.010	0.067*
	0.403	2.709	0.614	1.218	−0.231	1.693
Fixed Exchange Rate	−0.053	−0.094**	−0.246	0.174	−0.013	−0.084**
	−1.383	−3.035	−0.332	0.834	−0.289	−1.982
Lag CPI Inflation	−0.003*	−0.006**	−0.003**	−0.008**	−0.001	0.004
	−1.879	−2.111	−2.139	−3.388	−0.535	1.520
Percentage Urban Population	0.001	−0.002**	0.001	−0.002	0.002	−0.002
	1.035	−2.057	0.540	−0.826	1.036	−1.184
1980 GDP Per Capita in US$	0.001	0.012	0.024	0.082	−0.050	−0.041
	0.046	0.606	0.745	1.595	−0.931	−0.982
Real GDP Growth	0.001	−0.026**	0.003**	−0.005**	−0.018**	−0.079**
	0.643	−7.175	4.870	−2.478	−2.719	−6.402
Adj. R-Squared	0.00	0.10	−0.01	0.06	0.01	0.22
D. W. Statistic	2.32	1.79	2.58	2.20	2.23	1.63
No. Time Obs.	13	13	13	13	13	13
No. Cross Section	32	32	15	15	18	18

Notes:

a. In all the following regressions, the only variables that are in first difference are the dependent variable and the fiscal explanatory variables, i.e., total expenditure, tax revenue, and deficit.

b. The number in italics represents the t-statistic associated with each coefficient. Furthermore, * indicates significance level of 10 percent, while ** indicates a significance level of 5 percent.

Three findings stand out. First, countries with high-level political transitions have higher subnational government deficits in the transition years. Second, fixed exchange rates are associated with lower subnational government spending: this is particularly true of developed countries. Finally, lack of central bank independence leads to lower spending and deficits at the subnational level, especially in developed countries. Subnational borrowing constraints (not shown) did not enter significantly in panel data regressions, except that in a 1990-94 subsample, the period for which the borrowing constraint variable is most accurate, it has a significantly positive coefficient, which is consistent with reverse causality, although does not prove it. Of the economic environment variables, inflation and real growth both have a significant negative effect on subnational government spending and deficits.

5. CONCLUSIONS

Although the econometric evidence is primitive in many ways, it gives an unequivocal indication that a problem exists for countries where the subnational spending and borrowing and spending are increasing–subnational spending and deficits can lead to higher spending and deficits at the national level. We can reject the idea that on average subnational governments fiscal policy has no effect on central government fiscal policy. Therefore, the theoretical possibility– complete independence between the central and subnational governments–does not hold in practice for most countries in our sample. On the contrary, our empirical findings indicate that the center is likely to take care of subnational governments when the latter are in fiscal difficulties; or subnational governments are usually facing soft-budget constraints from the center.

We can also reject the hypothesis that the transfers between central and subnational governments are usually determined exogenously by the center. If the center had such a good control of the situation, we would not see the significant coefficients for subnational interest payments and lagged deficits in the equation for central spending. Nor would we see the significant coefficients for subnational fiscal variables in the equation for central government deficits.

Countries seem to develop ways to minimize these problems, for the deficit relationships do not show up in the cross-section analysis. The main potential problem in the long-run, revealed in the cross-section analysis, is that subnational spending financed with transfers or something else other that local taxes tend to increase the overall size of the government.

Having a less independent central bank as indicated by frequent and politically motivated changes of the governor, are associated with increased influence of subnational spending and deficits on the central government's fiscal situation. Central governments in a unitary state are more likely to bailout their subnationals than in a federal public sector. Major political transitions, between authoritarian and democratic regimes, lead to higher central government deficits, on average, but make the central governments less likely to aid the subnationals in that year.

Further research may reveal more explicit links in intergovernmental transfers, by investigating the nature of the linkage and the institutional arrangements that affect the linkage, which make it more or less difficult for subnationals to spend other people's money.

APPENDIX A

TABLE A1.
Countries Included in the Empirical Study

Argentina	Israel
Australia	Luxembourg
Austria	Malaysia
Belgium	Mexico
Bolivia	Netherlands
Brazil	Norway
Canada	Paraguay
Chile	Romania
Colombia	South Africa
Denmark	Spain
France	Sweden
Germany	Switzerland
Iceland	Thailand
India	United Kingdom
Indonesia	United States
Iran	Zimbabwe
Ireland	

TABLE A2.
Central Government Descriptive Statistics.
(Averages of the percentages of GDP between 1980-1994)

Country	Primary Deficit	Overall Deficit	Primary Expenditure	Total Expenditure	Tax Revenue
Argentina	1.40	3.06	13.26	14.92	11.75
Bolivia	−4.08	−2.87	17.13	18.34	8.62
Brazil	−4.16	7.24	24.64	36.05	17.05
Chile	−2.16	−0.72	24.34	25.79	20.36
Colombia	0.48	1.54	12.95	14.01	11.02
India	4.07	7.18	13.01	16.12	10.53
Indonesia	−0.87	1.03	17.99	19.89	16.78
Iran	5.17	5.26	24.27	24.35	7.64
Israel	−2.93	8.93	45.76	57.62	37.32
Malaysia	−0.52	4.91	24.61	30.05	20.84
Mexico	−2.41	5.36	13.49	21.26	14.48
Paraguay	−0.90	−0.27	9.76	10.39	8.89
South Africa	1.26	5.13	26.51	30.38	23.77
Thailand	−1.04	0.93	15.34	17.32	14.84
Zimbabwe	4.33	9.17	31.73	36.57	26.38
Developing Countries	**−0.16**	**3.73**	**20.99**	**24.87**	**16.68**
Australia	−0.66	1.23	23.66	25.54	21.78
Austria	1.63	4.68	36.37	39.42	32.27
Belgium	−0.46	8.52	42.91	51.89	42.45
Canada	0.03	4.07	19.83	23.87	17.67
Denmark	−4.12	1.62	35.02	40.77	33.29
France	0.84	2.80	41.77	43.73	37.65
Germany	0.07	1.67	29.63	31.23	28.06
Iceland	0.32	3.02	27.28	29.98	23.84
Ireland	−0.47	7.50	38.67	46.64	35.15
Luxembourg	−2.43	−1.98	42.35	42.79	40.24
Netherlands	0.12	4.28	50.43	54.58	44.38
Norway	−2.32	0.44	39.10	41.86	36.60
Spain	2.53	5.05	30.59	33.12	26.41
Sweden	0.63	6.03	38.09	43.49	33.85
Switzerland	0.23	0.85	22.01	22.63	19.56
United Kingdom	−0.90	2.68	35.71	39.29	32.56
United States	0.67	4.03	20.36	23.71	18.14
Developed Countries	**−0.25**	**3.32**	**33.75**	**37.33**	**30.82**
Overall	**−0.21**	**3.51**	**27.77**	**31.49**	**24.19**

TABLE A3.
Central Government Descriptive Statistics.
(Min and Max of the percentages of GDP between 1980-1994)

Country	Primary Deficit		Overall Deficit		Primary Expenditure		Total Expenditure		Tax Revenue	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Argentina	−1.73	9.51	−0.62	11.84	8.72	19.05	9.42	22.41	8.47	14.87
Bolivia	−32.93	1.16	−32.15	3.56	10.42	34.75	11.12	35.54	3.91	11.64
Brazil	−20.59	2.43	0.45	16.06	7.61	15.58	15.58	37.37	14.49	19.78
Chile	−6.18	1.58	−5.39	2.97	18.39	33.57	20.33	34.10	16.21	25.50
Colombia	−5.08	3.86	−3.94	4.72	10.26	15.13	11.49	15.99	8.94	14.01
India	1.54	6.33	5.46	9.28	11.30	14.73	13.02	17.93	9.51	11.33
Indonesia	−3.02	1.43	−1.36	3.55	14.40	23.60	16.41	24.39	14.29	20.30
Iran	0.19	13.27	0.20	13.80	17.70	35.18	17.71	35.71	5.88	9.12
Israel	−14.59	8.97	−0.69	25.10	29.16	62.27	35.38	84.57	23.66	46.28
Malaysia	−8.21	11.81	−4.48	16.14	20.85	34.88	24.57	38.43	17.05	23.52
Mexico	−8.24	7.66	−4.56	14.20	10.45	22.60	15.74	30.26	13.07	15.28
Paraguay	−3.87	1.44	−2.93	1.90	7.57	12.60	8.10	13.52	7.76	10.01
South Africa	−4.20	4.45	0.23	10.15	20.30	32.23	22.12	37.92	19.88	27.87
Thailand	−6.37	4.39	−4.70	6.36	11.95	18.20	14.04	20.47	12.66	17.59
Zimbabwe	1.20	8.56	5.90	15.02	26.69	36.71	29.35	43.64	19.21	29.51
Developing Countries	**−7.47**	**5.79**	**−3.24**	**10.31**	**15.05**	**27.40**	**17.63**	**32.82**	**13.00**	**19.77**
Australia	−4.01	2.14	−2.07	3.69	21.04	26.49	22.73	27.98	19.59	23.93
Austria	−0.16	3.72	3.08	5.98	34.81	37.50	37.36	41.24	31.58	33.51
Belgium	−5.16	5.69	4.51	13.32	38.11	49.55	48.16	56.40	40.88	43.77
Canada	−2.38	2.94	2.25	6.54	17.55	21.51	21.29	25.56	16.14	19.20
Denmark	−11.47	3.45	−4.51	8.08	31.33	38.94	38.13	44.00	30.63	36.55
France	−0.99	2.87	0.07	5.67	38.67	44.27	39.50	47.06	36.64	38.35
Germany	−1.31	1.18	0.16	2.50	27.98	31.68	29.45	33.82	26.95	30.21
Iceland	−1.03	1.94	0.70	5.05	22.80	31.24	25.53	34.37	21.80	26.18
Ireland	−6.54	7.35	0.98	14.83	31.61	44.16	39.23	53.12	32.24	37.33
Luxembourg	−10.23	9.69	−9.62	9.85	36.28	46.65	36.62	47.07	37.86	44.29
Netherlands	−4.34	4.37	0.50	7.62	47.24	54.02	51.65	57.72	42.84	46.45
Norway	−6.86	4.83	−3.65	7.38	34.10	45.73	36.76	48.29	34.67	39.34
Spain	−0.62	6.49	2.25	8.29	26.42	35.05	26.67	39.41	21.68	29.94
Sweden	−6.16	10.99	−1.84	16.07	35.06	46.81	39.32	51.89	29.41	38.39
Switzerland	−0.67	2.04	−0.11	2.80	18.71	26.32	19.27	27.09	18.10	21.19
United Kingdom	−5.19	3.64	−1.55	6.47	30.60	40.63	33.95	43.33	30.61	33.82
United States	−0.73	2.77	2.59	5.97	19.48	21.66	22.02	25.25	17.13	19.13
Developed Countries	**−3.99**	**4.48**	**−0.37**	**7.65**	**30.11**	**37.78**	**33.39**	**41.39**	**28.75**	**33.03**
Overall Average	**−5.62**	**5.09**	**−1.71**	**8.90**	**23.05**	**32.91**	**26.00**	**37.37**	**21.37**	**26.82**

TABLE A4.
Sub-National Government Descriptive Statistics.
(Averages of the percentages of GDP between 1980-1994)

Country	Primary Deficit	Overall Deficit	Primary Expenditure	Total Expenditure	Tax Revenue
Argentina	2.78	2.92	9.00	9.15	5.44
Bolivia	−0.13	−0.07	3.13	3.19	2.00
Brazil	0.82	1.71	12.04	12.93	6.76
Chile	0.15	0.15	2.39	2.39	0.75
Colombia	0.07	0.15	5.82	5.90	2.18
India	1.80	2.92	12.28	13.40	5.36
Indonesia	−0.04	−0.04	2.51	2.52	0.41
Iran	0.00	0.00	0.98	0.98	0.60
Israel	0.20	0.69	6.30	6.79	1.85
Malaysia	0.30	0.30	7.13	7.13	0.76
Mexico	0.28	0.28	4.08	4.08	3.12
Paraguay	0.03	0.03	0.39	0.39	0.16
South Africa	0.11	0.46	8.85	9.20	1.51
Thailand	−0.10	−0.10	1.54	1.54	0.79
Zimbabwe	0.13	0.86	8.12	8.85	1.10
Developing Countries	**0.43**	**0.68**	**5.64**	**5.90**	**2.19**
Australia	−0.96	0.62	16.12	17.70	5.54
Austria	−0.38	0.22	16.62	17.22	9.02
Belgium	−0.52	0.48	5.98	6.98	2.18
Canada	0.17	3.15	28.49	32.06	17.46
Denmark	−0.24	0.15	32.15	32.54	14.39
France	−0.26	0.54	8.11	8.92	3.74
Germany	0.06	1.34	20.93	22.21	11.35
Iceland	−0.09	0.32	8.61	9.02	6.33
Ireland	0.07	1.15	13.81	14.90	0.88
Luxembourg	0.01	0.39	7.19	7.57	2.76
Netherlands	−1.43	0.94	15.62	18.00	1.26
Norway	0.01	0.91	19.51	20.41	9.05
Spain	0.23	0.72	10.07	10.56	3.71
Sweden	0.04	0.76	24.69	25.41	15.48
Switzerland	−0.27	0.86	22.42	23.54	12.09
United Kingdom	−0.95	0.20	11.72	12.87	3.17
United States	−1.35	−0.91	17.70	18.15	8.99
Developed Countries	**−0.35**	**0.70**	**16.45**	**17.53**	**7.49**
Overall	**0.02**	**0.69**	**11.38**	**12.08**	**5.01**

TABLE A5.
Sub National Government Descriptive Statistics.
(Min and Max of the percentages of GDP between 1980-1994)

Country	Primary Deficit		Overall Deficit		Primary Expenditure		Total Expenditure		Tax Revenue	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Argentina	0.65	6.17	0.80	6.24	7.13	10.27	7.14	10.43	2.15	8.48
Bolivia	−0.98	0.45	−0.87	0.48	1.36	5.88	1.50	5.94	1.27	2.83
Brazil	0.04	1.84	0.52	3.02	3.70	18.11	4.55	19.50	4.93	9.04
Chile	−0.12	1.31	−0.12	1.31	1.08	3.44	1.08	3.45	0.52	0.94
Colombia	−0.55	0.46	−0.44	0.56	5.11	6.54	5.20	6.64	1.94	2.31
India	0.47	2.55	2.24	3.38	11.14	13.06	11.74	14.40	4.72	5.95
Indonesia	−0.32	0.19	−0.30	0.19	2.02	3.12	2.03	3.13	0.31	0.52
Iran	−0.08	0.05	−0.08	0.05	0.80	1.35	0.80	1.35	0.47	0.72
Israel	−0.32	0.91	0.02	2.07	4.93	7.05	5.14	8.21	0.95	2.40
Malaysia	−1.34	2.38	−1.34	2.38	5.35	8.31	5.35	8.31	0.64	0.86
Mexico	−0.09	0.77	−0.09	0.77	3.16	6.80	3.16	6.80	2.57	3.68
Paraguay	0.00	0.06	0.00	0.06	0.18	0.57	0.18	0.58	0.07	0.27
South Africa	−0.31	0.56	0.08	0.99	6.84	16.61	7.03	16.84	1.14	2.38
Thailand	−0.22	0.00	−0.22	0.00	1.08	3.52	1.08	3.52	0.65	0.96
Zimbabwe	−0.45	0.91	0.32	1.76	5.08	12.91	5.53	13.76	0.96	1.66
Developing Countries	**−0.24**	**1.24**	**0.03**	**1.55**	**3.93**	**7.84**	**4.10**	**8.19**	**1.55**	**2.87**
Australia	−2.20	−0.33	−0.43	1.35	14.30	17.86	15.50	19.82	4.59	6.88
Austria	−0.90	0.34	−0.35	0.80	15.95	18.20	16.61	18.61	8.54	10.06
Belgium	−1.34	0.57	−0.17	1.91	5.09	7.24	5.92	8.58	1.85	2.46
Canada	−1.87	3.31	1.22	6.49	26.75	31.39	29.70	35.77	16.65	18.22
Denmark	−1.74	0.41	−1.31	0.74	29.96	35.13	30.31	35.69	13.55	15.35
France	−0.59	0.39	0.21	1.07	7.12	9.17	7.75	10.01	2.93	4.41
Germany	−1.03	1.29	0.25	2.46	18.09	23.33	19.22	24.57	10.18	12.01
Iceland	−0.91	0.47	−0.64	0.88	7.62	9.94	7.89	10.35	5.80	7.00
Ireland	−1.00	1.53	−0.38	2.99	11.44	15.57	11.89	17.50	0.78	1.16
Luxembourg	−0.86	2.28	−0.35	2.51	5.77	8.61	6.16	9.08	2.18	3.33
Netherlands	−2.79	1.22	−0.12	3.52	13.78	17.37	15.66	20.25	0.84	1.63
Norway	−1.24	2.35	−0.46	3.00	17.32	21.65	18.15	22.72	8.08	9.70
Spain	−0.26	1.08	0.04	1.77	3.11	15.56	3.28	16.54	2.18	4.47
Sweden	−0.59	2.63	0.11	3.17	22.96	26.00	23.54	26.91	14.20	18.70
Switzerland	−1.36	0.86	−0.29	2.00	21.27	24.09	22.40	25.38	11.31	12.62
United Kingdom	−1.80	−0.19	−0.82	1.13	11.17	12.44	12.19	13.70	1.22	4.39
United States	−1.83	−0.75	−1.36	−0.24	16.18	19.82	16.56	20.32	8.14	9.67
Developed Countries	**−1.31**	**1.03**	**−0.29**	**2.09**	**14.58**	**18.43**	**15.46**	**19.75**	**6.65**	**8.36**
Overall	**−0.81**	**1.13**	**−0.14**	**1.84**	**9.59**	**13.47**	**10.13**	**14.33**	**4.26**	**5.78**

REFERENCES

Alesina, Alberto and Roberto Perotti, 1994, The political economy of budget deficits. *NBER Working Paper* **4637**. Cambridge, Mass.

Bahl, Roy, W. and Johannes F. Linn, 1992, *Urban Public Finance in Developing Countries*. New York: Oxford University Press.

Cukierman, Alex and Steven Webb, 1995, Political influence of the central bank: International evidence. *The World Bank Economic Review* **3**, 397-423.

Davoodi, Hamid and Heng-fu Zou, 1998, Fiscal decentralization and economic growth: A cross-country study. *Journal of Urban Economics* **43**, 244-257.

Dillinger, William, 1997, Brazil's state debt crisis: Lessons learned. *Economic Notes* **14**, The World Bank, Latin American and the Caribbean Region, Washington, DC.

Dillinger, William and Steven Webb, 1999, Fiscal management in federal democracies: Argentina and Brazil. *Policy and Research Working Paper* **2121**, The World Bank, Washington, DC.

Dillinger, William, Guillermo Perry, and Steven B. Webb, 2000, Macroeconomic management in decentraliced democracies: The quest for hard budget constraints in Latin America. In *Annual World Bank Conference on Development: Latin America and the Caribbean 1999*, Shahid Burki and Guillermo Perry, eds., The World Bank, Washington, DC.

Europa World Year Book. 1995. Europa Publications Limited, London, England.

Fukasaku, Kiichiro and Luiz R. de Mello Jr., 1997, Fiscal decentralization and macroeconomic stability: The experience of large developing and transition economies. In *Democracy, Decentralization, and Deficits in Latin America*. K. Fukasaku and R. Hausmann, eds., IDB-OECD.

IDB, 1997, *Can Decentralized Democracy Deliver Fiscal Stability? The Institutional Dimension*. Washington, DC.

Inman, Robert and Daniel Rubinfeld, 1997, Rethinking federalism. *Journal of Economics Perspectives* **4**, 43-64.

Oates, Wallace, 1972, *Fiscal Federalism*. New York: Harcourt Brace Jovanovich.

Oates, Wallace, 1985, Searching for Leviathan: An empirical analysis. *American Economic Review* **75**, 748-757.

Pasha, Hafiz, 1997, *Fiscal Decentralization: Lessons from the Asian Experience*. The World Bank, processed.

Prud'homme, Remy, 1995, On the dangers of decentralization. *The World Bank Research Observer* **10(2)**, 201-220.

Shah, Anwar, 1994, The reform of intergovernmental fiscal relations in developing and emerging market economies. *The World Bank Policy and Research Series* **23**, Washington, DC.

Stepan, Alfred, 1997, Toward a comparative theory of federalism. All Soul's College, Oxford University Press.

Stein, Ernesto, 1997, Fiscal decentralization and government size in Latin America. In *Democracy, Decentralization, and Deficits in Latin America*, K. Fukasaku and R. Hausmann, eds., IDB-OECD.

Tanzi, Vito, 1996, Fiscal federalism and decentralization: A review of some efficiency and macroeconomic aspects. In *Annual World Bank Conference on Development Economics*. 1995. The World Bank, Washington DC.

Ter-Minassian, Teresa. (Ed.) 1997. *Fiscal Federalism in Theory and Practice.* IMF, Washington, DC.

Ter-Minassian, Teresa and Jon Craig, 1997, Control of subnational borrowing. In *Fiscal Federalism in Theory and Practice.* Teresa Ter-Minassian, ed., IMF, Washington, DC.

Tiebout, Charles, 1956, A pure theory of local expenditures. *Journal of Political Economy* **64**, 416-424.

Weingast, B., 1997, Political foundations of democracy and the rule of law. *American Political Science Review* **91**, 245-263.

World Bank, 1997. *World Development Indicators.* Washington, DC.

Zhang, Tao and Heng-fu Zou, 1998, Fiscal decentralization, public spending, and economic growth in China. *Journal of Public Economics* **67**, 221-40.