IMF Staff Papers
Vol. 53, No. 3

How Should Subnational Government Borrowing Be Regulated? Some Cross-Country Empirical Evidence

ALEXANDER PLEKHANOV and RAJU SINGH*

Countries have adopted various institutional responses to subnational government borrowing. Using a sample of 43 countries over the period 1982–2000, this paper provides a panel data analysis to determine the most effective borrowing constraints for containing local fiscal deficits. The results suggest that no single institutional arrangement is superior under all circumstances. The appropriateness of specific arrangements depends on other institutional characteristics, particularly the degree of vertical fiscal imbalance, the existence of any bailout precedent, and the quality of fiscal reporting. [JEL H74, H77]

Over the past few decades, countries around the world have gradually moved toward the greater decentralization of fiscal revenue and spending responsibilities. As a result, subnational economic policies have taken an increasingly important role in ensuring macroeconomic stability. National governments have adopted different institutional responses to the difficulties of decentralized decision making, especially addressing the need to improve policy coordination across levels of government and contain subnational borrowing.

*Alexander Plekhanov is an Economist in the Fiscal Affairs Department of the IMF, and Raju Singh is a Senior Economist in the Asia and Pacific Department of the IMF. This paper was prepared while Mr. Plekhanov was a summer intern and Mr. Singh a Senior Economist in the IMF Fiscal Affairs Department. The authors are grateful to Nicoletta Battini, Jeremy Edwards, Thomas Helbling, Anwar Shah, and an anonymous referee for their comments and suggestions, and to Jamal Ismayilov for excellent research assistance.

Various case studies have identified different approaches to controlling subnational borrowing, but none has indicated which institutional arrangement is the most successful. Furthermore, only a few papers have conducted cross-country empirical analysis, and even these few focused on the presence of borrowing constraints rather than on their specific design.

This paper attempts to bridge the gap with a cross-country analysis of a large sample of countries. It focuses on the impact on subnational budget deficits of different approaches to controlling subnational government borrowing, and attempts to identify the determinants of the effectiveness of each institutional arrangement.

I. Institutional Framework

Sources of Subnational Fiscal Indiscipline

Wildasin (2004) argues that if intergovernmental transfers are costless and borrowing costs are the same across all tiers of government, the intergovernmental structure of borrowing does not matter. However, there are several reasons to believe that intergovernmental transfers do cost, and that subnational governments may be more inclined to overspend, undertax, and borrow excessively than national governments. These reasons may arise from the common pool problem, soft budget constraints, interregional competition, unfunded federal mandates, or short electoral cycles.

Common pool

The common pool problem stems from the separation of the costs and benefits of public spending. If a public project benefits predominantly a particular jurisdiction but receives financing through a common pool of taxes from the whole country, the jurisdiction pays only a small fraction of the costs of the project while enjoying a large share of its benefits. The lack of full responsibility for the costs of a project results in excessive spending[1] and creates a clear incentive for regions to compete for federal transfers that enable them to finance region-specific projects out of a common pool. This competition can take various forms. Ideally, regions would compete on the basis of the quality of their proposed spending projects. Less ideally, they could signal that they are in particular need of federal assistance by running large budget deficits or accumulating unsustainable debts, and hope that central government grants would eventually bail them out.

Soft budget constraints

The possibility of a bailout does not stem from the existence of a common pool per se, but from the way it functions. When transfers are based on ex post financial needs rather than ex ante characteristics, the central government can bail out regions

[1]See also Weingast, Shepsle, and Johnsen (1981), who show that bargaining in a legislature comprised of regional representatives will lead to overprovision of spending programs with benefits concentrated in particular regions.

experiencing financial difficulties. In this case, the budget constraint faced by the subnational government becomes “soft”: if regional authorities undercollect taxes, overspend, or default on the debt, they expect the federal government to cover the gap between actual and “affordable” expenditure. Moreover, lenders also lose incentive to police regional governments because they view their investments as protected by a federal government guarantee.[2]

These problems would not exist if central governments could commit credibly to never revising transfer allocations ex post, that is, to a no-bailout policy. Although such a policy stance may be optimal in the long run, it is difficult to commit to in the short run, especially if it involves a painful local default or a reduction in the provision of basic public services—schools closed or pensions unpaid. Persson and Tabellini (1996) and Bordignon, Manasse, and Tabellini (2001) show formally that a national government is likely to find it beneficial to bail out a financially distressed region to maximize the federation’s social welfare. In addition, a default by one region can increase the cost of borrowing for all other regions in a federation, so neighbor regions may be interested in providing the defaulting region with a bailout transfer.

Interregional competition

If regions actively compete for mobile capital and labor, their rivalry may reduce the overall tax burden and enhance fiscal discipline. At the same time, such competition may encourage regions to set inefficiently low tax rates or spend excessively on infrastructure projects financed by borrowing. Cai and Treisman (2004) suggest that if regional governments are in charge of only tax collection and cannot vary tax base or tax rates, they may have the incentive not to enforce tax collection on their territory, thus reducing the de facto tax burden in the region.

On the other hand, if regions share the same tax base with the federal government, and both tiers of government have tax-setting powers, the equilibrium level of taxation is likely to be excessive because neither government fully internalizes the negative effect of raising tax rates on the tax base (Keen, 1998; and Keen and Kotsogiannis, 2002). Thus, inefficiencies at the subnational level may arise under different decentralization arrangements.

Unfunded federal mandates

In 1992, a ruling of the German Federal Constitutional Court obliged the federal government to provide supplementary transfers (de facto bailouts) to the Länder of Saarland and Bremen (Wurzel, 1999). The court agreed that most of the expenditure of the distressed jurisdictions was mandated constitutionally, even though the federal funding allocated to the regions had been insufficient to finance the mandatory expenditure.

[2]For a more detailed discussion of soft budget constraints and their consequences, see Kornai, Maskin, and Roland (2003).

Such rulings create the sense that regional authorities are not responsible if federal mandates are initially incompatible with sustainable fiscal policies. This may result in a lack of incentive for sound public expenditure management at the regional level, widespread bailout expectations, and soft budget constraints for subnational governments. Moreover, voters will not hold subnational officials responsible for disparities between revenue assignments and expenditure responsibilities, blaming the central government instead. Therefore, electoral accountability will no longer discipline subnational governments.

Short electoral cycles

If voters are unable to take into account the costs of public spending, governments can gain political credit by increasing spending or cutting taxes before the elections. Politicians with short planning horizons may not fully internalize the future costs of borrowing. Besley and Case (1995) empirically confirm that fiscal preferences of incumbents eligible for reelection differ from those of "lame ducks." This factor is not unique to subnational governments; short political cycles undermine the central government's fiscal discipline as well.[3]

The Role of Vertical Fiscal Imbalances

Oates (1972) argued that decentralizing public spending leads to increased efficiency. Local governments can better assess the needs of local communities, match diverse preferences, and therefore allocate resources more efficiently than the central government can. In addition, local governments also have the information necessary to select more cost-effective projects.

Decentralized spending, however, creates a gap between the subnational governments' own revenue from local property taxes and their expenditure responsibilities. This gap, filled by federal transfers from centralized tax revenues, is referred to as a vertical fiscal imbalance, usually measured as the ratio of transfers to total subnational government revenue.

Vertical fiscal imbalances tend to exacerbate the moral hazard and adverse incentives created by the common pool problem, soft budget constraints, and other factors discussed earlier, leading to poor subnational fiscal discipline and the need to control subnational borrowing. A high vertical fiscal imbalance implies a high proportion of regional spending financed from the common pool and soft budget constraints for subnational governments, if transfers serve the purpose of closing a subnational fiscal deficit regardless of the reasons underlying the mismatch between subnational government revenue and expenditure. Moreover, subnational governments with high vertical fiscal imbalances can argue that the central government is to blame for subnational budget deficits or failure to repay subnational debt. Even tax competition can take more distortionary forms in the presence of high vertical fiscal imbalances: Cai and Treisman (2004) present several cases from China,

[3]See Alesina and Perotti (1995) for empirical evidence and discussion.

Russia, and the United States where regional authorities have tried to attract private investment by protecting local enterprises from federal tax collectors.

Classification of Controls

Faced with these challenges, countries have adopted various institutional approaches to contain subnational borrowing. Following Ter-Minassian (1997b), these approaches have usually been grouped into four broad categories: market discipline, administrative constraints, rule-based controls, and cooperative arrangements.

Market discipline

Some countries rely on capital markets to contain subnational borrowing. In this case, the central government does not set any limits on subnational borrowing, and local governments are free to decide how much to borrow, from whom to borrow, and on what to spend the borrowed money. Subnational governments may also decide by themselves to adopt a fiscal rule in an attempt to enhance their credit standing in the market. Such self-imposed rules exist in Canada, Switzerland, and the United States.

As Lane (1993) points out, however, several conditions are necessary for financial markets to exert effective discipline over subnational borrowing. First, markets should be free and open, with no regulation on financial intermediaries that could place subnational governments in a privileged-borrower position (for example, portfolio composition requirements). Second, adequate information on the borrower's outstanding debt and repayment capacity should be available to potential lenders. Third, there should be no perceived chance of a bailout by the central government in a case of impending default. Finally, the borrower should have institutions ensuring adequate policy responsiveness to market signals.

Administrative constraints

In several countries, the central government is empowered with direct control over subnational borrowing. This control may take various forms, including the setting of annual (or more frequent) limits on the overall debt of individual subnational jurisdictions (as in Lithuania since 2001), special treatment or prohibition of external borrowing (as in Mexico), review and authorization of individual borrowing operations (including approval of the terms and conditions, as in India or Bolivia), or the centralization of all government borrowing with on-lending to subnational governments (as in Latvia and Indonesia).

Administrative procedures introduce strict controls over subnational borrowing while preserving a flexible fiscal policy. They also ensure some coordination of the country's external borrowing, closely linking it to other macroeconomic policies. However, the implied approval of individual spending and borrowing initiatives of subnational governments by the central government introduces an explicit or implicit guarantee of local and regional public debt. Having granted permission, the federal government may find it more difficult to refuse a bailout later on, should the regional government run into trouble.

Imperfect information on local investment projects and local needs introduces a further drawback. Although subnational governments can potentially select the most necessary and cost-efficient spending programs, central authorities lacking the necessary information will select only “average” quality ones. Moreover, perceiving their borrowing as guaranteed by the central government, local administrations may be inclined to submit any project for central government approval, regardless of its quality and risk, because in the worst case, the losses will be covered out of the common resource pool.

Rule-based controls

The central government can also try to contain subnational borrowing by imposing a fiscal rule. Both federal and unitary states have relied on standing rules specified in the constitution or in laws to control subnational borrowing, in an effort to confer credibility on the conduct of macroeconomic policies. Such rules introduce a constraint on fiscal policy to guarantee that fundamentals will remain predictable and robust regardless of the government in charge. Rules may take the form of restrictions on overall budget deficits (Austria, Spain), operating budget deficits (Norway), indicators of debt-servicing capacity (Spain, Japan, Brazil, Korea), level of accumulated subnational debt (Hungary), or level of spending (Belgium, Germany). Alternatively, “golden rules” establish no ceilings, but limit borrowing to investment purposes (Germany).

Fiscal rules are attractive because they may be clear, transparent, and relatively easy to monitor. Easily understood by economic agents, rules may also improve the credibility of fiscal policy. The main disadvantage of the rule-based approach is a subtle trade-off between ensuring compliance and preserving flexibility. Strict fiscal rules with universal coverage leave little room for maneuver in case of unexpected economic downturns, whereas flexible fiscal rules with escape clauses lack credibility and fail to impose sufficient discipline when they are easy to circumvent in practice.

Furthermore, if restrictions apply only to current balances, expenditure can be reclassified from current to capital (see case studies in Ter-Minassian, 1997b). If restrictions do not apply to off-budget items or semigovernmental organizations (such as enterprises owned by local governments), debt can quickly accumulate off budget. For example, when Australia relaxed restrictions on the finances of subnational semigovernmental authorities in 1982, the debt of regional public enterprises tripled over the next two years, and the decision was eventually reversed in 1984 (Craig, 1997).

In Denmark and Hungary, local governments used sale-and-lease-back operations to circumvent borrowing restrictions, forcing the Danish central government to revise the definition of borrowing to include renting and leasing arrangements (Jørgen and Pedersen, 2002). Local governments in the United States earlier exploited lease-arrangement schemes (Granof, 1984). Ahmad, Singh, and Fortuna (2004) argue that even in China, where regional governments must run balanced budgets and generally cannot borrow, provincial authorities managed to accumulate substantial “hidden” off-budget debts.

Cooperative arrangements

Under the cooperative approach, variations of which exist in several European countries and Australia, a negotiation process between the federal and the lower levels of government designs subnational borrowing controls. Subnational governments are actively involved in formulating macroeconomic objectives and the key fiscal parameters underpinning these objectives, thus becoming jointly responsible for their achievement. This process leads to an agreement on the overall deficit targets for the general government, as well as on the main items of revenue and expenditure. Specific limits are then agreed upon for the financing requirements of individual subnational jurisdictions.

In Australia, a loan council coordinating the fiscal policies and borrowing decisions of Australian states was set up in 1929. The council currently comprises treasurers or heads of government of each state and the commonwealth treasurer, who presides over deliberations. The council is in charge of analyzing and approving financing requirements of each state and of the commonwealth as a whole, as well as monitoring the execution of the decisions.

The main strength of the cooperative approach is that it combines many individual advantages of the other three approaches. By promoting a dialogue between the tiers of government, it has the potential to ensure the coordination of macroeconomic policy while retaining sufficient flexibility. It raises awareness among subnational governments of the macroeconomic implications of their budgetary choices. Finally, it does not automatically imply a central government guarantee for subnational borrowing.

However, its hybrid nature is also its main weakness. When poorly implemented, cooperative arrangements produce the flaws of other approaches, instead of their advantages. They may undermine the leadership of the central government, soften subnational government budget constraints, promote bargaining for federal transfers, and hamper policy coordination. By trying to deal with all the challenges simultaneously, the cooperative approach may end up dealing effectively with none.

Empirical Evidence

What has the evidence been up to now? After reviewing several case studies, Ter-Minassian and Craig (1997) were the first to classify subnational borrowing constraints. They recognize that reliance solely on market discipline for containing subnational borrowing is not likely to be successful. More generally, they suggest that a rule-based approach to controlling debt appears to be preferable to administrative controls in terms of transparency and certainty. They also suggest that cooperative arrangements could be a promising new development to involve subnational governments in formulating and implementing medium-term fiscal adjustment programs, thus encouraging budgetary responsibility.

Ter-Minassian, Albino-War, and Singh (2004) arrive at similar conclusions by examining differences in average subnational fiscal outcomes in 15 countries having different subnational borrowing regimes. They conclude that self-imposed fiscal rules tend to be associated with better fiscal outcomes, reflecting a greater subnational commitment to fiscal soundness. This approach worked best when there was little experience of bailouts. However, the analysis of simple averages does not control for numerous factors that affect subnational fiscal balances (for example, vertical fiscal imbalance) and thus needs to be refined.

Rodden and Eskeland (2003) summarize other case studies, emphasizing that either strong hierarchical oversight or strong market mechanisms must be in place to contain subnational borrowing effectively. In contrast, Rattsø (2002), reviewing the experience of European countries, notes that decentralized governments can achieve fiscal stability in different ways and concludes that all the countries considered have been successful in avoiding serious fiscal imbalances.

The econometric evidence of the impact of borrowing constraints on subnational fiscal policy has been, so far, limited and mixed. In a sample of 30 countries, von Hagen and Eichengreen (1996) observe that the introduction of borrowing constraints increases subnational indebtedness. However, this dependence may not be causal; their regression does not control for factors other than GDP. Fornasari, Webb, and Zou (2000) found that constraining subnational borrowing did not seem to have any consistent effect on subnational fiscal deficits in a panel of 31 countries. Jin and Zou (2002) found similar results in 32 countries for the size of subnational governments. In contrast, Rodden (2002), using panel data on 33 countries, concluded that the largest deficits are run by subnational governments that rely heavily on federal transfers and at the same time are free to borrow.

The methodology of the studies has evolved over time. Whereas von Hagen and Eichengreen (1996); Fornasari, Webb, and Zou (2000); and Jin and Zou (2002) used a dummy for the presence of controls, Rodden (2002) used a quasi-continuous index to reflect the degree of borrowing autonomy. This index, initially suggested by the Inter-American Development Bank (IDB, 1997), is a rational number between 1 and 5; it takes into account institutional features, such as whether every new debt requires explicit authorization by the upper-tier government, whether formal limits are in place, and whether subnational governments own banks and public enterprises. A major advantage of this approach is its ability to compress information about subnational borrowing autonomy into a single index, preserving degrees of freedom for the statistical analysis. The disadvantage is that it focuses exclusively on the impact of the *degree* of borrowing autonomy on fiscal outcomes and cannot show the *types* of borrowing constraints that perform better. In other words, it confirms that subnational borrowing should be controlled (at least in the countries with high vertical fiscal imbalances), but cannot suggest how.

II. Empirical Analysis

Data

This paper tries to assess whether the design of subnational borrowing controls leads to particular fiscal outcomes, measured as the aggregate subnational fiscal balance–to-revenue ratio. We focus on the long run, analyzing the impact of institutional features and federal arrangements on average long-run subnational and consolidated fiscal balances.

Table 1. Subnational Borrowing Controls: Summary
(Number of observations)

Regime	Total	Emerging	Industrial	With Bailout History	Without Bailout History
Unrestricted	13	5	8	6	7
Self-imposed rules	3	1	2	1	2
Centrally imposed rules	12	6	6	6	6
Administrative	14	12	2	7	7
Cooperative	8	2	6	4	4
Total	**50**	**26**	**24**	**24**	**26**

Sources: See Appendix.

This paper uses a newly collected data set on the subnational borrowing regimes and fiscal outcomes of 43 countries (industrial and emerging, federal and unitary) in the period 1982–2000. The data come mostly from the IMF *Government Finance Statistics* (GFS).[4] Unless otherwise indicated, the first level of subnational government provides the data for each country.[5]

We classified all countries according to the design of their subnational borrowing controls (see Table 1) and identified regime changes, if any. If countries changed their subnational borrowing regime during the period for which data are available (for example, Germany or Hungary), we included them in two different cross-sectional units so that each subperiod (before the regime change and after the regime change) could provide an unambiguous measure of subnational borrowing controls. For countries using several institutional features simultaneously, the classification has tried to emphasize the predominant approach, even though the institutional framework governing intergovernmental fiscal relations is complex and the grouping of countries may not always be clear cut (details are presented in Appendix Table A.1). Moreover, because of data constraints, the constructed panel is unbalanced, and fewer countries represent certain specifications.

In addition to borrowing regimes, we identified bailout precedents, as a proxy for enforcement of rules in practice. A country was considered to have a bailout history if significant bailouts of subnational governments had taken place in the past.[6]

[4]Individual data sources are listed in the Appendix. GFS data on transfers may not always be consistent across countries. In some cases, shared revenues are classified as transfers, whereas in others they are coded as the subnational government's own revenue. There may thus be a problem measuring vertical fiscal imbalances. However, comparing measures of this variable constructed using GFS and a number of other sources (IDB, 1997; and OECD, 1999 and 2000) revealed differences for only a few countries.

[5]If subnational government comprises multiple tiers, the first level refers to the provincial (regional, state) governments. The results do not change qualitatively if data on consolidated subnational government are used instead. However, consolidated data were not available for all countries.

[6]In principle, one should also take into account subnational governments' access to implicit borrowing via government-controlled banks and enterprises. Unfortunately, such data were not available for many countries in the sample.

Control Variables

Numerous factors indirectly related to the design of subnational borrowing constraints may also affect subnational fiscal balances and thus need to be controlled for.

1. *Degree of fiscal decentralization:* A higher degree of fiscal decentralization (proxied by the share of subnational government expenditure in general government expenditure) can lead to inferior fiscal outcomes because it hampers macroeconomic coordination, or it may reflect the central government's attempt to shift part of the fiscal burden onto subnational governments.
2. *Common standards of public expenditure management:* Common standards for subnational governments' budgeting and financial reporting facilitate the monitoring of their budget execution, making the enforcement of rules more effective. Von Hagen and Harden (1994) and Poterba and von Hagen (1999) confirmed that transparent budget procedures contributed to improving fiscal discipline in the 1980s and early 1990s. This study uses a dummy variable for the presence of common standards.
3. *Governance features:*
   - Corruption (measured using a survey-based perception index) may have an (indirect) negative effect on subnational fiscal discipline, insofar as it is associated with weak fiscal institutions.
   - Central bank independence (measured by Cukierman's (1992) index) imposes a harder budget constraint on all levels of government and may improve fiscal outcomes.
4. *Cost of debt service:* Lower real interest rates, higher inflation, and lower debt-service spending (measured by the ratio of debt-servicing expenditure to gross national income) make borrowing cheaper and thus may encourage higher budget deficits.
5. *Political variables:*
   - A dummy variable for parliamentary democracies: Persson and Tabellini (2003) found evidence of significant differences in the fiscal behavior of governments in presidential and parliamentary democracies.
   - A dummy variable for regional representation in the upper chamber of parliament: Rodden (2002) pointed out that an upper chamber of parliament composed of regional representatives increased the veto power of the regions, negatively affecting fiscal discipline.
   - The Herfindahl index of political fractionalization: Rodden (2002) found that political cohesion contributed to improving subnational fiscal outcomes.
   - A dummy variable for elected subnational authorities: Elected subnational authorities may have less fiscal discipline because of short-term electoral objectives requiring increases in spending.
   - The index of ethnolinguistic fractionalization (showing the probability that two randomly selected individuals belong to different ethnolinguistic groups): In more fractionalized countries, the autonomy and bargaining power of ethnic regions may be higher, undermining the central government's ability to impose fiscal discipline throughout the country.
6. *Demographic variables:*
   - Population density: Lower population density can put additional pressure on subnational governments because the provision of public goods is, on average, more costly than in densely populated areas.

- Dependency ratio (the share of population below the age of 15 or above the age of 64): A higher dependency ratio also could put additional fiscal pressure on subnational governments, because the young and the elderly consume a disproportionately large share of public goods and services and receive a larger share of social transfers.

7. *Development variables:* GDP per capita and a dummy distinguishing emerging markets from industrial economies take into account the better fiscal positions and institutions of developed countries.
8. *Size variables:*
   - Size of general government: The ratio of government expenditure to GDP may influence fiscal balances, because larger governments may find it harder to balance their budgets.
   - Area: Rodden (2002) reported that larger countries (in terms of area) run higher fiscal surpluses, on average.
9. *Federal structure:*
   - A federation dummy, because a federal structure may increase the bargaining power of the regions, undermining fiscal discipline.
   - The average size of subnational jurisdictions (measured by the average subnational government expenditure-to-GDP ratio), because large jurisdictions may find it easier to borrow and are more likely to undertake large-scale investment projects requiring outside sources of financing.
   - Horizontal imbalances (interregional disparities in per capita income and budget expenditure) calling for equalization programs that result in a higher reliance on federal transfers.[7]

General Approach

This section examines the long-term effects of controlling subnational borrowing. Subnational borrowing controls aim at addressing the problem of subnational fiscal indiscipline. Because these problems are deeper when vertical fiscal imbalances are larger (as discussed in Section I), the marginal effect of subnational borrowing controls is expected to be larger under high vertical fiscal imbalances.[8] To capture this possibility, we assume such marginal effects depend on the degree of vertical fiscal imbalance according to the following linear parametric form:

$$\alpha_{ij} = \alpha_{0j} + \alpha_{1j} * vfi_i, \tag{1}$$

where vfi_i is the vertical fiscal imbalance in country i and α_{0j} is the component of the marginal effect of approach j (for example, cooperative arrangements) that does not depend on the vertical fiscal imbalance.

[7]Because of data constraints, the impact of horizontal imbalances on fiscal outcomes could not be estimated.

[8]To give an example, suppose that a certain rule can achieve a balanced budget for subnational government. Then its marginal effect on subnational fiscal balance will equal 10 percent if the average deficit had previously been 10 percent, and only 2 percent if the initial deficit averaged 2 percent.

The basic linear specification for subnational fiscal balances, as shown in equation (2), is similar to that used by Rodden (2002). In addition, it includes a dummy variable for bailout history (*bailout*), dummy variables for each subnational borrowing regime, and interaction terms for the degree of vertical fiscal imbalance (vfi_{it}) and each regime dummy. The sets of regime dummies and interaction terms together capture the marginal effects as modeled in equation (1):

$$\begin{aligned} SS_{it} = {} & \beta_0 + \alpha_{01} self_i + \alpha_{02} coop_i + \alpha_{03} central_i + \alpha_{04} admin_i + \beta_1 vfi_{it} \\ & + \alpha_{11} self_i * vfi_{it} + \alpha_{12} coop_i * vfi_{it} + \alpha_{13} central_i * vfi_{it} + \alpha_{14} admin_i * vfi_{it} \\ & + \beta_2 CS_{it} + \gamma bailout_i + \delta controls_{it} + \varepsilon_{it}, \end{aligned} \tag{2}$$

where countries are indexed by *i* and years by *t; SS* is the subnational government fiscal balance measured as the ratio of budget surplus to total revenue; *self, coop, central,* and *admin* are dummy variables for self-imposed rules, cooperative arrangements, centrally imposed rules, and administrative controls, respectively; *controls* are the vector of control variables; and ε_{it} is the error term. The group of countries with no rules is chosen as a reference group for comparison.

Following Rodden (2002), the central government fiscal balance (measured as the ratio of central government surplus to total central government revenue and denoted as *CS*) is also included for several reasons. First, the average fiscal balance of the central government is a proxy for a society's general preference for sustainable fiscal policy. Second, for countries where subnational government data are available only for a few years, the average fiscal balance of the central government captures possible business cycle effects. Third, the variable partly absorbs the effects of severe financial crises that affect average fiscal performance.

Because the focus of the long-term analysis is on *average* subnational outcomes, equation (2) was estimated using the "between" panel estimator that exploits cross-sectional differences between the time averages of variables for every country.

Results

The results appear in column 1 of Table 2. Consistent with our prior expectations, the presence of a bailout history is associated with a statistically significant weaker subnational fiscal performance (3.7 percentage points higher subnational budget deficits[9]). Subnational governments also tend to be more disciplined in countries with more disciplined central governments; however, the level of decentralization as such does not seem to have any significant long-term effect on subnational government discipline.[10]

Concerning subnational borrowing constraints, self-imposed fiscal rules seem to perform better than centrally imposed rules, but only with low vertical fiscal

[9]All marginal effects are measured in percentage points of total subnational government revenue.

[10]To preserve degrees of freedom and to avoid possible multicollinearity, additional controls were omitted unless statistically significant. Appendix Table A.2 summarizes the evidence on the impact of additional controls.

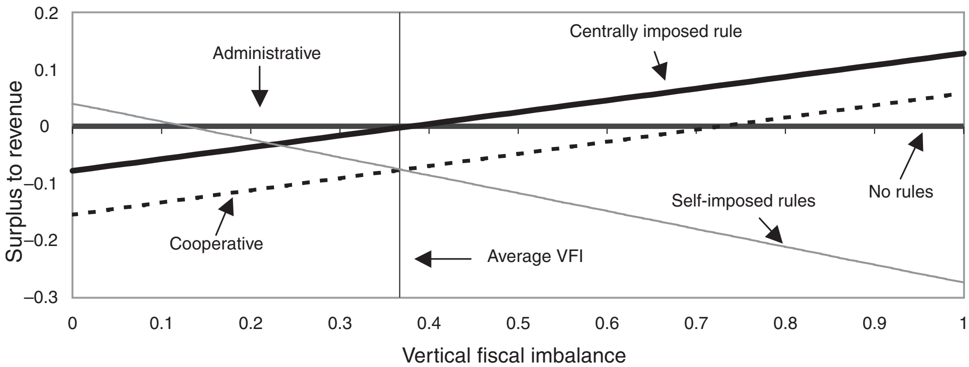
Table 2. Determinants of Subnational Fiscal Balances

Model (Equation 2)	1 Linear	2 IV	3 Common Standards	4 Emerging Countries
Method	Between	Two-stage	Between	
Dependent variable	Subnational surplus to revenue			
Central government surplus (*CS*)	0.478	0.619	0.497	0.482
	(0.102)***	(0.351)*	(0.127)***	(0.095)***
Decentralization (*dec*)	–0.003	0.093	0.024	0.025
	(0.078)	(0.402)	(0.098)	(0.073)
Self-imposed rule (*self*)	0.040			0.063
	(0.145)			(0.136)
Centrally imposed rule (*central*)	–0.078	–0.026	–0.079	–0.109
	(0.045)*	(0.438)	(0.049)	(0.043)**
Cooperative (*coop*)	–0.155	0.214	–0.163	–0.162
	(0.064)**	(0.312)	(0.059)**	(0.060)***
Administrative (*admin*)	0.003	0.220	–0.025	0.013
	(0.042)	(0.311)	(0.050)	(0.039)
*VFI * self*	–0.314			–0.439
	(0.614)			(0.575)
*VFI * central*	0.206	0.467	0.188	0.197
	(0.098)**	(0.492)	(0.099)*	(0.092)**
*VFI * coop*	0.213	–0.412	–0.012	0.221
	(0.108)*	(0.684)	(0.150)	(0.101)**
*VFI * admin*	0.0003	–0.006	0.050	0.001
	(0.073)	(0.165)	(0.087)	(0.068)
Common standards of PEM			0.179	
* *coop*			(0.071)**	
Common standards of PEM			0.024	
* *central*			(0.047)	
*VFI * central * emerge*				0.213
				(0.085)**
GDP (log, in US$, PPP terms)	0.030	0.045	0.018	0.036
	(0.017)*	(0.046)	(0.023)	(0.016)**
Size of government	–0.187	–0.14		–0.158
	(0.130)	(0.144)		(0.122)
Bailout history (*bailout*)	–0.037	–0.023	–0.017	–0.043
	(0.020)*	(0.021)	(0.021)	(0.018)**
Constant	–0.166	–0.455	–0.092	–0.234
	(0.133)	(0.559)	(0.200)	(0.127)
Number of observations	572	523	425	572
Number of groups	50	47	35	52
R^2 (between)	0.63	0.57	0.8	0.69

Source: Authors' calculations.

Notes: Robust standard errors in parentheses. Values significant at the 10 percent level are marked with *; at the 5 percent level, with **; at the 1 percent level, with ***. VFI is vertical fiscal imbalance; PEM is public expenditure management; PPP is purchasing power parity; *Emerge* is emerging market dummy. The first-stage results of the two-stage IV procedure are presented in Appendix Table A.3.

Figure 1. Marginal Effect of Different Subnational Borrowing Controls on Average Subnational Fiscal Balance



Source: Authors' calculations.

imbalances.[11] The marginal effect of rules imposed on subnational borrowing by the central government and the effect of cooperative arrangements tend to increase rapidly as vertical fiscal imbalances widen (because the positive coefficients on the interaction terms are relatively large and statistically significant). The coefficient on the interaction term for the administrative approach is also positive, but relatively small and statistically insignificant, reflecting the possibility that administrative rules fail to solve the problem of soft budget constraints in the long run.

Figure 1 plots the marginal effects of the different borrowing regimes on subnational fiscal outcomes for different levels of vertical fiscal imbalance.[12] The fact that centrally imposed rules and cooperative arrangements appear to be harmful when vertical fiscal imbalances are at zero should not be misinterpreted: zero vertical fiscal imbalances simply do not exist. The area where self-imposed rules appear to be optimal (at vertical fiscal imbalances below 11 percent) includes only 3 countries, but the area where centrally imposed fiscal rules perform best of all (at vertical fiscal imbalances above 40 percent) covers 22 countries. Administrative controls seem to be superior between these two thresholds, whereas cooperative arrangements and unrestricted borrowing never outperform these alternative institutional frameworks.[13]

[11]However, the standard error of the corresponding coefficient is high because only three countries in the sample are characterized by self-imposed rules.

[12]The vertical axis crosses the horizontal one at the mean level of vertical fiscal imbalance. The horizontal axis corresponds to the case of unrestricted subnational borrowing.

[13]All these conclusions should be viewed as tentative, because standard errors of the marginal effects of subnational borrowing controls are large, with confidence areas of the lines shown in Figure 1 overlapping in most cases. For instance, the positive marginal effect of centrally imposed rules is statistically significant at the 10 percent level only if vertical fiscal imbalance exceeds 70 percent. The 95 percent confidence interval for the marginal effect of centrally imposed rules at the 50 percent level of vertical fiscal imbalance is [–0.028; 0.078]. To avoid overloading Figure 1 with details, confidence intervals are not shown.

To examine the impact of common financial reporting and budgeting standards on the effectiveness of subnational borrowing controls, equation (2) was augmented with interaction terms between the dummy for common standards of public expenditure management and dummies for the different subnational borrowing regimes.[14] The results reported in column 3 of Table 2 show that the success of cooperative arrangements depends on the presence of common standards in financial reporting. (The positive coefficient on the interaction term is large and statistically significant.)

Soft budget constraints and common pool problems affect local finances in all countries. However, in emerging economies that tend to have weaker institutions, fiscal discipline at the subnational level may also be weaker. At first glance, the average subnational fiscal balance in the subsample of industrial countries is –2.3 percent, compared with –4.2 percent in the subsample of emerging economies. Therefore, given this initial difference in fiscal problems, the marginal effect of introducing restrictions on subnational borrowing could be high in emerging economies, especially in those with high vertical fiscal imbalances.

Testing this hypothesis is difficult, however, because emerging economies more often adopt administrative rules, whereas industrial countries almost exclusively utilize cooperative arrangements. Thus, a differential effect of subnational borrowing constraints in emerging and industrial countries can be tested only for centrally imposed fiscal rules (adopted by six emerging economies and six industrial countries in the sample). A positive and statistically significant coefficient on the interaction term *vfi*central*emerge* added to equation (2) would provide evidence in support of the hypothesis (*emerge* being the emerging country dummy).

The results appear in column 4 of Table 2. Figure 2 plots the marginal effects of centrally imposed rules in industrial countries and emerging economies against the degree of vertical fiscal imbalances. The results show that in emerging economies, there is an even stronger case for adopting centrally imposed fiscal rules because they start outperforming other approaches at substantially lower levels of vertical fiscal imbalance, and their marginal effect grows faster as vertical fiscal imbalances widen.[15]

Finally, because the construction of the bailout history dummy in many cases relies on subjective individual opinions about the purpose of intergovernmental transfers and the ways in which they are allocated, we estimated equation (1) omitting the bailout history variable (*bailout*). The results presented in Appendix Table A.4 are qualitatively similar to those reported in Table 2.

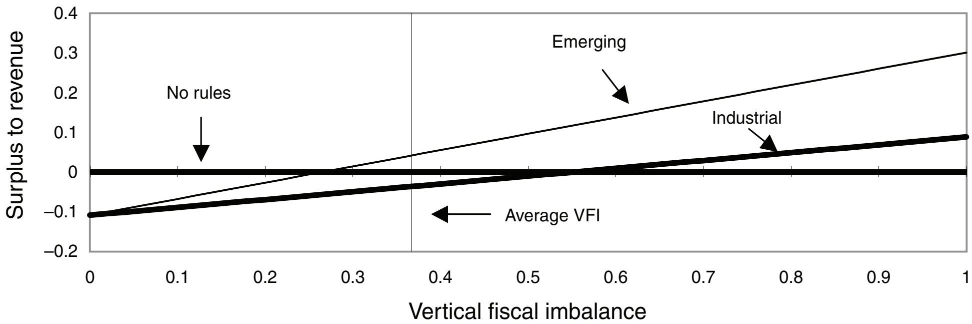
Potential Endogeneity of Subnational Borrowing Controls

The between estimates presented in Figure 1 could be biased if subnational borrowing controls were not strictly exogenous. Although subnational borrowing regimes influence average subnational fiscal outcomes, the latter could, in turn, affect the choice of subnational borrowing regimes. Countries with less disciplined subnational governments may have to adopt stricter rules, whereas countries with more

[14]Lack of sufficient observations did not allow inclusion of self-imposed fiscal rules in this analysis.

[15]The positive marginal effect of centrally imposed fiscal rules in emerging economies is statistically significant at the 5 percent level whenever vertical fiscal imbalance exceeds 43 percent.

Figure 2. Marginal Effect of Centrally Imposed Rules on Average Subnational Fiscal Balance in Industrial and Emerging Countries



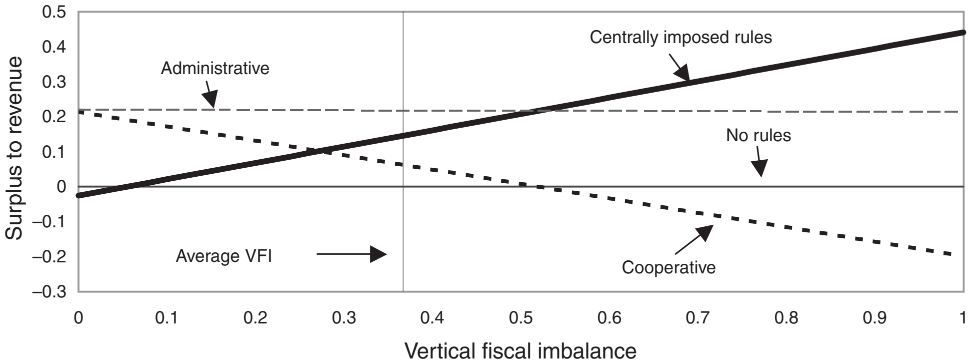
Source: Authors' calculations.

disciplined subnational governments could rely on market discipline. The fact that most countries chose subnational borrowing controls before the period under consideration, and hence the average subnational fiscal balances could not directly affect the choice, partly alleviates the potential endogeneity problem that arises. However, concerns still exist insofar as current average subnational fiscal balances tend to correlate with past averages.

A consistent two-stage estimator similar to the two-stage least squares addresses the problem of endogeneity. Because the potentially endogenous regressors are a set of mutually exclusive dummies, the first stage is modified to incorporate a multinomial logit model instead of the usual linear regression. The small sample size limited the first-stage regression to be parsimonious, because inclusion of each explanatory variable, including a constant, requires four degrees of freedom. The preferred specification included the degree of fiscal decentralization, GDP, the average fiscal balance of the central government, and a constant. This combination of variables has the highest explanatory power for the choice of subnational borrowing regimes, and they can be assumed to be exogenous. In particular, it is assumed that fiscal performance at the subnational level does not directly affect GDP, average central government fiscal balance, or the extent to which the government is decentralized. The results of the first-stage estimation are summarized in Appendix Table A.3. The probabilities of adopting each approach estimated in the first stage are then used instead of their respective dummy variables in the second stage to estimate equation (2).

The results of the second-stage estimation reported in column 2 of Table 2 show that the main qualitative findings hold. Figure 3, based on the two-stage estimates, looks very similar to Figure 1. However, there are two obvious distinctions. First, the horizontal axis has "plunged," implying that unrestricted subnational borrowing is associated now with inferior subnational fiscal outcomes, relative to any other approach (except cooperative when vertical fiscal imbalance is high). Second, the positive marginal impact of cooperative arrangements decreases when vertical fiscal imbalances widen. Both observations imply that countries that do not impose limits

Figure 3. Marginal Effect of Different Subnational Borrowing Controls on Average Subnational Fiscal Balance (IV Estimates)



Source: Authors' calculations.

on subnational borrowing or that opt for a cooperative approach have intrinsically more disciplined subnational governments, whereas countries with intrinsically less disciplined subnational governments opt for fiscal rules or administrative controls.[16]

III. Conclusions and Recommendations

Assessing the impact of an institutional framework on fiscal outcomes is a challenging task. The institutional framework governing intergovernmental fiscal relations is complex, and classifying countries often requires a judgment call. Some countries may be using several institutional features simultaneously; others may opt for different institutional mechanisms over time. In addition, other institutional characteristics that also affect fiscal policy may accompany the adoption of a specific fiscal framework, and disentangling these effects is difficult. The use of a broad range of controls (see Appendix Tables A.2 and A.4) and instrumental variables alleviates self-selection and endogeneity problems, but does not remove them entirely. Methods of controlling for self-selection, either semiparametric (propensity score–based) or parametric (Heckman's estimator), are unfortunately very demanding in terms of degrees of freedom, particularly in the presence of endogenous variables, and could not be performed on the available sample. Nevertheless, the empirical results presented in this paper suggest some broad conclusions:

- No single institutional arrangement seems to be superior to all the others under all circumstances. The appropriateness of any given borrowing constraint requires assessment in light of other institutional characteristics, particularly the degree of vertical fiscal imbalances, the existence of any bailout precedents, and the quality of fiscal reporting.

[16]As can be seen from Table 2, the statistical significance of the IV estimates is low. Consequently, all confidence areas corresponding to the lines of Figure 3 overlap. Countries with self-imposed rules were removed from the sample owing to an insufficient number of observations.

- Giving unconstrained borrowing authority to subnational governments is unlikely to be an optimal solution. At low levels of vertical fiscal imbalances, fiscal rules adopted by subnational governments themselves seem to lead to better fiscal outcomes.
- As vertical fiscal imbalances widen, however, the positive effect of self-imposed rules declines rapidly, and centrally imposed fiscal rules seem to become the best option, especially in emerging economies.
- For high vertical imbalances, although administrative procedures may provide the central government with even tighter control over subnational government fiscal outcomes (compared with both fiscal rules and cooperative arrangements), the implicit guarantee of subnational debt related to these controls seems to undermine fiscal discipline in the long run.
- The adoption of common standards of financial reporting is crucial for the success of cooperative arrangements and may increase the effectiveness of centrally imposed fiscal rules.

Fiscal rules may take a wide variety of forms, however. As already discussed, some rules establish a debt ceiling or target fiscal deficit, and others cap expenditure. Coverage differs also. In addition, borrowing constraints may be enforced in different ways. In some countries, it is left to financial markets to sanction fiscally undisciplined local governments. Other countries support a more cooperative approach, whereby subnational governments agree to impose administrative as well as financial sanctions and penalties among themselves. Higher levels of government can also retain the right to punish subnational governments for noncompliance. Some countries have even adopted bankruptcy procedures for subnational governments in case of a crisis, in order to avoid bailouts and achieve a more transparent resolution process. Finally, transfer systems may take various forms, and a given level of vertical fiscal imbalance might capture different incentives. Constrained by data availability, this paper could not deal with the interactions of these important institutional features and leaves this to future research.

APPENDIX: DATA SOURCES

The data set was compiled using the following sources:

Data on central and subnational government budgets: IMF, *Government Finance Statistics* (2002).

Macroeconomic indicators: World Bank, *World Development Indicators* (2004).

Subnational jurisdictions structure: World Bank (2000), Table A.1.

Corruption perception indices: Transparency International.

Political indicators, election years: World Bank Database of Political Indicators (2000).

Federal/unitary country: Classification developed by Treisman (2002).

Index of horizontal imbalances: Data from Rodden and Wibbels (2002), Table 2.

Data on the standards of budgeting and financial reporting: OECD (2003).

Central bank independence index: Cukierman (1992).

Ethnolinguistic fractionalization: Roeder (2001). The index measures the probability that two randomly selected individuals belong to different ethnolinguistic groups.

Data on Russia: Statistical Yearbook of Russia (2003), Goskomstat, Moscow (*Rossiyskiy Statisticheskiy Ezhegodnik 2003*).

Data on India: Purfield (2004).

Table A.1. Subnational Borrowing Controls Across the World

Country	Regime	Bailout History	Years	Sources
Argentina	Self-imposed rules	Yes	1993–2000	Webb (2003); Braun and Tommasi (2004); Schwartz and Liuksila (1997); Rezk (1998); IDB (1997)
Australia	Cooperative	Yes	1982–2000	Robinson (2001); Craig (1997); von Hagen and others (2000)
Austria 1	Central rule	No	1982–98	
Austria 2	Cooperative	No	1999–2000	Thöni, Garbislander, and Haas (2002)
Belgium	Cooperative	No	1982–98	Bogaert and Père (2001); Vanneste (2002)
Bolivia	Administrative	No	1986–2000	MacKenzie and Ruiz (1997); IDB (1997)
Brazil 1	Administrative	Yes	1989–94	
Brazil 2	Central rule	Yes	1997–98	Rodden (2003a); Ter-Minassian (1997a); IDB (1997)
Canada (local)	Central rule	No	1985–2000	
Canada (provinces)	Unrestricted	Yes	1982–2000	Bird and Tassonyi (2003); Krelove, Stotsky, and Vehorn (1997)
Chile	Administrative	Yes	1983–2000	IDB (1997), UNCTAD (2002)
Colombia	Central rule	Yes	1982–86	Ahmad and Baer (1997); Bird and Fiszbein (1998); IDB (1997); UNCTAD (2002)
Croatia	Unrestricted	No	1994–2000	Dabla-Norris and Wade (2002)
Czech Republic	Unrestricted	No	1993–2000	Dabla-Norris and Wade (2002); OECD (2000)
Denmark	Cooperative	No	1982–2000	Jørgen and Pedersen (2002)
Estonia	Central rule	No	1991–2000	Dabla-Norris and Wade (2002); OECD (2000)
Finland	Unrestricted	No	1982–98	Ter-Minassian and Craig (1997); OECD (2003)
France	Unrestricted	Yes	1982–87	Gilbert and Guengant (2002); UNCTAD (2002)
Germany 1	Central rule	Yes	1982–91	Wurzel (1999); Wendorff (2001); Rodden (2003b); von Hagen and others (2000)
Germany 2	Cooperative	Yes	1992–98	
Guatemala	Administrative	No	1990–93	IDB (1997)
Hungary 1	Unrestricted	Yes	1982–95	
Hungary 2	Central rule	Yes	1996–2000	Wetzel and Papp (2003); Lutz and others (1997); OECD (2000)
Iceland	Unrestricted	No	1983–98	OECD (2003)
India 1	Administrative	Yes	1982–98	
India 2	Cooperative	Yes	1999–2000	McCarten (2003); Purfield (2004)
Indonesia	Administrative	Yes	1982–93	Shah (1998); Lewis (2003)
Ireland	Administrative	Yes	1989–97	Ter-Minassian and Craig (1997); OECD (2003)
Israel	Administrative	No	1988–2000	Hecht (1988)

(*continued*)

Table A.1 (*concluded*)

Country	Regime	Bailout History	Years	Sources
Italy	Central rule	Yes	1985–99	Fraschini (2002); von Hagen and others (2000)
Latvia	Administrative	Yes	1994–2000	Dabla-Norris and Wade (2002); OECD (2000)
Lithuania	Central rule	No	1993–2000	Dabla-Norris and Wade (2002); OECD (2000)
Mexico	Administrative	Yes	1982–2000	Amieva-Huerta (1997); IDB (1997)
Netherlands	Unrestricted	Yes	1982–97	Ter-Minassian and Craig (1997); OECD (2003)
New Zealand	Unrestricted	No	1992–2000	OECD (2003)
Nigeria	Unrestricted	No	1995–2000	Mered (1997)
Norway	Central rule	No	1982–99	Borge and Rattsø (2002); Rattsø (2003)
Peru	Administrative	No	1991–2000	IDB (1997)
Philippines	Administrative	No	1982–91	Petersen (2001)
Portugal	Unrestricted	No	1987–98	Ter-Minassian and Craig (1997); OECD (2003)
Russia	Unrestricted	Yes	1995–2000	Craig, Norregaard, and Tsibouris (1997); Dabla-Norris and Wade (2002)
Slovak Republic	Central rule	No	1996–2000	OECD (2003)
South Africa	Cooperative	No	1982–2000	Ahmad (2003); Ahmad (1998)
Spain 1	Central rule	Yes	1982–91	Gordo and de Cos (2001); Monasterio-Escudero and Suárez-Pandiello (2002)
Spain 2	Cooperative	Yes	1992–97	
Sweden	Unrestricted	Yes	1982–99	Pettersson-Lidbom and Dahlberg (2003); von Hagen and others (2000)
Switzerland	Self-imposed rules	No	1982–2000	Dafflon (2002); Spahn (1997)
United Kingdom	Administrative	No	1982–98	Watt (2002); Potter (1997)
United States	Self-imposed rules	No	1982–2000	Inman (2003); Stotsky and Sunley (1997)
Zimbabwe	Administrative	No	1982–91	Helmsing and others (1991)

Note: Data missing for Brazil 1995–96.

Table A.2. Statistically Insignificant Control Variables: Impact on Subnational Fiscal Balance

Variable	Sign[1]	Consistent with Prior Expectations?
Federation	+	No
Region-based representation in senate	–	Yes
Perceived corruption	–	Yes
Inflation	–	Yes
Real interest rates	+	Yes
Debt service to gross national income	+	Yes
Unemployment	–	Yes
Political cohesion index	+	Yes
Central bank independence	+	Yes
Elected subnational authorities	+	Yes
Proportion of young and elderly	+	No
Population density	–	No
Horizontal fiscal imbalances	+	No
Area, log	–	n.a.[2]
Emerging country	–	Yes
Size of jurisdictions (GDP share)	–	Yes
Ethnolinguistic fractionalization	–	Yes
Parliamentary republic	–	Yes

Source: Authors' calculations.
[1]+ (–) denotes a positive (negative) but insignificant coefficient.
[2]There is no prior hypothesis about the effect of area.

Table A.3. Determinants of Subnational Borrowing Regimes

	1	2	3
Regime	Cooperative	Centrally Imposed Rules	Administrative
Method		Multinomial logit	
Dependent variable		Subnational borrowing regime	
GDP (log, in US$, PPP terms)	1.007	0.605	–0.985
	(0.939)	(0.684)	(0.645)
Central government surplus to revenue (*CS*)	–8.628	–1.265	–8.108
	(5.756)	(3.725)*	(4.478)*
Decentralization (*dec*)	2.961	–8.619	–8.573
	(4.587)	(4.834)*	(4.664)*
Constant	–12.015	–6.299	10.029
	(8.597)	(6.639)	(5.824)*
Number of groups		47	
Pseudo R^2		0.17	

Source: Authors' calculations.
Notes: Robust standard errors in parentheses. Values significant at the 10 percent level are marked with *; at the 5 percent level, with **; at the 1 percent level, with ***.
This table reports the results of the first stage of a two-stage estimation procedure.
The second stage results are reported in Table 2 (column 2).

Table A.4. Determinants of Subnational Fiscal Balances: Additional Specifications

Model (Equation 2)	1 Linear	2 IV	3 Common Standards	4 Emerging Countries
Method	Between	Two-stage	Between	
Dependent variable	Subnational surplus to revenue			
Central government surplus (*CS*)	0.430	0.625	0.466	0.442
	(0.062)***	(0.352)*	(0.122)***	(0.095)***
Decentralization (*dec*)	–0.062	0.078	–0.004	–0.040
	(0.075)	(0.402)	(0.092)	(0.072)
Self-imposed rule (*self*)	0.049			0.054
	(0.138)			(0.132)
Centrally imposed rule (*central*)	–0.055	0.010	–0.070	–0.078
	(0.043)	(0.438)	(0.044)	(0.042)*
Cooperative (*coop*)	–0.154	0.159	–0.158	–0.161
	(0.064)**	(0.308)	(0.056)***	(0.061)**
Administrative (*admin*)	–0.006	0.229	–0.025	0.002
	(0.042)	(0.312)	(0.047)	(0.040)
*VFI * self*	–0.160			–0.216
	(0.597)			(0.570)
*VFI * central*	0.165	–0.226	0.189	0.146
	(0.093)*	(0.663)	(0.089)**	(0.089)
*VFI * coop*	0.238	0.328	0.009	0.247
	(0.107)**	(0.476)	(0.140)	(0.103)**
*VFI * admin*	0.037	0.112	0.047	0.037
	(0.072)	(0.165)	(0.083)	(0.068)
Common standards of PEM			0.171	
* *coop*			(0.065)**	
Common standards of PEM			0.013	
* *central*			(0.044)	
*VFI * central * emerge*				0.188
				(0.086)**
GDP (log, in US$, PPP terms)	0.012	0.048	0.003	0.019
	(0.013)	(0.046)	(0.018)	(0.012)
Constant	–0.082	–0.497	–0.013	–0.153
	(0.121)	(0.559)	(0.179)	(0.120)
Number of observations	572	523	425	572
Number of groups	50	47	35	50
R^2 (between)	0.55	0.56	0.78	0.61

Source: Authors' calculations.

Notes: Robust standard errors in parentheses. Values significant at the 10 percent level are marked with *; at the 5 percent level, with **; at the 1 percent level, with ***. VFI is vertical fiscal imbalance; PEM is public expenditure management; PPP is purchasing power parity; *Emerge* is emerging market dummy. These specifications are identical to those reported in Table 2, except bailout history dummy is excluded.

REFERENCES

Ahmad, Ehtisham, and Katherine Baer, 1997, "Colombia," in *Fiscal Federalism in Theory and Practice,* ed. by Teresa Ter-Minassian (Washington: International Monetary Fund), pp. 457–503.

Ahmad, Ehtisham, Raju J. Singh, and Mario Fortuna, 2004, "Toward More Effective Redistribution: Reform Options for Intergovernmental Transfers in China," IMF Working Paper 04/98 (Washington: International Monetary Fund).

Ahmad, Junaid, 1998, "South Africa: An Intergovernmental Fiscal System in Transition," in *Fiscal Decentralization in Developing Countries,* ed. by Richard M. Bird and François Vaillancourt (New York: Cambridge University Press), pp. 239–70.

———, 2003, "Creating Incentives for Fiscal Discipline in the New South Africa," in *Fiscal Decentralization and the Challenge of Hard Budget Constraints,* ed. by Jonathan Rodden, Gunnar S. Eskeland, and Jennie Litvack (Cambridge, Massachusetts: MIT Press), pp. 325–52.

Alesina, Alberto, and Roberto Perotti, 1995, "The Political Economy of Budget Deficits," *Staff Papers,* International Monetary Fund, Vol. 42 (March), pp. 1–31.

Amieva-Huerta, Juan, 1997, "Mexico," in *Fiscal Federalism in Theory and Practice,* ed. by Teresa Ter-Minassian (Washington: International Monetary Fund), pp. 570–97.

Besley, Timothy, and Anne Case, 1995, "Does Electoral Accountability Affect Economic Policy Choices? Evidence from Gubernatorial Term Limits," *Quarterly Journal of Economics,* Vol. 110 (August), pp. 769–98.

Bird, Richard M., and Ariel Fiszbein, 1998, "Colombia: The Central Role of the Central Government in Fiscal Decentralization," in *Fiscal Decentralization in Developing Countries,* ed. by Richard M. Bird and and François Vaillancourt (New York: Cambridge University Press), pp. 172–205.

Bird, Richard M., and Almos Tassonyi, 2003, "Constraining Subnational Fiscal Behavior in Canada: Different Approaches, Similar Results?" in *Fiscal Decentralization and the Challenge of Hard Budget Constraints,* ed. by Jonathan Rodden, Gunnar S. Eskeland, and Jennie Litvack (Cambridge, Massachusetts: MIT Press), pp. 85–132.

Bird, Richard M., and François Vaillancourt, eds., 1998, *Fiscal Decentralization in Developing Countries* (New York: Cambridge University Press).

Bogaert, Henri, and Thérèse Père, 2001, "Consolidation of Public Finances in Belgium: An Example of Application of European Norms in a State with a Federal Structure," in *Fiscal Rules* (Rome: Banca d'Italia), pp. 769–802.

Bordignon, Massimo, Paolo Manasse, and Guido Tabellini, 2001, "Optimal Regional Redistribution Under Asymmetric Information," *American Economic Review,* Vol. 91 (June), pp. 709–23.

Borge, Lars-Erik, and Jørn Rattsø, 2002, "Local Government Budgeting and Borrowing: Norway," in *Local Public Finance in Europe: Balancing the Budget and Controlling Debt,* ed. by Bernard Dafflon (Northampton, Massachusetts: Edward Elgar), pp. 191–208.

Braun, Miguel, and Mariano Tommasi, 2004, "Fiscal Rules for Subnational Governments: Some Organizing Principles and Latin American Experiences" (unpublished; Buenos Aires: Universidad de San Andrés Buenos Aires).

Cai, Hongbin, and Daniel Treisman, 2004, "State Corroding Federalism," *Journal of Public Economics,* Vol. 88 (March), pp. 819–43.

Craig, Jon, 1997, "Australia," in *Fiscal Federalism in Theory and Practice,* ed. by Teresa Ter-Minassian (Washington: International Monetary Fund).

———, John Norregaard, and George Tsibouris, 1997, "Russian Federation," in *Fiscal Federalism in Theory and Practice,* ed. by Teresa Ter-Minassian (Washington: International Monetary Fund), pp. 680–701.

Cukierman, Alex, 1992, *Central Bank Strategy, Credibility, and Independence: Theory and Evidence* (Cambridge, Massachusetts: MIT Press).

Dabla-Norris, Era, and Paul R. Wade, 2002, "The Challenge of Fiscal Decentralization in Transition Economies," IMF Working Paper 02/103 (Washington: International Monetary Fund).

Dafflon, Bernard, ed., 2002, *Local Public Finance in Europe: Balancing the Budget and Controlling Debt* (Northampton, Massachusetts: Edward Elgar).

Fornasari, Francesca, Steven B. Webb, and Heng-Fu Zou, 2000, "The Macroeconomic Impact of Decentralized Spending and Deficits: International Evidence," *Annals of Economics and Finance,* Vol. 1 (November), pp. 403–33.

Fraschini, Angela, 2002, "Local Borrowing: The Italian Case," in *Local Public Finance in Europe: Balancing the Budget and Controlling Debt,* ed. by Bernard Dafflon (Northampton, Massachusetts: Edward Elgar), pp. 165–89.

Gilbert, Guy, and Alain Guengant, 2002, "The Public Debt of Local Governments in France," in *Local Public Finance in Europe: Balancing the Budget and Controlling Debt,* ed. by Bernard Dafflon (Northampton, Massachusetts: Edward Elgar), pp. 115–33.

Gordo, Luis, and Pablo H. de Cos, 2001, "The Financing Arrangements for the Regional (Autonomous) Governments for the Period 1997–2001," in *Fiscal Rules* (Rome: Banca d'Italia), pp. 637–76.

Granof, Michael H., 1984, "A Fundamental Flaw of Debt Limitations for State and Local Governments," *Journal of Accounting and Public Policy,* Vol. 3 (Winter), pp. 293–310.

Hecht, Arye, 1988, "The Financing of Local Authorities," in *Local Government in Israel,* ed. by Daniel Elazar and Chaim Kalchheim (Lanham, Maryland: University Press of America).

Helmsing, A.H.J. and others, 1991, "Rural Local Government Finance. Past Trends and Future Options," in *Limits to Decentralization in Zimbabwe: Essays on the Decentralization of Government and Planning in the 1980s,* ed. by A.H.J. Helmsing and others (The Hague: Institute of Social Studies Press).

Inman, Robert P., 2003, "Transfers and Bailouts: Enforcing Local Fiscal Discipline with Lessons from U.S. Federalism," *Fiscal Decentralization and the Challenge of Hard Budget Constraints,* ed. by Jonathan Rodden, Gunnar S. Eskeland, and Jennie Litvack (Cambridge, Massachusetts: MIT Press), pp. 35–84.

Inter-American Development Bank (IDB), 1997, *Latin America After a Decade of Reforms,* Economic and Social Progress in Latin America, 1997 Report (Washington).

Jin, Jing, and Heng-Fu Zou, 2002, "How Does Fiscal Decentralization Affect Aggregate, National, and Subnational Government Size?" *Journal of Urban Economics,* Vol. 52 (September), pp. 270–93.

Jørgen, Niels, and Mau Pedersen, 2002, "Local Government and Debt Financing in Denmark," in *Local Public Finance in Europe: Balancing the Budget and Controlling Debt,* ed. by Bernard Dafflon (Northampton, Massachusetts: Edward Elgar), pp. 93–114.

Keen, Michael J., 1998, "Vertical Tax Externalities in the Theory of Fiscal Federalism," *IMF Staff Papers,* Vol. 45 (September), pp. 454–85.

———, and Christos Kotsogiannis, 2002, "Does Federalism Lead to Excessively High Taxes?" *American Economic Review,* Vol. 92 (March), pp. 363–70.

Kornai, János, Eric Maskin, and Gérard Roland, 2003, "Understanding the Soft Budget Constraint," *Journal of Economic Literature,* Vol. 41 (December), pp. 1095–136.

Krelove, Russell, Janet G. Stotsky, and Charles L. Vehorn, 1997, “Canada,” in *Fiscal Federalism in Theory and Practice,* ed. by Teresa Ter-Minassian (Washington: International Monetary Fund), pp. 201–25.

Lane, Timothy D., 1993, “Market Discipline,” *Staff Papers,* International Monetary Fund, Vol. 40 (March), pp. 53–88.

Lewis, Blane D., 2003, “Local Government Borrowing and Repayment in Indonesia: Does Fiscal Capacity Matter?” *World Development,* Vol. 31 (June), pp. 1047–63.

Lutz, Mark, Edgardo Ruggiero, Paul B. Spahn, and Emil M. Sunley, 1997, “Hungary,” in *Fiscal Federalism in Theory and Practice,* ed. by Teresa Ter-Minassian (Washington: International Monetary Fund), pp. 660–79.

MacKenzie, George A., and José-Luís Ruiz, 1997, “Bolivia,” in *Fiscal Federalism in Theory and Practice,* ed. by Teresa Ter-Minassian (Washington: International Monetary Fund), pp. 423–37.

McCarten, William J., 2003, “The Challenge of Fiscal Discipline in the Indian States,” in *Fiscal Decentralization and the Challenge of Hard Budget Constraints,* ed. by Jonathan Rodden, Gunnar S. Eskeland, and Jennie Litvack (Cambridge, Massachusetts: MIT Press), pp. 249–86.

Mered, Michael, 1997, “Nigeria,” in *Fiscal Federalism in Theory and Practice,* ed. by Teresa Ter-Minassian (Washington: International Monetary Fund), pp. 570–97.

Monasterio-Escudero, Carlos, and Javier Suárez-Pandiello, 2002, “Local Government Financing and Borrowing: Spain,” in *Local Public Finance in Europe: Balancing the Budget and Controlling Debt,* ed. by Bernard Dafflon (Northampton, Massachusetts: Edward Elgar), pp. 231–55.

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

Organization for Economic Cooperation and Development (OECD), 1999, *Taxing Powers of State and Local Government,* OECD Tax Policy Studies, No. 1 (Paris: OECD).

———, 2000, *Fiscal Design Across Levels of Government Year 2000 Surveys: Report on Activities* (Paris: OECD).

———, 2003, *OECD/World Bank Budget Practices and Procedures Survey* (Paris).

Persson, Torsten, and Guido Tabellini, 1996, “Federal Fiscal Constitutions: Risk Sharing and Moral Hazard,” *Econometrica,* Vol. 64 (May), pp. 623–46.

———, 2003, *The Economic Effects of Constitutions* (Cambridge, Massachusetts: MIT Press).

Petersen, John E., 2001, “Subnational Debt, Borrowing Process, and Creditworthiness” (Washington: World Bank Institute).

Poterba, James M., and Jürgen von Hagen, eds., 1999, *Fiscal Institutions and Fiscal Performance,* National Bureau of Economic Research Conference Report (Chicago: University of Chicago Press).

Potter, Barry, 1997, “United Kingdom,” in *Fiscal Federalism in Theory and Practice,* ed. by Teresa Ter-Minassian (Washington: International Monetary Fund), pp. 342–58.

Purfield, Catriona, 2004, “The Decentralization Dilemma in India,” IMF Working Paper 04/32 (Washington: International Monetary Fund).

Rattsø, Jørn, 2002, “Fiscal Controls in Europe: A Summary,” in *Local Public Finance in Europe: Balancing the Budget and Controlling Debt,* ed. by Bernard Dafflon (Northampton, Massachusetts: Edward Elgar), pp. 277–90.

———, 2003, “Vertical Imbalance and Fiscal Behavior in a Welfare State: Norway,” in *Fiscal Decentralization and the Challenge of Hard Budget Constraints,* ed. by Jonathan Rodden, Gunnar S. Eskeland, and Jennie Litvack (Cambridge, Massachusetts: MIT Press), pp. 133–60.

Rezk, Ernesto, 1998, “Argentina: Fiscal Federalism and Decentralization,” in *Fiscal Decentralization in Developing Countries,* ed. by Richard M. Bird and and François Vaillancourt (New York: Cambridge University Press), pp. 206–38.

Robinson, Marc, 2001, “National and State Fiscal Rules in Australia: An Outline and Critical Analysis,” in *Fiscal Rules* (Rome: Banca d’Italia), pp. 713–36.

Rodden, Jonathan, 2002, “The Dilemma of Fiscal Federalism: Grants and Fiscal Performance Around the World,” *American Journal of Political Science,* Vol. 46, No. 3, pp. 670–87.

———, 2003a, “Federalism and Bailouts in Brazil,” in *Fiscal Decentralization and the Challenge of Hard Budget Constraints,* ed. by Jonathan Rodden, Gunnar S. Eskeland, and Jennie Litvack (Cambridge, Massachusetts: MIT Press), pp. 213–48.

———, 2003b, “Soft Budget Constraints and German Federalism,” in *Fiscal Decentralization and the Challenge of Hard Budget Constraints,* ed. by Jonathan Rodden, Gunnar S. Eskeland, and Jennie Litvack (Cambridge, Massachusetts: MIT Press), pp. 161–86.

———, and Gunnar S. Eskeland, 2003, “Lessons and Conclusions,” in *Fiscal Decentralization and the Challenge of Hard Budget Constraints,* ed. by Jonathan Rodden, Gunnar S. Eskeland, and Jennie Litvack (Cambridge, Massachusetts: MIT Press), pp. 431–66.

———, and Jennie Litvack, eds., 2003, *Fiscal Decentralization and the Challenge of Hard Budget Constraints* (Cambridge, Massachusetts: MIT Press).

———, and Erik Wibbels, 2002, “Beyond the Fiction of Federalism: Macroeconomic Management in Multitiered Systems,” *World Politics,* Vol. 54 (July), pp. 494–531.

Roeder, Philip G., 2001, “Ethnolinguistic Fractionalization (ELF) Indices, 1961 and 1985” (unpublished; San Diego: University of California). Available via the Internet: http://weber.ucsd.edu/~proeder/elf.htm

Schwartz, Gerd, and Claire Liuksila, 1997, “Argentina,” in *Fiscal Federalism in Theory and Practice,* ed. by Teresa Ter-Minassian (Washington: International Monetary Fund), pp. 387–422.

Shah, Anwar, 1998, “Indonesia and Pakistan: Fiscal Decentralization—An Elusive Goal?” in *Fiscal Decentralization in Developing Countries,* ed. by Richard M. Bird and and François Vaillancourt (New York: Cambridge University Press), pp. 115–51.

Spahn, Paul B., 1997, “Switzerland,” in *Fiscal Federalism in Theory and Practice,* ed. by Teresa Ter-Minassian (Washington: International Monetary Fund), pp. 324–41.

Stotsky, Janet G., and Emil M. Sunley, 1997, “United States,” in *Fiscal Federalism in Theory and Practice,* ed. by Teresa Ter-Minassian (Washington: International Monetary Fund), pp. 359–83.

Ter-Minassian, Teresa, ed., 1997a, “Brazil,” in *Fiscal Federalism in Theory and Practice,* ed. by Teresa Ter-Minassian (Washington: International Monetary Fund), pp. 438–56.

———, 1997b, *Fiscal Federalism in Theory and Practice* (Washington: International Monetary Fund).

———, and Jon Craig, 1997, “Control of Subnational Government Borrowing,” in *Fiscal Federalism in Theory and Practice,* ed. by Teresa Ter-Minassian (Washington: International Monetary Fund).

Ter-Minassian, Teresa, Maria Albino-War, and Raju Singh, 2004, “Managing Subnational Borrowing,” paper presented at the Authors’ Conference for the Handbook of Fiscal Federalism, Turin, August.

Thöni, Erich, Stefan Garbislander, and Dieter-Jorg Haas, 2002, “Local Budgeting and Local Borrowing in Austria,” in *Local Public Finance in Europe: Balancing the Budget and Controlling Debt,* ed. by Bernard Dafflon (Northampton, Massachusetts: Edward Elgar), pp. 45–73.

Treisman, Daniel, 2002, “Decentralization and the Quality of Government” (unpublished; Los Angeles: University of California).

United Nations Conference on Trade and Development (UNCTAD), 2002, *DMFAS INFO (Newsletter of the Programme on Debt Management and Financial Analysis System),* No. 14 (2nd Semester).

Vanneste, Jacques, 2002, "Local Public Finance in Belgium: Structure, Budgets and Debt," in *Local Public Finance in Europe: Balancing the Budget and Controlling Debt,* ed. by Bernard Dafflon (Northampton, Massachusetts: Edward Elgar), pp. 75–91.

von Hagen, Jürgen, and Barry Eichengreen, 1996, "Federalism, Fiscal Restraints, and European Monetary Union," *American Economic Review, Papers and Proceedings,* Vol. 86 (May), pp. 134–38.

von Hagen, Jürgen, and Ian J. Harden, 1994, "National Budget Processes and Fiscal Performance," in "Towards Greater Fiscal Discipline," *European Economy,* Reports and Studies No. 3 (Brussels: European Commission, Directorate-General for Economic and Financial Affairs), pp. 311–418.

von Hagen, Jürgen, and others, 2000, "Subnational Government Bailouts in OECD Countries: Four Case Studies," Research Network Working Paper R-399 (Washington: Inter-American Development Bank).

Watt, Peter A., 2002, "Local Government Capital Expenditure in England," in *Local Public Finance in Europe: Balancing the Budget and Controlling Debt,* ed. by Bernard Dafflon (Northampton, Massachusetts: Edward Elgar), pp. 257–75.

Webb, Stephen B., 2003, "Argentina: Hardening the Provincial Budget Constraint," in *Fiscal Decentralization and the Challenge of Hard Budget Constraints,* ed. by Jonathan Rodden, Gunnar S. Eskeland, and Jennie Litvack (Cambridge, Massachusetts: MIT Press), pp. 189–212.

Weingast, Barry R., Kenneth A. Shepsle, and Christopher Johnsen, 1981, "The Political Economy of Benefits and Costs: A Neoclassical Approach to Distributive Politics," *Journal of Political Economy,* Vol. 89 (August), pp. 642–64.

Wendorff, Karsten, 2001, "The Discussion on a National Stability Pact in Germany," in *Fiscal Rules* (Rome: Banca d'Italia), pp. 677–712.

Wetzel, Deborah, and Anita Papp, 2003, "Strengthening Hard Budget Constraints in Hungary," in *Fiscal Decentralization and the Challenge of Hard Budget Constraints,* ed. by Jonathan Rodden, Gunnar S. Eskeland, and Jennie Litvack (Cambridge, Massachusetts: MIT Press), pp. 393–428.

Wildasin, David E., 2004, "The Institutions of Federalism: Toward an Analytical Framework," *National Tax Journal,* Vol. 57 (June), pp. 247–72.

World Bank, 2000, *World Development Report 1999/2000* (Washington).

Wurzel, Eckhard, 1999, "Towards More Efficient Government—Reforming Federal Fiscal Relations in Germany," OECD Economic Department Working Paper No. 209 (Paris: Organization for Economic Cooperation and Development).