

The Dilemma of Fiscal Federalism: Grants and Fiscal Performance around the World

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This article uses cross-national data to examine the effects of fiscal and political institutions on the fiscal performance of subnational governments. Long-term balanced budgets among subnational governments are found when either (1) the center imposes borrowing restrictions or (2) subnational governments have both wide-ranging taxing and borrowing autonomy. Large and persistent aggregate deficits occur when subnational governments are simultaneously dependent on intergovernmental transfers and free to borrow—a combination found most frequently among constituent units in federations. Time-series cross-section analysis reveals that as countries increase their reliance on intergovernmental transfers over time, subnational and overall fiscal performance decline, especially when subnational governments have easy access to credit. These findings illuminate a key dilemma of fiscal federalism and a more precise notion of its dangers: When constitutionally or politically constrained central governments take on heavy cofinancing obligations, they often cannot credibly commit to ignore the fiscal problems of lower-level governments.

A rapid growth in the autonomy and responsibilities of state and local governments is one of the most noteworthy trends in governance around the world in recent decades. This trend, along with the growing autonomy of supra-national bodies like the European Union, has encouraged analysts to reexamine some basic issues facing multi-tiered systems of government. As experiences with federalism unfold, an abstract welfare economics literature emphasizing its efficiency advantages has given way to a more balanced political economy literature that draws attention to questions of institutional design. Much of this new literature points out that decentralization can be dangerous, especially in developing countries. Above all, skeptics point out the difficulties of macroeconomic management, adjustment, and reform in decentralized systems (e.g., Prud'homme 1995) especially when they feature formally federal constitutions that empower states with veto authority over central government decisions (Treisman 1999; Wibbels 2000).

This article addresses one of the most formidable challenges facing multi-tiered systems of government: fiscal indiscipline among subnational governments. A strikingly similar pattern has emerged in developed and developing countries alike: free-spending subnational governments have built up unsustainable deficits and called upon central governments to provide special bailout transfers or otherwise assume their liabilities. These episodes have been extremely costly in countries like Brazil, where subnational fiscal crises have undermined macroeconomic stability by snowballing into systemic financial crises. An impressive array of case studies has recently demonstrated that decentralization may be dangerous indeed if it allows subnational governments to expand their expenditures while externalizing the costs to others (Rodden, Eskeland, and Litvack 2002; Von Hagen et al. 2000).

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While single-country case studies have generated a good deal of useful information and plausible hypotheses, this article breaks new ground by conducting cross-national quantitative analysis. Virtually all cross-national empirical studies of public sector deficits and debt have ignored subnational governments. At first glance this may not seem problematic; during the period from 1986 to 1996 the average subnational deficit was only .42 percent of GDP for a sample of sixty-three countries. However, in eleven formally federal systems—which include several of the world’s largest economies—average subnational deficits exceeded 1 percent of GDP and accounted for nearly 20 percent of total government deficits.¹ In some countries, like Argentina and Brazil, the aggregate subnational deficit routinely surpassed that of the central government and exceeded 2.5 percent of GDP. In rapidly decentralizing countries like Mexico, Spain, and South Africa, subnational deficits are increasing at an alarming rate. Moreover, recent studies have shown that increasing subnational deficits lead to higher central government expenditures and debt (Fornisari, Webb, and Zou 1998), along with higher rates of inflation (Treisman 2000).

This article is a first attempt to answer a question of growing importance—what accounts for cross-country and diachronic variation in aggregate subnational fiscal outcomes? Why do some subnational governments appear to behave as fiscal conservatives, while others run up dangerous and unsustainable deficits? It weaves together an institutional argument from the threads of public economics and political science and tests it using a large data set consisting of observations from OECD, transition, and developing countries from around the world. An important goal is to move beyond some of the simple generalizations in the new literature stressing the dangers of fiscal and political decentralization and add some institutional detail.

While mindful of the situational factors often emphasized in case studies, this article identifies a basic underlying institutional dilemma that can cause subnational officials to view public revenue as a common pool. When the central government is heavily involved in financing subnational governments, it incurs moral, political, and practical obligations that make it difficult to commit to “say no” to entities that overspend, generate unsustainable deficits, and demand bailouts. The second section explains this basic commitment problem and then examines the fiscal and political incentive structures that exacerbate it. First, it hypothesizes that if

subnational governments have access to credit, higher levels of dependence on intergovernmental grants will be associated with larger subnational deficits. Second, it hypothesizes that this commitment problem, and hence the relationship between transfers and deficits, should be most pronounced among state governments in federal systems—especially when the states are directly and disproportionately represented in the upper legislative chamber. The third section introduces the data and explains the econometric approach. The fourth section presents the results of regressions on cross-section averages, the fifth section examines time-series cross-sectional data, the penultimate section summarizes and extends the results, and the final section concludes.

Fiscal Federalism and Commitment

The intergovernmental commitment problem

All multi-tiered governments face the possibility that subnational governments will try to over-fish the common revenue pool by shifting their costs onto others. The problem can be captured by a simple strategic interaction between a central and lower-level government, in which the lower level government decides whether or not to play cost-shifting strategies without knowing the payoffs of the center. For instance, the lower-level government must decide whether or not to undertake a costly new project that will lead to dangerous debt levels, or when faced with a permanent negative revenue shock, it must decide whether to undertake politically painful adjustment measures or fund current expenditures with borrowing. If it funds the project or refuses to adjust, it increases the likelihood that it or one of its successors will be forced to eventually request a special debt-reduction grant or ask that the central government directly take over some of its obligations. The decision about whether to fund the project or adjust to the shock depends upon the anticipated response of the central government in the next stage of the game, when the center decides whether or not to provide a bailout.

Since bailouts are beneficial to the recipient but costly to taxpayers as a whole, the central government will wish to announce firmly *ex ante* that it is resolute—that it *never* prefers bailouts. For a number of reasons this commitment may not be credible *ex post*, however, when defaults loom or schools are about to close. If the central government has access to the requisite funds, local governments may believe that the central government is irresolute—that in this instance it will prefer the bailout to a painful local default or reduction in service

¹Source: IMF, *Government Finance Statistics Yearbook* (various years), *International Financial Statistics* (various years), and author’s calculations.

provision. Even in the absence of externalities or past bailout episodes, the central government's "no bailout" commitment might be undermined by its own incentives, powers, and obligations. The remainder of this article attempts to identify the confluence of institutional factors that undermine the center's commitment and thus encourage subnational governments to over-borrow. That is, it examines some key fiscal and political factors that allow subnational governments and their voters to believe that their fiscal burdens may eventually be borne by others.

Intergovernmental Transfers

H1: Vertical Fiscal Imbalance has a negative effect on subnational fiscal performance. Intergovernmental grants lie at the heart of the commitment problem. If subnational governments were financed purely by local taxes, charges and borrowing, voters and creditors would very likely view the obligations of local governments as "sovereign" like those of central governments—bailout expectations would be irrational. As a matter of both normative theory and descriptive fact, however, intergovernmental systems always involve the vertical flow of funds between governments. Theoretical and empirical studies in public economics suggest that individuals view grants and "own-source" local revenues through different lenses. A key proposition of the "fiscal illusion" literature is that when the link between taxes and benefits is distorted or broken, voters are less likely to sanction overspending by politicians. Intergovernmental grants create the appearance that local public spending is funded by nonresidents.² Grant programs often supply concentrated local benefits that are funded by a common (national) pool of resources (see Weingast, Shepsle, and Johnsen 1988). Local voters, local politicians, and regional representatives within the central legislature all receive fiscal or political benefits from grant programs without internalizing their full cost, causing them to demand more expenditures funded by grants than own-source taxation. The vast empirical literature on the so-called "flypaper effect" shows that increases in intergovernmental grants rarely lead to tax reductions, and increases in transfers stimulate much higher expenditures than do similar increases in locally-generated revenues (for an overview, see Hines and Thaler 1995).

The common theme in this literature is the notion that intergovernmental grants alter perceptions and beliefs about the levels of local expenditure that can be

sustained. An empirical literature has established a link between transfer-dependence and the growth of government (e.g., Winer 1980; Stein 1998; Rodden 2001; Rattsø 2000). I go further and assert that transfer-dependence (as opposed to local revenue mobilization) also alters beliefs about the sustainability of subnational *deficits* by allowing local politicians—along with their voters and creditors—to believe that the central government will ultimately be unable to ignore their fiscal woes. When a highly transfer-dependent local government faces an unexpected adverse fiscal shock, it may not have the flexibility to raise additional revenue, forcing it either to cut services, run deficits, or rely on arrears to employees and contractors. If the situation escalates into a fiscal crisis in which the subnational government is unable to pay workers or service its debt, it can claim with some justification that it is not responsible for the situation.

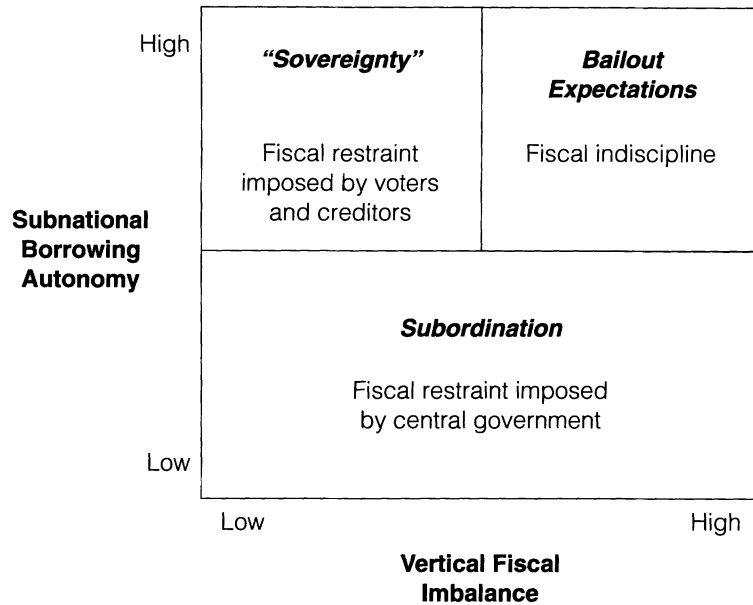
If successful in this strategy, eventually pressure from voters and creditors will likely be directed at the central government, which quite likely *can* resolve the crisis. It may be very difficult for the central government to resist political pressure from bondholders, banks, local parents, or public sector unions. Knowing this, transfer-dependent governments face weak incentives to be fiscally responsible *ex ante*. Even if such subnational governments could take simple but politically costly steps to avoid an impending fiscal crisis, it may be more rewarding to position themselves for bailouts. In fact, credit rating agencies are very explicit in assuming that in countries with high levels of "vertical fiscal imbalance" (transfers as a percent of total subnational revenue), the central government implicitly backs the debt of the subnational governments.³ In such systems, the central government's own creditworthiness might be called into question if it fails to enforce a loan contract against a defaulting subnational government. Approached by creditors and facing the prospect of failing in its obligation to enforce property rights, the central government might see a bailout as the simplest solution.

It is likely that rationality of bailout expectations depends on the structure of the transfer system—e.g., discretionality, matching, earmarking, and redistributiveness—and the flexibility built into the local tax structure in each country. However, for the purpose of cross-national analysis, H1 makes the simple but very plausible hypothesis that the perceived probability of future bailouts—and hence subnational deficits—increases with overall transfer-dependence.

²This literature is too large to review here. For an overview of concepts and measurements of fiscal illusion and a literature review, see Oates (1991). For a theoretical application to intergovernmental grants in particular, see Oates (1979).

³Thus at high levels of vertical fiscal imbalance, subnational credit ratings may reflect the creditworthiness of the central government or entire public sector rather than that of the individual government. Witness the uniform triple A ratings of the German Länder (in spite of widely divergent fiscal health).

FIGURE 1 Hypothesized Relationships Between Vertical Fiscal Imbalance, Borrowing Autonomy, and Fiscal Restraint



Borrowing Restrictions

H2: Central governments will place restrictions on subnational borrowing autonomy when vertical fiscal imbalance is high. Aware of its vulnerability to manipulation, the central government’s first line of defense is to make a credible no-bailout commitment (Inman 2002). If this commitment is undermined by its co-financing obligations in a system with high vertical fiscal imbalance, the central government will likely turn to a second line of defense. Like a vulnerable parent who takes away a child’s credit card, the central government may head off the moral hazard problem by formally restricting local governments’ spending and access to credit. A wide range of strategies have been used around the world, including outright prohibitions on borrowing, limits on foreign debt, numerical debt ceilings, restrictions on the use of debt, and balanced budget requirements (Ter-Minasian and Craig 1997). In fact, empirical evidence seems to suggest that these restrictions are a direct response to the commitment problem—Eichengreen and von Hagen (1996) examine H2 and demonstrate that fiscal restrictions are indeed most often found in countries with high levels of vertical fiscal imbalance.

H3: Vertical fiscal imbalance will only affect subnational fiscal performance at high levels of borrowing autonomy. Previous studies have not asked whether hierarchical borrowing restrictions are mere parchment barriers

or whether they restrict subnational fiscal behavior in practice.⁴ If they are effective, one should modify H1 and expect the interactive relationship between transfer-dependence, borrowing autonomy, and fiscal performance suggested by H3. If vertical fiscal imbalance is indeed associated with subnational fiscal indiscipline, the relationship should only hold when subnational governments have relatively unrestricted access to borrowing. That is, subnational fiscal indiscipline should be most pronounced in cases where vertical fiscal imbalance and borrowing autonomy are both high. This is represented by the upper right-hand corner of Figure 1, which depicts vertical fiscal imbalance on the horizontal axis and borrowing autonomy on the vertical axis. At low levels of vertical fiscal imbalance and high levels of borrowing autonomy (the upper left hand corner), voters and creditors view subnational obligations as “sovereign” and face incentives to keep local governments on a tight leash. Creditors punish profligacy with higher interest rates, and voters, knowing that the costs ultimately fall on them, punish politicians at the polls. Thus subnational politicians are not tempted to play cost-shifting strategies. When formal borrowing autonomy is low (both lower quadrants in Figure 1), deficits are kept under control by the heavy hand of the central government.

⁴Studies of the US states have addressed voter-imposed local restrictions, but not hierarchical restrictions imposed by central governments.

But if H3 is correct, it merely raises an additional question—why should any cases fall into the upper right-hand cell? Why would a vulnerable central government with heavy co-financing obligations ever allow subnational governments to borrow?

Political Federalism and Territorial Representation

H4: Political federalism undermines the central government's ability to restrict subnational borrowing. “For an economist, nearly all public sectors are more or less federal in the sense of having different levels of government that provide public services, irrespective of formal constitution” (Oates 1999, 1121). For political scientists, however, federalism is much more than mere fiscal decentralization—it implies that the autonomy of the central government is effectively limited, either by constitutional rules or informal constraints. In most federal systems, the constituent units had at least some influence in the formulation of the original constitutional contract. As a result, federal institutions often restrict the authority of the central government with explicit constitutional protections of the subunits, which are often enforced by independent courts. Perhaps the most central feature of political federalism is the fact that in at least some policy areas, the central government is unable to change the policy status quo without the agreement of a majority, supermajority, and sometimes even unanimity of the constituent units. Often this is the case because the units are directly represented in the upper chamber of Congress or Parliament.

As a result of federal constitutional bargains, one important difference between unitary and federal democracies is the extensive deviation of the latter from the “one person-one vote” principle. While most democracies deviate from this principle to some extent through the legislative overrepresentation of small, usually rural districts, small states in most federations have been able to secure vastly disproportionate representation in the upper house of the legislature, and sometimes the lower house as well (Stepan 1999; Samuels and Snyder 2001). Virtually all of the distinguishing characteristics of political federalism imply limits on the central government's ability to regulate the fiscal activities of the states or provinces. Not only is the expenditure autonomy of the provinces generally protected by the constitution, but their representation in the upper chamber often gives them veto power over any proposals that would limit their funding or autonomy.

H5: Political federalism undermines subnational fiscal discipline.

H6: The effect of federalism on subnational fiscal discipline is conditional on vertical fiscal imbalance. Even without an effect on borrowing autonomy, one might expect the unique territorial representation of federalism to increase the perceived probability that the center is irresolute. Policy making in federations includes an element of bargaining among territorial units that often obviates any notion that decisions are made by a national median voter (Cremer and Palfrey 1999). The complex regional bargaining and log-rolling that often characterize the legislative process in federations might allow distressed states to trade votes on unrelated regional projects for bailouts. The asymmetry of jurisdiction size in federations might also exacerbate the commitment problem if the failure of a large state might create negative externalities for the rest of the federation—the “too big to fail phenomenon” (Wildasin 1997). At the same time, a small overrepresented jurisdiction might be “too small to fail” if it is in an especially favorable position to trade votes for bailouts that would be relatively inexpensive for the other constituent units to provide (Von Hagen et al. 2000). Based on such considerations, recent studies by political scientists posit a direct link between federal political institutions and fiscal indiscipline (Triesman 2000; Wibbels 2000).

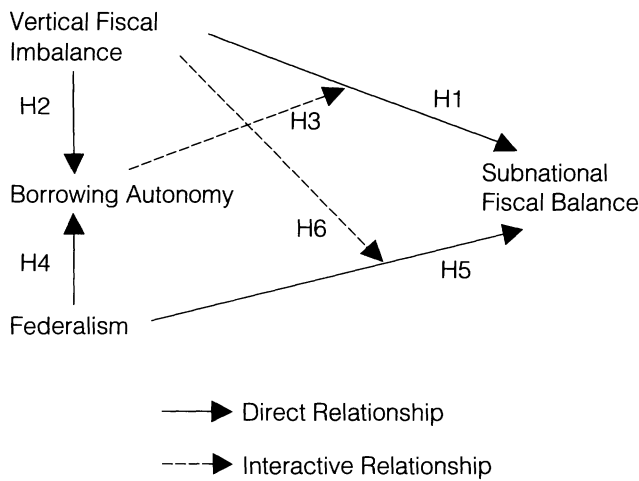
In short, political federalism might weaken both lines of defense. H4 suggests that it undermines the center's ability to restrict subnational borrowing. That is, states and provinces in federations will be higher in Figure 1 than municipalities in unitary systems. But federalism might have an independent effect on the center's ability to commit in the first place (H5). That is, the presence of federal institutions might be associated with poor subnational fiscal performance no matter where a country falls in Figure 1.

Alternatively, H6 suggests an interactive relationship. H1 argues that at low levels of vertical fiscal imbalance, the center can credibly commit to remain uninvolved in the fiscal affairs of subnational governments, and voters and creditors hold local politicians responsible for their own fiscal management. If federalism places credible restrictions on the center, this might actually bolster its commitment when the constituent units are self-financing, but undermine it when they are dependent on the central government for funds. Returning to Figure 1, H6 suggests that federalism should undermine subnational fiscal discipline only on the right-hand side.

Figure 2 summarizes all of these possibilities, using bold lines to represent direct relationships and dashed lines for interactive relationships.⁵ H1 hypothesizes a

⁵The author wishes to thank an anonymous reviewer for suggesting this presentation.

FIGURE 2 Summary of Hypotheses



simple relationship between vertical fiscal imbalance and subnational fiscal performance. H5 asserts a simple relationship between federalism and subnational deficits. H3 and H6 are the interactive hypotheses: H3 suggests that the effects of vertical fiscal imbalance and borrowing autonomy are conditional on one another, and H6 suggests that the effects of vertical fiscal imbalance and federalism are conditional on one another. Finally, H2 and H4 acknowledge the potential endogeneity of borrowing autonomy.

Data

The rest of this article examines these propositions, first using cross-section averages and then using time-series cross section analysis. The data set is composed of yearly observations for forty-three cases drawn from a cross-section of OECD, developing, and transition countries for the period between 1986 and 1996. Each observation represents an aggregate state or local government sector.⁶ Some federal countries provide two separate data points—state and local.⁷ Given the arguments above and the important differences between states and local governments in federations, it is necessary to include both states and local governments for the same country separately, introducing appropriate controls and testing for separate effects. The sample contains all state or local government sectors for which complete data could be obtained.

⁶For a list of cases and data sources, see Appendix A.

⁷The exceptions are Argentina and India, for which only state-level data were available.

Main Variables

The first task is to come up with a comparable measure of subnational fiscal discipline to use as a dependent variable. Recall that the argument does not predict actual bailouts, but rather a higher tolerance for deficits and debt stemming from rational bailout *expectations*. Subnational debt data are unavailable, but the IMF’s *Government Finance Statistics* (GFS) collects yearly data on subnational budget balance. Of course short-term budget deficits may reflect inter-temporal tax- or expenditure-smoothing or counter-cyclical budgetary policy. One way to minimize the impact of economic cycles is by using averages over a sufficiently long time period. Another is to include controls for exogenous macroeconomic fluctuations. Both strategies are employed below.

To facilitate cross-national and time-series comparison, the surplus data might be divided either by expenditure, revenue, or GDP. While appropriate for time-series analysis within countries, GDP is a less desirable denominator for cross-national comparison because of large cross-national differences in public sector size and degree of decentralization. For the analysis of cross-country averages, it makes sense to use surplus as a share of subnational revenue or expenditure. Since revenues are partially determined by the central government, the most appropriate cross-national measure of subnational fiscal discipline is the deficit/surplus as a share of expenditures.

To operationalize the most important independent variable, it is necessary to distinguish between intergovernmental grants and “own-source” subnational revenue. Previous studies that attempt to quantify this distinction do so by using the GFS (e.g., Watts 1996; Fukasaku and de Mello 1998), which codes revenues from tax-sharing arrangements (taxes that are levied and collected by the central government and automatically transferred to the states) as “own-source” revenues. While these data might be useful for tracking changes in grants over time, they badly overestimate local revenue autonomy for a number of countries in which subnational governments have very little taxing authority. For this reason, I have created a more useful (for the task at hand) measure of vertical fiscal imbalance (grants/revenue) that codes shared revenues as grants by consulting a variety of additional sources (see Appendix 1). The correlation between this measure and that used elsewhere is only .46. The disadvantage of this measure is that it does not vary over time because some of the sources did not include sufficient time-series variation. However, as long as the empirical set-up controls for cross-section effects, the GFS “grants” variable may be useful for the analysis of time-series variation.

Borrowing autonomy is measured by building on a legal-institutional index created by the Inter-American Development Bank for a sample of Latin American countries. I have used a slightly modified version of the IDB formula to measure borrowing autonomy for a larger sample of subnational governments.⁸ Taken together, these new data on intergovernmental transfers and borrowing autonomy represent a significant improvement over previous cross-national data sets dealing with fiscal decentralization. Among the cases for which the fiscal data are available, the following countries are coded as federal because of the special constitutional status of the states or provinces: Argentina, Australia, Austria, Brazil, Canada, Germany, India, Mexico, Spain, Switzerland, and the United States.⁹

Control Variables

It is possible that central governments in federations make less credible commitments to “say no” to states not because of legislative politics, but simply because states and provinces are larger and more difficult to ignore than municipalities or local governments. To evaluate this claim, I calculate the average number of persons per jurisdiction in each subnational sector.¹⁰ This variable ranges from around 1500 for the French municipalities to over 25 million for the Indian states. It is also plausible that political federalism is merely a byproduct of large country size. Thus I include controls for area (logged square kilometers), and logged population. It may be more difficult for subnational governments to balance their budgets when they are responsible for a wider range of expenditure activities. Thus a control is included for the overall level of decentralization—subnational expenditures as a share of total public sector expenditures (calculated from the GFS). It is also important to control for economic and demographic conditions that may affect subnational fiscal performance. Thus I include the log of real GDP per capita (PPP, international dollars from WDI), expecting a positive relationship. Since subnational governments are

⁸The index is explained in Appendix 2. It is similar to the IDB (1997, 173–176) formula, but instead of calculating a weighted average of state and local governments in federal systems, I calculate separate values for state and local governments and include restrictions placed on municipal governments by state-provincial governments. In addition, I do not count borrowing restraints imposed by state and local governments on themselves. In accordance with the argument, this index seeks to capture the attempts of higher-level governments to restrict local borrowing.

⁹This is in accordance with other recent attempts to code federalism. See, e.g., Watts (1996), Elazar (1995), and Treisman (2000).

¹⁰Population data are from the World Bank’s *World Development Indicators* (henceforth WDI) and jurisdiction data are taken from the World Bank’s *World Development Report 1999/2000*, Table A.1.

often responsible for providing primary education and retirement benefits, it is useful to control for the portion of the population that is either too old or too young to work—the so-called “dependency ratio.” Another common demographic control, population density, is included as well (both are from WDI).

Other aspects of a country’s institutions might also affect the central government’s ability to commit not to provide bailouts. Above all, it might be easier to commit if the center itself faces a hard budget constraint in the form of an independent central bank (Dillinger and Webb 1999). Bailout expectations are more rational if the central government can “resolve” a subnational fiscal crisis by printing more money. Thus I include Cukierman’s (1992) legal-institutional index of central bank autonomy. Additionally, since Persson and Tabellini (1998) find important differences in fiscal behavior between presidential and parliamentary democracies, I include a variable from the World Bank’s *Database of Political Institutions (DPI)* that takes on 0 for pure presidential systems, 1 for systems with assembly-elected presidents, and 2 for pure parliamentary systems. Furthermore, it may be useful to control for partisan fragmentation in the central government. One might hypothesize that the central government is in a better position to “say no” to bailout requests if the president presides over a unified legislature in presidential systems, or if the Prime Minister in a parliamentary system need not hold together a diverse coalition. Thus I include the index of political cohesion developed by Roubini and Sachs (1989).¹¹ The fiscal woes of subnational governments might also be related to those of higher-level government, so I include the central government’s surplus/expenditure ratio for all governments and an additional variable that measures the state or province’s surplus/expenditure ratio for local governments in federal systems (and takes on zero for other observations).

Cross-Section Analysis

Ideally, the propositions from section two would be tested using time-series data disaggregated to the level of individual states and localities. In order to differentiate

¹¹Taken from the DPI, this variable takes on 0 for presidential systems under unified government, and 1 under divided government. For parliamentary systems, it takes on 0 for one-party government, 1 for a two-party coalition, 2 for a coalition with three or more parties, and 3 for minority government. Similar results to those presented below are obtained using a variety of other “government fragmentation” variables from the DPI, including a more complex “veto player” index and the effective number of political parties.

between counter-cyclical fiscal management and fiscal laxity, it would also be useful to differentiate between expected and unexpected shocks. While such analysis is possible in single-case studies, data limitations would make cross-national comparison virtually impossible. My goal is to make the most of the cross-national data described above. This is best achieved by combining two strategies. This section examines long-term, purely cross-sectional relationships using “between-effects” OLS regressions on ten-year averages.¹² While the disadvantages are obvious, this approach has some advantages: it allows for the use of a more appropriate measure of vertical fiscal imbalance that cannot vary over time, and it allows for some broad generalizations about the kinds of systems in which subnational deficits are most persistent. Moreover, the cross-section results help provide background for the second empirical strategy—time-series cross-section analysis that (by necessity) uses a narrower definition of vertical fiscal imbalance, controls for cross-section effects, and examines changes over time.

The first goal is to estimate a model of average subnational surplus and ascertain whether vertical fiscal imbalance and federalism have direct or more complex interactive effects. Furthermore, there are good reasons to suspect that the relationship is complicated by an intervening variable—borrowing autonomy. Thus the empirical model must accommodate H2 and H4 by allowing federalism and vertical fiscal imbalance to affect borrowing autonomy. This calls for a system of equations in which borrowing autonomy is endogenous. Leaving aside H3 and H6 (the interactive hypotheses) for the moment, the following structural model makes it possible to test H1, H2, H4, and H5 simultaneously:

$$\text{Surplus} = a_1 + a_2\text{VFI} + a_3\text{Borrow Autonomy} + a_4\text{Federalism} + a_{i\dots}\text{Controls} + \nu \quad (1)$$

$$\text{Borrow Autonomy} = b_1 + b_2\text{VFI} + b_3\text{Federalism} + b_4\text{Log GDP per Capita} + b_5\text{Log Population} + b_6\text{System} + w, \quad (2)$$

where federalism, GDP per capita, vertical fiscal imbalance, population, system (the presidential/parliamentary variable) and all control variables are treated as exogenous. Using three-stage least squares, the parameters of equations 1 and 2 are estimated simultaneously.¹³

¹²A slightly shorter time-series is available for some of the cases. The results presented below are not affected by the deletion of these cases, nor are they affected by limiting the data period to the years that are common to all cases.

¹³A variety of other right-hand side variables have been included in equation 2, but only these approached statistical significance. To

The results are reported in the first column of Table 1. First, note that the borrowing autonomy equation performs quite well. Recall that the Eichengreen/von Hagen hypothesis (H2) assumes that the central government is a rational, unconstrained unitary decision maker, and as such, it would choose to tightly regulate subnational borrowing when vertical fiscal imbalance is high. H4 relaxes these assumptions and proposes that federal institutions constrain the central government’s range of choices. Strong support is found for both propositions. Countries with higher levels of vertical fiscal imbalance indeed demonstrate lower levels of subnational borrowing autonomy, and states and provinces in federations do have significantly freer access to deficit finance than local or municipal governments. The results also suggest that central governments in wealthier, more populous, and presidential (as opposed to parliamentary) countries allow subnational governments freer access to credit markets.

In the subnational surplus equation, on the other hand, the variables of interest do not approach statistical significance in any specification—even if insignificant control variables are dropped, and even if a simpler single-equation OLS model is used. Thus no support is found for H1 or H5. Though vertical fiscal imbalance and federalism help explain levels of borrowing autonomy, they do not have independent effects on subnational fiscal performance.

Model 2 estimates the same structural model, but it examines H3 by including a multiplicative interaction term. Adding the interaction term raises the R^2 of the surplus equation from .68 to .77, and the variables of interest are individually and jointly highly significant. The best way to interpret the interaction is with reference to Figure 3, which plots the conditional effect of vertical fiscal imbalance with a bold line and the 95 percent confidence interval with dotted lines. The horizontal axis displays the range of the borrowing autonomy index (from one to five). Figure 3 shows that when subnational governments face strict formal limitations on their ability to borrow, vertical fiscal imbalance has a small positive effect on fiscal balance. But as subnational governments gain independent access to credit, vertical fiscal imbalance has an increasingly negative impact on budget balance. To get a sense of the substantive predictions of the model, it is useful to calculate predicted values of long-run deficits when borrowing autonomy and vertical fiscal imbalance are at low and high levels—20th and 80th percentile values—and all other variables are held at

meet the order condition, population (which never achieves significance in any model of subnational fiscal balance) is not included in Equation 1. A variety of alternative three-stage specifications yielded very similar results.

TABLE 1 Simultaneous Estimates of Average Subnational Fiscal Balance and Borrowing Autonomy (1986–1996)

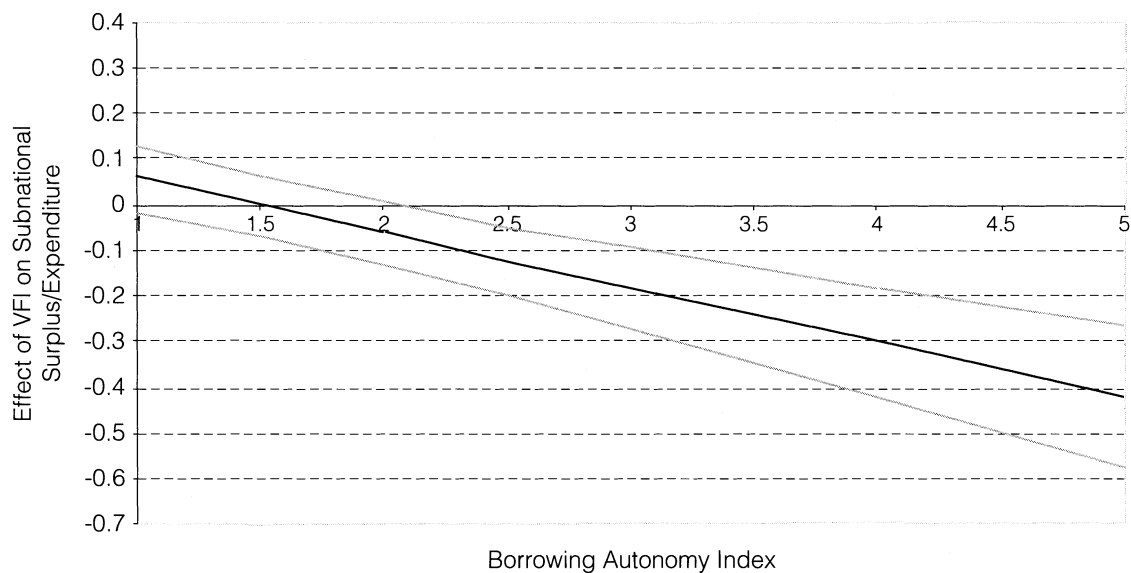
	Model 1		Model 2		Model 3	
Subnational Surplus/Expenditure Equation						
Vertical Fiscal Imbalance	-0.062	(0.098)	0.232926	(0.052)***		
Borrowing Autonomy	-0.037	(0.073)			-0.018	(0.057)
Federal Dummy	-0.020	(0.077)	0.020	(0.021)		
(VFI)×(Borrowing Autonomy)			-0.143	(0.023)***		
(VFI)×(Constituent unit in Federation)					-0.084	(0.043)**
(VFI)×(Local Government)					-0.010	(0.110)
Persons per Jurisdiction	-0.004	(0.004)	-0.006	(0.003)**	-0.004	(0.003)
Log Area	0.005	(0.009)	0.010	(0.006)	0.0023	(0.009)
Subnational Expenditure/Total	-0.190	(0.131)	-0.183	(0.068)***	-0.209	(0.147)
Log GDP per Capita	0.017	(0.038)	0.021	(0.014)	0.009	(0.034)
Dependency Ratio	-0.010	(0.120)	-0.064	(0.080)	-0.017	(0.125)
Population Density	0.00001	(0.0002)	0.0001	(0.0001)	-0.00003	(0.0002)
Central Bank Independence	0.026	(0.091)	-0.013	(0.046)	0.028	(0.076)
System (Pres/Parl)	-0.002	(0.023)	-0.012	(0.010)	0.002	(0.020)
Index of Political Cohesion	0.003	(0.016)	0.014	(0.011)	0.005	(0.013)
Central Govt. Surpl./Expenditure	-0.123	(0.205)	-0.203	(0.088)**	-0.124	(0.166)
State–Prov. Surpl./Exp	0.724	(0.208)***	0.760	(0.175)***	0.711	(0.206)***
Constant	-0.103	(0.320)	-0.262	(0.170)	-0.048	(0.314)
"R ² "	0.68		0.77		0.63	
Borrowing Autonomy Equation						
Vertical Fiscal Imbalance	-1.437	(0.490)***	-1.438	(0.490)***	-1.439	(0.490)***
Federal Dummy	0.961	(0.224)***	0.962	(0.224)***	0.966	(0.221)***
Log GOP per Capita	0.411	(0.141)**	0.411	(0.141)**	0.411	(0.141)**
Log Population	0.135	(0.078)*	0.134	(0.078)*	0.133	(0.077)*
System (Pres/Parl)	-0.206	(0.122)*	-0.206	(0.122)*	-0.207	(0.122)*
Constant	-3.216	(2.042)	-3.199	(2.042)	-3.180	(2.027)
"R ² "	0.56		0.56		0.56	
Groups	37		37		37	

3-stage least squares, Standard Errors in parentheses, *** $p < .01$, ** $p < .05$, * $p < .10$

their mean values. At both low and high levels of vertical fiscal imbalance, the model predicts balanced budgets or small surpluses when subnational governments face substantial borrowing restrictions (the lower cells in Figure 1 above). It predicts reasonable deficits (around 5 percent of expenditures) when governments are largely self-financing and have wide-ranging borrowing authority (the upper left cell), and large long-run deficits (around 14 percent of expenditures) where high levels of borrowing autonomy and vertical fiscal imbalance combine (the upper right cell).

Moving on to H6, model 3 holds borrowing autonomy constant and examines separate effects of verti-

cal fiscal imbalance for constituent units in federations and local governments. Consistent with H6, vertical fiscal imbalance only has a significant negative effect on subnational fiscal outcomes among states and provinces. Substantively, once again holding all control variables at their mean values, this model predicts long-term deficits of only around one percent of expenditures among *local* governments at both low (20th percentile) and high (80th percentile) values of vertical fiscal imbalance. Among constituent units in federations, the model predicts a 3 percent deficit when vertical fiscal imbalance is at the 20th percentile value and a 7 percent deficit when at its 80th percentile value.

FIGURE 3 Conditional Effect of Vertical Fiscal Imbalance on Subnational Surplus/Expenditure

Given the results of models 2 and 3, it seems possible that the best model would combine them by using a triple interaction term. Specifically, it is possible that the $(VFI) \times (\text{Borrowing Autonomy})$ result in model 2 is driven primarily by federated units. However, a model including separate effects for federated units and local government (not shown) demonstrates significant, negative coefficients for both that resemble the coefficient for the interaction term in Model 2. This suggests that the effect of vertical fiscal imbalance is contingent on borrowing autonomy (and vice-versa) among *both* federated units and local governments, but the result should be approached with caution because of the small number of observations.

More generally, one should be skeptical about regression analysis using noncontinuous indexes. As a robustness check, models 1 through 3 have been estimated using a simpler dummy version of the borrowing autonomy index (with the median value used as the cut-point), and all of the results were quite similar.¹⁴ But it should be noted that with respect to the borrowing autonomy index, ten of the federated units are above the median, and only one (Austria) is below. Of twenty-six local governments in the sample, nine are above and seventeen are below. This underscores the difficulty of distinguishing between the effects of federalism and borrowing autonomy in the cross-section analysis.

¹⁴Additionally, none of the main results are affected by including or excluding control variables, including a matrix of region dummies, or dropping individual cases. Similar results have also been obtained using equation-by-equation OLS.

To summarize the results, vertical fiscal imbalance and federalism affect long-term fiscal balance, but in a complicated and contingent way.¹⁵ First of all, there is no support for H1—vertical fiscal imbalance does not have a direct independent effect on subnational fiscal outcomes; but there is support for H2—at higher levels of vertical fiscal imbalance, central governments attempt to cut off subnational access to credit markets. Perhaps the most important result is in support of H3—when relatively free to borrow, more transfer-dependent subnational sectors are likely to run larger long-term deficits. As for H5, other things equal, federated units do not run significantly larger deficits than local governments. But federated units have much greater access to credit than local governments (H4), and the largest subnational deficits in the sample are found among federations with high levels of transfer-dependence (H6). The coincidence of

¹⁵The performance of the control variables can be summarized as follows. “Persons per jurisdiction” has the hypothesized negative sign in each model, but statistical significance is quite sensitive to the precise specification. Land area is unrelated to subnational fiscal performance. As expected, the models show that expenditure decentralization is associated with larger deficits, but statistical significance is sensitive. There is no evidence that wealth affects subnational fiscal performance, and the coefficient for the “dependency” ratio, though negative as expected, does not achieve significance in many specifications. Coefficients for population density, central bank autonomy, executive-legislative relations, and central government political cohesion are not significantly different from zero. Surprisingly, the central government’s long-term fiscal performance is not positively correlated with subnational fiscal performance, but the fiscal performance of local governments in federal systems is intertwined with that of the states and provinces.

wide-ranging borrowing autonomy, high vertical fiscal imbalance, and large deficits is found primarily among constituent units in federal systems, but the contingent relationship between borrowing autonomy and vertical fiscal imbalance appears to hold up among both federated units and local governments.

Time-Series Cross-Section Analysis

While cross-section averages are admittedly blunt, these results establish the key determinates of long-run subnational deficits. A natural further step is to examine the effects of intergovernmental transfers on the evolution of fiscal performance over time within countries. Building on the cross-section results presented above, this section focuses on time series rather than cross-section variation and asks whether and under what conditions the growth of grants over time might affect deficits. That is, it examines diachronic versions of H1, H3, H5, and H6. H1 posits that the growth of transfer-dependence, by increasing fiscal separation and encouraging bailout expectations, leads to growth in subnational deficits. H3 and H6 posit, respectively, that this relationship will be conditional on the presence of borrowing autonomy and political federalism. H5 posits that subnational deficits will grow more rapidly in federations.

Dynamic analysis is particularly useful from a policy perspective; countries are decentralizing expenditure authority in many countries around the world, and in most cases, these new subnational expenditures are funded by increased intergovernmental transfers rather than new own-source local taxes and fees. Given the present concern in the literature about the supposed macroeconomic dangers of decentralization, this section provides an exploration of the fiscal and political conditions under which decentralization might lead to upward pressure on deficits.

In order to make use of time-series data, it is necessary to rely on the GFS distinction between “own-source” and “grant” revenue. This may not be a disadvantage, however, since the GFS conception of “grants” zeros in on the more discretionary grants that show up in yearly budgets, and any problems of cross-national comparability will be obviated by an empirical approach that focuses exclusively on time-series variation. The goal of the empirical set-up is to eliminate cross-section variation and focus exclusively on changes. Given the relatively short (ten years for most countries) period under analysis, the customary approach to this kind of time-series cross-country

data used in political science—OLS with panel corrected standard errors, including fixed effects and a lagged dependent variable (Beck and Katz 1995)—may lead to bias. In order to avoid the potential bias associated with this approach and assuage concerns about endogeneity, the results presented below are from estimations that use the GMM estimator derived by Arellano and Bond (1991). This approach relies on the use of first-differences to remove the fixed effects part of the error term and instrumental variable estimation, where the instruments are the lagged explanatory variables (in differences) and the dependent variable lagged twice. As recommended by Arellano and Bond, (1991), one-step robust results are presented and used for inference on coefficients.

The most straightforward model—displayed in Table 2 (model 4)—explores changes in the same dependent variable used above: the subnational deficit/expenditure ratio. The key dependent variable is the change in grants as a share of subnational revenues. An important control variable is subnational revenue as a share of total (combined state, central, and local) revenue. This set-up allows one to compare the impact of growing revenue decentralization, and that of having more of the revenue tilted towards grants. The model also includes two lags of the dependent variable, changes in all of the other control variables that vary over time, levels for those that do not, and a set of dummies for each subnational sector.¹⁶

In order to examine H1, model 4 includes only grants/revenue, while model 5 examines H3 and H6 by breaking this variable down and estimating separate effects for systems with high and low levels of borrowing autonomy (above and below the median value), and within these categories, separate effects for local/municipal governments and constituent units in federations. H5 is examined in each model by including the dummy variable that distinguishes between federated units and local governments. In both models, it is not surprising that the coefficient for “subnational revenue/total revenue” is positive and significant; as subnational governments receive larger shares of total government revenue, their fiscal positions improve. In model 4, although the coefficient for

¹⁶The one-step model performs quite well. A Wald test of the null that all of the coefficients except the constant are zero is soundly rejected. A Sargan test of over-identifying restrictions cannot reject the null hypothesis that the over-identifying restrictions are valid. The presence of first-order autocorrelation in the differenced residuals does *not* imply that the estimates are inconsistent, though the presence of second-order autocorrelation *would* imply this (Arellano and Bond 1991). An Arellano-Bond test soundly rejects the null of no first-order autocorrelation in the differenced residuals, but it is not possible to reject the null of no second-order autocorrelation.

TABLE 2 Determinates of Changes in Subnational Surplus/Expenditure, Dynamic Panel Data Analysis

	Model 4		Model 5	
<i>Dependent Variable:</i>				
Δ Subnational Surplus/Expenditure				
<i>Independent Variables:</i>				
Δ Subnational Surplus/Expenditure _{t-1}	-0.008	(0.124)	0.044	(0.114)
Δ Subnational Surplus/Expenditure _{t-2}	-0.187	(0.077)**	-0.183	(0.065)***
Federal Dummy	0.001	(0.005)	-0.004	(0.005)
Borrowing Autonomy Index	-0.003	(0.003)	0.002	(0.004)
Δ Grants/ Subnational Revenue	-0.058	(0.087)		
(Δ Grants/ Subnational Revenue) x (<i>High</i> Borr. Aut) x (<i>Federal</i>)			-0.319	(0.081)***
(Δ Grants/ Subnational Revenue) x (<i>High</i> Borr. Aut) x (<i>Local</i>)			-0.536	(0.216)***
(Δ Grants/ Subnational Revenue) x (<i>Low</i> Borr. Aut) x (<i>Federal</i>)			0.390	(0.072)***
(Δ Grants/ Subnational Revenue) x (<i>Low</i> Borr. Aut) x (<i>Local</i>)			0.049	(0.101)
Δ Subnational Revenue/Total Govt. Rev.	0.451	(0.218)**	0.514	(0.227)***
Δ Population (log)	0.019	(0.017)	0.022	(0.019)
Log Area	-0.001	(0.001)	0.001	(0.003)
Δ GDP per capita (log)	0.027	(0.019)	0.019	(0.015)
Δ Dependency Ratio	-0.075	(0.095)	-0.023	(0.081)
Δ Population Density	-0.001	(0.001)	0.003	(0.003)
System (Pres/Parl)	0.007	(0.010)	-0.010	(0.010)
Index of Political Cohesion	0.007	(0.003)**	0.004	(0.003)
Δ Central Govt. Surplus/Expend.	0.002	(0.040)	0.003	(0.044)
Δ State-Prov. Surplus/Expend. (fed)	0.190	(0.138)	0.191	(0.125)
Constant	0.011	(0.023)	-0.0003	(0.031)
Observations		272		272
Number of Groups		37		37

Robust standard errors in parentheses

*significant at 10%; **significant at 5%; ***significant at 1%

Estimates for fixed unit effects not reported.

Calculated using Stata 7.0, "xtabond" procedure, one step results

grants/subnational revenue is negative as predicted by H1, it is not significantly different from zero. However, Model 5 demonstrates very clearly that the coefficient is negative and highly significant, as predicted by H3, among cases with high levels of borrowing autonomy, regardless of status as federated units or local governments. Recall from above that there are ten state-provincial sectors and nine local sectors with "high" levels of borrowing autonomy, and the coefficients suggest that a one percent increase (decrease) in transfer-dependence is associated with .32 percent and .54 percent declines (improvements) in fiscal balance (as shares of expenditure) respectively. The sig-

nificant positive coefficient for federated units with low levels of borrowing autonomy is driven exclusively by Austria. For the remaining cases—the local government sectors with low levels of borrowing autonomy—the coefficient is positive but not significant.

The results presented in Table 3 lend support neither to H5 nor H6. There is no evidence that deficits grow more quickly among federated units—in no estimation does the "federal" dummy approach statistical significance. Furthermore, among subnational sectors with substantial borrowing autonomy, growing transfer-dependence does not have a larger effect on fiscal

TABLE 3 Simultaneous Estimates of Average Total Fiscal Balance and Borrowing Autonomy (1986–1996)

Model 6		
Total Surplus/Expenditure Equation		
Vertical Fiscal Imbalance	0.092	(0.086)
Federal Dummy	0.019	(0.038)
(VFI)×(Borrowing Autonomy)	-0.104	(0.032)***
Persons per Jurisdiction	0.041	(0.051)
Log Area	0.023	(0.009)**
Subnational Expenditure/Total	-0.109	(0.107)
Log GDP per Capita	0.030	(0.027)
Dependency Ratio	-0.306	(0.144)**
Population Density	-0.000001	(0.000003)
Central Bank Independence	0.096	(0.080)
System (Pres/Parl)	-0.008	(0.015)
Index of Political Cohesion	0.001	(0.019)
Constant	-0.397	(0.306)
"R ² "		0.72
Borrowing Autonomy Equation		
Vertical Fiscal Imbalance	-1.429	(0.644)**
Federal Dummy	0.593	(0.296)**
Log GDP per Capita	0.371	(0.189)*
Log Population	0.190	(0.105)*
System (Pres/Parl)	-0.056	(0.154)
Constant	-3.826	(2.741)
"R ² "		0.47
Groups		28

3-stage least squares, Standard Errors in parentheses.

*** $p < .01$, ** $p < .05$, * $p < .10$

outcomes among federated units than among local governments. In fact, the negative coefficient is larger for local governments.¹⁷

Total Public Sector Deficits

There are reasons to suspect that subnational fiscal indiscipline affects not only the state or local government sector in question, but the entire public sector. In fact, one

¹⁷All of these results are quite robust. Similar results are obtained with and without fixed effects and year dummies, and the results are not affected by the deletion of cases. Similar results are obtained when the dependent variable is measured relative to GDP

possible objection to the use of subnational fiscal balance as the dependent variable is the possibility that soft local budget constraints and bailouts might affect the finances of the central government in addition to, or perhaps even instead of the local governments. For this reason it is useful to reexamine the key results using *total* (combined central, state, and local) fiscal balance as the dependent variable. Of course this requires some changes to the data set and model specifications since states and local governments within federations can no longer be individual data points. Vertical fiscal imbalance and borrowing autonomy in federations must now be based on a weighted (by expenditure share) average of state and local governments. "Grants/Revenue" now refer to totals for all subnational governments. In addition, the control variables measuring fiscal balance for higher-level governments must be left out.

Table 3 presents the results of a model that simply reestimates Model 2 from above using average aggregate deficit/expenditure as the dependent variable.¹⁸ Though the coefficient on the interaction variable is slightly smaller than in the subnational deficit model, the result is quite similar and survives all of the robustness checks outlined above. When subnational governments are free to borrow, higher reliance on intergovernmental transfers is associated with larger aggregate deficits not just for the subnational sector, but for the entire public sector.

Table 4 presents two models that extend the panel data analysis to total public sector deficits. Model 7 is the simple model, and model 8 includes separate effects. First of all, note that the coefficient for subnational revenue/total revenue is negative and significant in both models, suggesting that other things equal, revenue decentralization is associated with a rather large decline in overall fiscal balance. While this lends some empirical support to the fear that fiscal decentralization can harm budget balance, once again, more precise institutional details are important. As in Table 2, the coefficient for the grants/revenue variable has a negative coefficient in the simple model, but it does not quite reach statistical significance. Model 8 shows that as in the subnational deficit models, the negative coefficient is driven by the cases with substantial borrowing autonomy, the coefficients for which are negative, substantively large, and significant. Thus when subnational governments are free to borrow, growing transfer-dependence is associated with growing total deficits, and once again, contrary to H6, the effect is larger in unitary systems.

rather than expenditure, and with a variety of other estimation techniques.

¹⁸All of the results in this section are quite similar if the dependent variable is calculated as a share of GDP rather than expenditures.

TABLE 4 Determinates of Changes in Total (Central + Subnational) Surplus/Expenditure, Dynamic Panel Data Analysis

	Model 7		Model 8	
<i>Dependent Variable:</i>				
Δ Total Surplus/Expenditure				
<i>Independent Variables:</i>				
Δ Total Surplus/Expenditure _{t-1}	0.354	(0.192)*	0.352	(0.173)**
Δ Total Surplus/Expenditure _{t-2}	-0.231	(0.125)	-0.195	(0.130)
Federal Dummy	-0.030	(0.050)	-0.005	(0.048)
Borrowing Autonomy Index	0.001	(0.012)	-0.003	(0.011)
Δ Grants/ Subnational Revenue	-0.162	(0.121)		
(Δ Grants/ Subnational Revenue) \times (<i>High</i> Borr. Aut) \times (<i>Federal</i>)			-0.453	(0.205)**
(Δ Grants/ Subnational Revenue) \times (<i>High</i> Borr. Aut) \times (<i>Local</i>)			-0.739	(0.235)***
(Δ Grants/ Subnational Revenue) \times (<i>Low</i> Borr. Aut) \times (<i>Federal</i>)			0.220	(0.164)
(Δ Grants/ Subnational Revenue) \times (<i>Low</i> Borr. Aut) \times (<i>Local</i>)			-0.089	(0.135)
Δ Subnational Revenue/Total Govt. Rev.	-0.521	(0.173)***	-0.451	(0.156)***
Δ Population (log)	-1.089	(0.987)	-0.942	(0.865)
Log Area	0.012	(0.006)**	0.012	(0.006)*
Δ GDP per capita (log)	0.018	(0.122)	0.003	(0.126)
Δ Dependency Ratio	-1.511	(2.083)	-0.422	(2.283)
Δ Population Density	0.0002	(0.0001)	0.0002	(0.0001)
System (Pres/Parl)	-0.041	(0.021)*	-0.039	(0.019)**
Index of Political Cohesion	0.009	(0.004)**	0.009	(0.004)**
Constant	-0.107	(0.061)	-0.095	(0.067)
Observations	209		209	
Number of Groups	29		29	

Robust standard errors in parentheses

*significant at 10%; **significant at significant 5%; ***significant at 1%

Estimates for fixed unit effects not reported.

Calculated using Stata 7.0, "xtabond" procedure, one step results

Summary of Results

Fiscal decentralization and political federalism may indeed complicate macroeconomic management, but their effects are contingent on other institutional factors. The empirical analysis shows that it is useful to look beyond the rather frustrating and simple binary distinction between federal and unitary systems that has characterized recent literature. Intergovernmental fiscal systems and hierarchical rules are among the important building blocks in a more nuanced approach to the "varieties of federalism."

First of all, the results lend no support to the simple proposition that higher levels of transfer-dependence

are associated with larger or faster-growing deficits (H1). Rather, it is clear that higher-level governments can assuage the intergovernmental moral hazard problem by cutting off the access of subnational governments to credit. The cross-section models show that indeed, at higher levels of vertical fiscal imbalance, central governments attempt to restrict subnational borrowing (H2). The cross-section models predict relatively small deficits among subnational governments that either (a) face relatively strict formal borrowing limitations, or (b) are relatively fiscally independent, while the largest long-term deficits (subnational and total) are found when subnational governments are simultaneously transfer-dependent and free to borrow (H3). Similarly, growing transfer-dependence over time is associated with larger

deficits only when subnational governments are free to borrow.

The role of federalism is somewhat more complicated. Federated units display neither larger nor faster-growing deficits than local governments (H5). However, they do have significantly higher levels of borrowing autonomy (H4)—so much so that it is difficult to differentiate between the effect of borrowing autonomy and federalism. Though the degrees of freedom are low, the cross-section analysis does suggest that the conditional relationship between borrowing autonomy and transfer-dependence holds up among both federated units and local governments. Moreover, the panel data results show very clearly that when free to borrow, growing transfer-dependence has a negative effect on subnational fiscal performance both among federated units and local governments. But H6 posits that the negative effect of transfer-dependence will be more pronounced among federated units. Here the results of the long-term averages and dynamic analysis are discordant, but understandably so. The largest *long-term* subnational deficits are found among federated units with relatively high levels of vertical fiscal imbalance, though the marginal effect of increasing transfer-dependence is larger among local governments.

Implications and Conclusions

From a policy perspective, these empirical results are hard to ignore. The combination of wide-ranging subnational borrowing autonomy and growing transfer-dependence is increasingly common, especially as countries decentralize expenditures by ramping up intergovernmental transfers rather than building up the local tax base. In most cases, increases in transfers do not keep pace with increases in mandated subnational responsibilities. Unfortunately this has been the route to fiscal decentralization in much of the developing world. This danger may be particularly severe in large formal federations, where the center faces practical and constitutional challenges when trying to limit the spending and borrowing activities of the constituent units.

The results point out not only the path to persistent subnational deficits, but also a couple of distinct paths to long-term fiscal discipline. In the lower half of Figure 1, central governments attempt to cut off local access to credit. An important finding is that these prohibitions seem to work—long-term subnational deficits are negligible in such systems, and short-term fluctuations in grants have no effect on deficits. However, the data also show that this method of fiscal discipline is rarely in place among constituent units in large federations. It is

found primarily among local governments in small, homogeneous unitary systems, though interestingly, some troubled large federations like Brazil and India have recently introduced sweeping new legislation aimed at enhancing central control over subnational spending and borrowing.

Another path to fiscal discipline is found in the upper left-hand cell of Figure 1. Here, the central government limits its co-financing obligations, allows local governments to borrow, and leaves the enforcement of hard budget constraints up to self-interested voters and creditors. Indeed there is considerable evidence that this variety of fiscal discipline works well among governments occupying the upper left-hand corner like the U.S. states and Swiss Cantons (see, e.g., Lowry, Alt, and Ferree 1999; Bayoumi, Goldstein, and Woglom 1995; and Feld and Kirchgaessner 1999). One is tempted to conclude that the clearest goal for reform is to move toward this cell, increasing the tax base and revenue-raising capacity of subnational governments and reducing borrowing restrictions, sending a clear signal to voters and creditors that the center is resolute in its no-bailout pledge. Indeed the goal of increased local self-sufficiency seems attractive from many perspectives. But this can be extremely difficult, both as a normative and practical matter, especially in poor countries with weak or corrupt local government institutions and high levels of inequality.

Herein lays the dilemma of fiscal federalism and a more precise understanding of its dangers; for a variety of political and perhaps even moral reasons, the center often gets heavily involved in the affairs of the subnational governments—so involved that it cannot credibly commit to ignore their problems. At the same time, the center can be politically too weak, fragmented, or even beholden to certain subnational governments to censure them or change the basic fiscal and political institutions that create bad incentives. This is most often the case in federations with strong, disproportionate territorial representation, but by no means is the phenomenon limited to formal federations.

This article suggests several paths for future research. Future studies might do more to distinguish between the incentive effects of different types of intergovernmental grants, and collect better data about the tax autonomy of subnational governments.¹⁹ Perhaps using the typology in Figure 1 as a guide, more refined work can use disaggregated state- and local-level data to examine the incentive effects of different types of intergovernmental transfers and local taxes within countries. While I present a useful cross-national perspective, the precise role of intergovernmental transfers in shaping the perceptions and incentives of voters and politicians remains a notoriously

¹⁹For a good start, see OECD (1999).

open question in public economics (Oates 1991)—one that is not likely to be resolved with cross-country data.

Finally, although institutions clearly affect outcomes, an understanding of these effects does not translate easily into prescriptions for reform. It is necessary to make the key independent variables in this study endogenous—

especially vertical fiscal imbalance—in order to understand more clearly the political economy of institutional evolution and reform. An important goal for future studies of federalism is a richer understanding of the way in which fiscal and political institutions co-evolve, and the conditions under which reform is possible.

APPENDIX A Years and Sources

Case	Years	Grant Information	Borrowing Autonomy Index	Borrowing Autonomy Sources
Argentina state	1986–1996	IMF, IDB	4	IMF, IDB
Australia local	1986–1996	IMF	2.1	IMF
Australia state	1986–1996	IMF	2.6	IMF
Austria local	1986–1995	Bird 1986	1.35	IMF, Bird 1986
Austria state	1986–1996	Bird 1986	1.85	IMF, Bird 1986
Bolivia	1987–1995	IMF, IDB	1.5	IMF, IDB
Botswana	1990–1994	Segodi 1995	1	Segodi 1995
Brazil local	1986–1993	IMF, IDB, Shah 1994	3	IMF, IDB, Shah 1994
Brazil state	1986–1994	IMF, IDB, Shah 1994	5	IMF, IDB, Shah 1994
Bulgaria	1988–1996	IMF	1	IMF
Canada local	1986–1994	IMF, Courchene 1994	1.4	IMF, Kitchen & McMillan 1986
Canada state	1986–1995	IMF, Courchene 1994	3.25	IMF
Chile	1986–1988	IDB	1	IDB
Colombia	1985–1986	IMF, IDB	3	IDB
Denmark	1986–1993	GFS, Harloff 1988, Bury & Skovsgaard 1988	1.45	IMF
Finland	1986–1995	GFS, Harloff 1988; Nurminen 1989	3	IMF
France	1986–1996	GFS, Guilbert & Guengant 1989	3	IMF
Germany local	1986–1994	IMF	1.7	IMF
German state	1986–1995	IMF	2.675	IMF
Guatemala	1990–1994	GFS, IDB	2	IDB
India	1986–1994	IMF	2.5	IMF
Ireland	1986–1994	GFS, Harloff 1988	1.75	IMF
Israel	1986–1994	Hecht 1988	2.4	Hecht 1988
Italy	1986–1989, 95–6	GFS, IMF	2.5	IMF
Mexico local	1986–1994	IMF	2	IMF
Mexico state	1986–1994	IMF, IDB	2.8	IMF, IDB
Netherlands	1987–1996	GFS, Blaas & Dostal 1989, Harloff 1988	2.3	IMF
Norway	1986–1995	GFS, Harloff 1988, Rattso 2000	1.6	IMF
Paraguay	1986–1993	IDB	2	IMF, IDB
Peru	1990–1996	IDB	2.5	IMF, IDB
Philippines	1986–1992	GFS, Padilla 1993	1	Padilla 1993
Poland	1994–1996	Cielecka & Gibson 1995	2	Cielecka & Gibson 1995
Portugal	1987–1995	GFS, Harloff 1987	2.5	IMF
Spain local	1986–1994	Newton 1997	2.2	IMF, Newton 1997
Spain state	1986–1995	Newton 1997	2.8	IMF, Newton 1997
Sweden	1986–1996	GFS, Harloff 1988	3	IMF
Switzerland local	1990–1995	IMF	3	IMF
Switzerland state	1990–1996	IMF	3	IMF
UK	1986–1995	GFS, IMF	1.5	IMF
US local	1988–1995	IMF	3	IMF
US state	1988–1996	IMF	3	IMF
Zimbabwe	1986–1991	Helmsing 1991	1	Helmsing 1991

GFS: Government Finance Statistics Yearbook

IMF: Teresa Ter-Minassian, ed., *Fiscal Federalism in Theory and Practice*, 1997, International Monetary Fund.

IDB: Inter-American Development Bank, *Latin America after a Decade of Reforms*, 1997 Report.

APPENDIX B Construction of Borrowing Autonomy Index

This index is constructed based on the method developed by the Inter-American Development Bank (see IADB 1997: 188). It is built according to the following criteria:

- (1) *Ability to Borrow:*
If the subnational government cannot borrow, 2 points.
- (2) *Authorization:*
This number ranges from zero to one. If all borrowing by the subnational government requires central government approval (or state government approval for local governments in federal systems), 1 point. If no subnational borrowing requires approval, zero points. If the authorization constraint only applies to certain kinds of debt, or if the approval requirement is not always enforced, a score between one and zero is given according to the level of constraint.
- (3) *Borrowing Constraints:*
If there are numerical constraints on borrowing, such as maximum debt service/revenue ratios, up to .5 points, according to the coverage of the constraints.
- (4) *Limits on the Use of Debt:*
If debt may not be used for current expenditures, .5 points.

The value of the first part of the index (criteria 1 through 4) is equal to 2 minus the sum of the points from criteria (1) through (4). For example, if subnational governments in a country cannot borrow, the total for this part will be $2 - 2 = 0$.

Additional criteria are:

- (5) *Subnational Government Banks:*
If subnational governments own banks, 1 point. If these banks have substantial importance, an additional .5 points. If subnational governments have special relationships with banks, but do not actually own them (as in the German *Länder*), .5 points.
- (6) *Public Enterprises:*
If subnational governments own important public enterprises, and these have liberal borrowing practices, .5 points.

To obtain the final index for each country, the scores from criteria (5) and (6) are added to the first part of the index. One is added so that the final index varies between 1 and 5.

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