The Institutions of Fiscal Federalism

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Federal and decentralized political systems vary in the extent to which sub-central governments enjoy policy authority, political independence from the center, and taxation powers. The institutionalist view of fiscal federalism holds that sub-central governments' fiscal powers are meaningful and self-enforcing only when the central government cannot undermine regional authority. Most recent empirical research on fiscal federalism has ignored the institutional foundations of the system, with adverse consequences for measurement and interpretation. A new, institutional measure of fiscal federalism is proposed. Cross-national tests using this measure for thirty-nine democracies find that more fiscally federal countries, especially those with many competing jurisdictions, have smaller government consumption and government share of gross domestic product, while expenditure decentralization increases government size, findings consistent with widely accepted institutionalist theories.

Political scientists and economists alike have long studied the effects of fiscal federalism on economic growth, government spending and debt, and inequality in theory and in practice. The recent increase in attention to the observed mechanics of fiscal federalism is welcome, particularly since the subject has much to contribute to long-running debates on questions such as the sources of ''American exceptionalism'' on welfare policies and the politics of national budget-setting. However, attempts to test the theory of fiscal federalism have generally run aground on conceptual and measurement problems. Statistical operationalizations of fiscal federalism have conflicted with the conception of the system in the theoretical literature and have yielded non-sensical results.

The remainder of this article is laid out in four sections. The first section stipulates a definition of fiscal federalism as a specific configuration of political institutions. This understanding of fiscal federalism underlies the major theoretical predictions in the literature about the political and economic consequences of the system. The second section contrasts different types of institutional decentralization in consolidated democracies and shows how using only fiscal indicators to measure fiscal federalism yields misleading results. Instead, we need to develop institutional measures of regional economic self-rule, a task that the third section takes up. The fourth section shows that regional economic self-rule and number of competing

jurisdictions together explain variation in fiscal size of government for thirty-nine democratic countries from 1950 to 2005 in a manner consistent with established theory. The fifth section concludes and sketches an institutionalist approach to other research questions on fiscal federalism and related concepts.

Fiscal Federalism in Theory

Fiscal federalism has been defined and measured in various ways, but following Riker (1964, 11), Weingast (1995, 4), and Rodden (2004), we can identify the following elements of the ideal type:

1. Sub-central governments (SCGs) enjoy *programmatic autonomy*, i.e. exclusive authority to decide a subset of economic policy (creating, repealing, and adjusting programs and regulations).
2. SCGs face a *hard budget constraint*, funding their own spending largely out of autonomous revenues, i.e. revenues raised through taxes over which the SCGs enjoy the authority to set rates, base, or both, and may not have access to unlimited credit.
3. There is a *common market*, so that SCGs may not enact barriers to the free flow of goods, capital, and labor across their borders.
4. The system is *institutionalized*, so that the central government may not alter it at will.

Fiscal federalism as defined here does not necessarily include the ability of SCGs to participate in central government decision-making. This aspect of federalism could be thought of as ''shared rule'' as opposed to mere ''self-rule'' (Hooghe, Marks, and Schakel 2008a, 123).

The classic economic arguments both for and against fiscal federalism explicitly or implicitly rely on the foregoing formulation of the system. Charles Tiebout (1956) developed a stylized model of ''sorting'' across jurisdictions. The model predicts that with easy mobility and a large number of jurisdictions, individuals will move to those jurisdictions with public goods and tax levels more to their liking. In the limit, the level of public goods provision ends up being exactly efficient in every jurisdiction. Centralization inhibits this process by reducing the diversity of public goods provision by location and by increasing mobility costs across jurisdictions, since one might have to emigrate altogether to find a mix of public goods more to one's liking (Oates 1999). For the Tiebout model to work, it must assume a system satisfying all the elements of our definition: programmatic autonomy (so that public goods levels can differ across jurisdictions), hard budget constraints (so that jurisdictions cannot externalize the costs of providing public goods), a common market (so that individuals can freely move across borders), and institutionalization (so that the competencies of the jurisdictions can be treated as

exogenous in the model: politics can be safely ignored, as it is in the Tiebout model, only if the political system is assumed to be exogenous, i.e. perfectly self-enforcing).

Weingast's (1995) "market-preserving federalism" research agenda, which draws on earlier work by Hayek (1939 [1948]) and Brennan and Buchanan (1980), provides another argument in favor of fiscal federalism. Under market-preserving federalism, citizens flee jurisdictions that levy higher taxes and regulations than necessary to provide the public goods that citizens want. To avoid losing their tax base, governments must rein in their predatory activities, thus reducing rent-seeking and market distortions and promoting economic development. Weingast and collaborators have paid particular attention to the conditions under which decentralization is self-enforcing. For instance, Qian and Weingast (1997) argue that China's policy of permitting anonymous bank accounts prevented the central government from discovering or punishing tax evasion and made it possible for managers of local state-owned enterprises to capture the full revenue stream generated by their business activities without fear of future reprisal or expropriation.

According to Weingast (1995, 4), the four elements outlined above together comprise market-preserving federalism. In this model, the problem with centralization is that it reduces the proportion of economic policy-making that is made by governments subject to a strict competitive constraint. Presumably, free international flows of labor, capital, and goods could make national governments themselves subject to the zero-rents constraint, but the costs of emigration will probably ensure that most central governments enjoy significantly more autonomy to enact inefficient policies than do SCGs. Accordingly, transferring fiscal and regulatory authority from sub-central to central governments will increase rents and reduce economic growth in Weingast's theory.

Rodden (2003) develops a similar "Leviathan" model of fiscal federalism with similar predictions with respect to government spending. In Rodden's model, capital is more mobile across jurisdictions than is labor, capital prefers the lowest tax rate, and the local rate of growth depends on investment. Therefore, under fiscal federalism jurisdictions compete for capital on the basis of low tax rates, and centralized systems will have higher spending and taxation than decentralized systems. The difference with Weingast's theory is that Rodden does not necessarily predict that fiscal federalism reduces rents and increases economic growth. Indeed, Cai and Treisman (2004) introduce the possibility that regional governments may help capitalists evade central regulations and find that interjurisdictional competition for capital under fiscal federalism can itself be a kind of rent-seeking that reduces welfare.

Both supporters and skeptics of fiscal federalism thus share a common approach to modeling the system and a common expectation that fiscal federalism reduces

the fiscal size of government. The next section explores how actual federal regimes measure up to the ideal type.

Fiscal Federalism in Practice

No political system perfectly fulfills the four criteria for fiscal federalism, just as no democracy lives up to the majority rule ideal in every instance (Dahl 1956). This article focuses on decentralization in consolidated democracies, understood here as democratic systems in which politics is largely delimited by formal institutions as specified in constitutions and/or legal interpretation, rather than being conducted principally through the exercise of informal power. In such systems, we can identify three continuous dimensions on which decentralized systems can approximate or deviate from the fiscally federal ideal type, assuming that a common market has been realized. Each dimension corresponds to one of the criteria defining fiscal federalism.

The first criterion is programmatic autonomy of the SCGs. At one end of the spectrum, SCGs may have only minor policy responsibilities, while at the other end; they may have full internal autonomy, delegating only certain aspects of foreign affairs, monetary policy, and the common market to higher-level authorities. The second criterion is fiscal autonomy, the ability of SCGs to raise and keep their own tax revenues. At one end of the spectrum, SCGs may control both base and rate of virtually any kind of tax or fee they may wish to levy, while at the other extreme, central governments may restrict SCG funding to certain types of own-source taxes or to centrally distributed grants only. The final criterion is the institutionalization of the system. Democracies differ in the extent to which SCGs enjoy *legislative* as opposed to merely *administrative* autonomy. In the former scenario, SCGs enjoy constitutional protection and may legislate without fear of being vetoed by the central government. In the latter, SCGs may make policy only within the remit given them by the central government of the day, which can alter or abolish lower-level governments' responsibilities at will. Another aspect of institutionalization is the political autonomy of SCGs. In consolidated democracies, appointment of SCG officials by the center renders the SCG officials agents of the central government. Qian and Weingast (1997) argue that in China the ease of tax evasion gave local officials considerable room to maneuver despite the Communist Party's hierarchical structure, but such remedies are usually unavailable in systems in which formal institutions effectively structure principal-agent relationships. In democracies, allowing regional voters to elect their own representatives strengthens effective sub-central autonomy.

Assuming that SCGs enjoy political and legislative autonomy, we can plot institutional decentralization in consolidated democracies on two dimensions: programmatic and fiscal autonomy (figure 1). At higher levels on both dimensions, a system more closely approximates the fiscal federalism ideal type. High
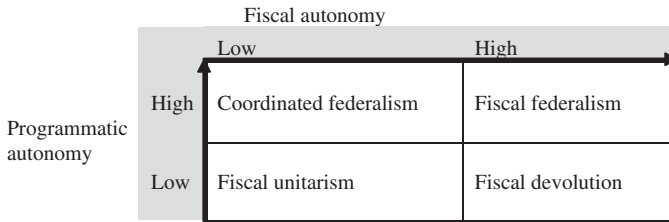
Figure 1 Typology of programmatic and fiscal autonomy.

programmatic autonomy with low fiscal autonomy characterizes ''coordinated federalism,'' represented by contemporary Germany and Austria, in which the regional governments rely mostly on central grants or automatic revenue-sharing to fund their programs (Adamovich and Hosp 2003). Coordinated federalism is often supplemented by regional co-decision on central fiscal policy, which has been linked to bailout expectations and problems in macroeconomic adjustment (Scharpf 1988; Braun, Bullinger and Wälti 2002; Treisman 2007). Low programmatic autonomy with high fiscal autonomy characterizes ''fiscal devolution'', systems in which SCGs are expected to fund centrally mandated programs with locally generated tax revenues. The Scandinavian countries Denmark, Norway, and Sweden approximate this type of regime, with county governments providing certain centrally legislated health care and welfare state services with income taxes over which counties control rate but not base. Of course, SCGs in both coordinated-federal and fiscally devolved systems generally enjoy less autonomy on both programmatic and fiscal dimensions than do SCGs in the most decentralized fiscal federations: the United States, Canada, and Switzerland.

Previous attempts to test theories of fiscal federalism using quantitative methods have almost universally relied on fiscal policy indicators to proxy programmatic and fiscal decentralization. As it turns out, these indicators are not particularly good proxies even of these concepts, and they ignore the institutionalization criterion altogether.

Much of the early research used a measure from the IMF called ''fiscal decentralization.'' The IMF measure is simply SCG spending divided by total government spending. As Rodden (2004, 483) points out, this variable is not a suitable indicator of programmatic autonomy, let alone full-fledged fiscal federalism. Unitary Denmark is scored as more fiscally decentralized than the federal United States, despite the fact that the Danish government has devolved only minor policy responsibilities on the counties and municipalities, since many central government programs in Denmark are administered through the county and local governments.

Another approach has been to use indicators of political federalism. Wibbels (2000) finds that federal and semi-federal countries in the developing world have

more debt, deficits, and inflation than their unitary counterparts. However, federal developing countries typically fall short on the hard budget constraints criterion (Jones, Sanguinetti, and Tommasi 2000; Rodden 2002).[1]

Rodden (2003) tests one implication of the market-preserving federalism thesis, the argument that fiscal federalism reduces overall government spending. To improve on the IMF measure of fiscal decentralization, Rodden introduces a new variable: sub-central own-source revenues as a percentage of total government revenues (central and sub-central), where revenues are counted as ''own-source'' if they are raised by SCGs, even if they have no discretion over tax rate or base. He finds that fiscal decentralization in this sense is associated with lower government spending. When included in the same model, the IMF measure of decentralization correlates positively with size of government, implying that devolving spending authority on SCGs while funding their spending through transfers encourages growth in government spending.

As Rodden acknowledges (2003, 709–710), this measure of own-source revenue decentralization is not the correct variable to test the market-preserving federalism thesis, since it includes revenues automatically transferred to SCGs through revenue-sharing schemes, as well as mandated taxes over which SCGs have no discretion. If SCGs have no discretion over tax rates, they cannot compete with each other for taxpayers on this basis. For this reason, he uses a fixed-effects error correction model, under the assumption that within-country diachronic change in the variable reflects largely changes in truly autonomous taxation powers. The statistical model takes the following form:

$$\Delta\text{LOG GOVERNMENT SIZE}_{it} =$$

$$\beta_0 + \beta_1 \text{LOG GOVERNMENT SIZE}_{it-1} + \beta_2 \Delta\text{LOG}\left(\frac{\text{GRANTS}}{\text{TOTAL REVENUE}_{it}}\right) +$$

$$\beta_3 \text{LOG}\left(\frac{\text{GRANTS}}{\text{TOTAL REVENUE}_{it-1}}\right) +$$

$$\beta_4 \Delta\text{LOG}\left(\frac{\text{OWN SOURCE SUBNAT.REV.}}{\text{TOTAL REVENUE}_{it}}\right) +$$

$$\beta_5 \text{LOG}\left(\frac{\text{OWN SOURCE SUBNAT.REV.}}{\text{TOTAL REVENUE}_{it-1}}\right) + \sum \text{CONTROLS} +$$

$$\sum \text{COUNTRY DUMMIES} + \varepsilon \qquad (1)$$

The dependent variable is a change variable, and the model includes fixed effects, so that the model is predicting yearly changes in government spending that are larger than average for each country, controlling for pre-existing government spending. In countries like the United States, Canada, and Australia, there have been no major, recent changes in the programmatic autonomy of the SCGs, and

the yearly changes that the model is predicting have mostly to do with the business cycle and federal tax policy. The finding that an above-average score for tax decentralization in a year reduces government spending more than average the next year presumably just reflects the fact that when central governments decide to cut taxes, they often have to cut spending as well. This result would have nothing to do with the logic of sub-central tax competition. Rodden's result might depend on true changes in programmatic autonomy in other countries, but it is impossible to know for certain.

As an improvement on Rodden's data, Stegarescu (2005) presents the results of a massive undertaking in data collection, including a measure of autonomous sub-central (tax) revenues as a percentage of total government (tax) revenues (excluding social security revenues and taxes paid to the EU) for 23 Organisation for Economic Co-operation and Development (OECD) countries for the years 1965–2001.[2] Still, these variables are not good proxies of subcentral policy autonomy. Even on the basis of the narrowest conception of sub-central tax decentralization, Sweden is reported as the third most decentralized country in the OECD, more decentralized even than the United States. Japan is fourth. Highly centralized countries Denmark and Finland appear more decentralized than federal Belgium and Australia. The broader measures of tax decentralization are even worse.

Despite its problems, the Stegarescu dataset has been widely used in substantive research. Fiva (2006) uses it to test the market-preserving federalism hypothesis for eighteen OECD countries. Consistently with Rodden (2003), he finds that tax revenue decentralization decreases the size of the public sector, while expenditure decentralization increases the size of the public sector. The former effect is driven by a reduction in social security transfers. This finding should give us pause, since no country has decentralized social security policy. Both market-preserving and privileged-capital models of fiscal federalism predict economies in SCG programs. Education, transportation, natural resources, and administration are all areas in which we should find that fiscal federalism reduces the size of government, but not social security or defense spending. Fiva (2006, 270–271) acknowledges puzzlement at these results.

Clearly, the tax decentralization variables are not generating sensible results. The central problem is that these measures take no account of unfunded or partially funded mandates on SCGs. In Denmark and Sweden, health care policy is administered through the counties (since 2007, the Danish counties have been replaced by a smaller number of regions and their taxing authority removed) (Hooghe, Marks, and Schakel 2008b). The national health services are expensive programs, but they are partly funded by local taxes rather than central government grants. County governments have no autonomy over health care policy; they have no choice but to fund these programs, although they enjoy some autonomy in setting

local income tax rates. In Sweden, county councils are directly elected, but county governors are appointed by the central government. Accordingly, the Swedish counties lack both the programmatic and full political autonomy characteristic of federal or even semi-federal states. Japanese prefectures enjoy more political autonomy than the Swedish and Danish counties, but nearly a quarter of their funding derives from matching grants from the central government (Hooghe, Marks, and Schakel 2008b). Matching grants, being tied to specific programs, encourage self-funded spending by SCGs that also cannot be considered truly autonomous, because SCGs face the loss of central grants if they cut their own spending.[3]

The data on tax decentralization are also flawed in the choice of denominator, total government tax revenues. Tax decentralization measured in this way might be a reasonable approximation of sub-central tax-raising powers (but not fiscal federalism) across countries, but it is inappropriate for time-series analysis, as Stegarescu (2005, 20) acknowledges. The business cycle causes fluctuations in the tax decentralization variable that are not due to changes in the distribution of competencies. For instance, if property tax revenues are less sensitive to the business cycle than are income tax revenues, and local governments depend principally on property taxes, while the central government depends more on income taxes, then tax decentralization will appear to increase during recessions and decrease during expansions.

This is not all. When the central government cuts tax rates, tax decentralization appears to increase, even when local programmatic autonomy decreases or remains static. This could happen if the central government continued to fund its programs through debt rather than current tax revenues. Figure 2 shows the tax decentralization data for the United States from 2001 to 2006.[4] Because of federal tax cuts, this appears to be a time of significant decentralization in the United States, despite the fact that expert observers consider this period to have been marked by the expansion of federal economic power at the expense of the states (Conlan and Dinan 2007).

Other empirical results that use Stegarescu's data are similarly suspect, such as Thornton's (2007) lack of a finding on the effect of tax decentralization on economic growth and Lessmann's (2009) finding that tax decentralization reduces regional inequality. If we want to test hypotheses about the effects of mobility and interjurisdictional competition on growth, government size, and regional inequality, we need to go back to the drawing board and devise a measure of fiscal federalism that comports more accurately with the theoretical ideal type. If we merely want to test the effects of bailout expectations on government debt, then the existing measure of vertical fiscal imbalance is perfectly valid (interjurisdictional grants as a percentage of total expenditure) (Rodden 2002). But this is merely one element of fiscal federalism.[5]
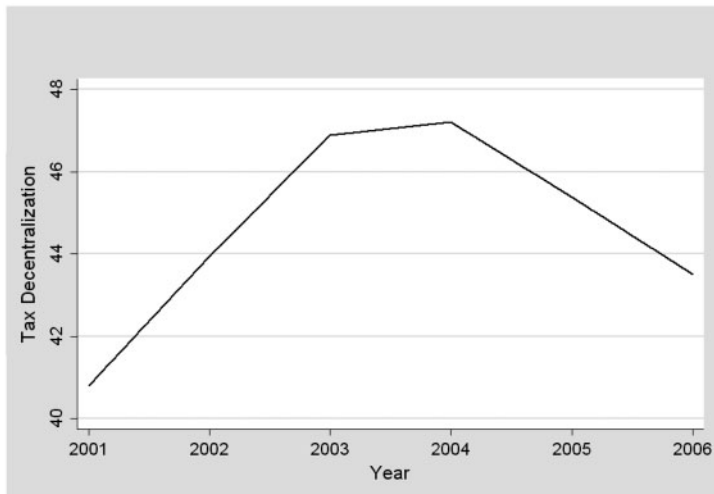
Figure 2 Tax revenue decentralization in the U.S. 2001–2006.

Fiscal Federalism as Local Economic Self-Rule

To test the classic theories of fiscal federalism, we need a measure that takes into account all four elements of the system: programmatic autonomy in economic affairs, dependence on autonomous revenue rather than grants, common market, and institutionalization. This section proposes an indicator of fiscal federalism, understood as regional economic self-rule, for consolidated democracies, taking into consideration the programmatic, political, and fiscal autonomy of SCGs and assuming the common market criterion to be largely satisfied.[6]

Until recently, cross-national measures of programmatic autonomy were unavailable. Early studies used a simple federal versus non-federal dummy variable, which ignores the important variation in regional powers within federal and non-federal systems. Schneider (2003) conducts confirmatory factor analysis to winnow down six indicators of decentralization to three dimensions of decentralization for the year 1996; however, the fiscal decentralization dimension is simply based on the problematic expenditure and revenue decentralization variables already mentioned. Arzaghi and Henderson (2005) provide an index of institutional autonomy for sixteen countries from 1960 to 1995, awarding points for the election of local officials, the revenue-sharing and revenue-raising authority of local governments, and the inability of the central government to suspend or veto local decisions. It is not fully suitable for our purposes, since it does not measure the scope of policy responsibilities of SCGs, and since revenue-sharing

should not count as a move toward fiscal federalism. Brancati (2006) measures
political decentralization and shared rule on a six-point scale for forty countries
for the years 1985–2000, awarding a point for sub-central elections, sub-central
control over tax authority, education, and police, and a point for sub-central
veto over constitutional amendments. The final item could be excluded from
a fiscal federalism measure, while the others would need to be combined with
measures of tax-raising powers from other sources to create a fiscal federalism
variable.

The most comprehensive coding of regional authority covers forty-two
(forty-three if West Germany is counted separately from unified Germany)
OECD and European countries annually for the 1950–2006 period (Hooghe,
Marks, and Schakel 2008c). The project measures regions (conceived as sub-central
jurisdictions with an average population of at least 150,000, thus excluding the
most local levels of governance) on indicators of both ''self-rule'' and ''shared
rule''. For purposes of measuring fiscal federalism, the shared rule indicators, which
code the regional role in central governance, can be ignored.[7] The self-rule
indicators are institutional depth (central government veto power) (ranging from
0 to 3), policy scope (existence of authoritative competencies in key policies) (0–4),
fiscal autonomy (regional control of major and minor tax rates and bases) (0–4),
and representation (whether regional officials are elected or appointed by the
center) (0–4). The Data Appendix (available in the online Supplementary Data)
provides details on how these variables are coded. The researchers simply add
scores on each of these indicators to create an overall measure of regional self-rule,
but as argued below, these authority characteristics are interdependent in a
complex manner that merely summing them does not capture. One limitation
of this dataset as a way of measuring decentralization is that it ignores the
subregional, municipal level. However, in most countries regional governments
have more authority than municipal governments (New Zealand is an exception),
and those countries that lack regional governments altogether are highly centralized
by any measure (e.g. Iceland, Luxembourg, the Baltic republics). Factor analysis of
various decentralization indices, including those mentioned above, reportedly
shows even the simple summed self-rule indicator to be as reliable as previous
measures of decentralization (Schakel 2008).

The regional self-rule variables can be used to create an index of fiscal federalism
that takes into account scope of economic policy autonomy, tax-raising powers,
and institutionalization. Since fiscal autonomy means little without policy and
political autonomy (if central governments can appoint regional officials, then they
will simply adopt the agenda of the central government), and since policy and
political autonomy cannot properly be called ''fiscal federalism'' without fiscal
autonomy, the logical strategy is to multiply the three indicators together: policy
scope, fiscal autonomy, and representation.

As a result, any system that completely lacks any of these three characteristics is scored ''zero'' because it does not constitute fiscal federalism. If the three variables are all positive, then fiscal federalism becomes an ordinal scale.[8]

However, the ''policy scope'' variable includes one policy area that has little to do with economic policy: immigration and citizenship. Regions with such powers, all of which also enjoy extensive economic policy powers, score the highest possible, ''4,'' on the variable. Prior to creating a scale of fiscal federalism, all ''4'' codes on policy scope are recoded as ''3''. The highest possible score on fiscal federalism is therefore 48 : 3 on ''policy scope'' times 4 on ''representation'' times 4 on ''fiscal autonomy.'' This scale can then be weighted according to whether the central government has veto power over regional decisions, information contained in the institutional depth variable.

The institutional depth variable is scored ''0'' if there is no functioning general-purpose administration at the regional level, in which case all the other variables are also zero; ''1'' if there is a deconcentrated, general-purpose, regional administration (i.e. regional administrations are mere central government outposts), in which case the representation variable is zero; ''2'' if regions have non-deconcentrated, general-purpose administrations that are subject to central government veto; and ''3'' if regions have non-deconcentrated, general-purpose administrations that are not subject to central government veto.

For the fiscal federalism variable developed here, the autonomy scale is multiplied by 0.5 if the central government maintains a veto over regional policies. While in theory a central government veto could utterly vitiate regional autonomy, political realities probably render explicit veto power less potent than the ability to appoint officials. If the central government can appoint regional officials, they can exercise informal pressure behind the scenes, but revoking regional laws, especially those passed by an elected assembly, invites overt political conflict that politicians would rather avoid. I have tried various other weights for veto power, from 0.5 to 1.0 (no penalty), but they do not notably change the statistical results presented here.

Country-level fiscal federalism scores are created as a population proportion-weighted average of the regional fiscal federalism scores. Some countries allow more autonomy for some regions than others, and some countries have multiple regional layers. To deal with the latter problem, the regional level with the highest fiscal federalism score is used.[9]

Table 1 shows the ranking of thirty-nine democracies on fiscal federalism, their scores on the component indicators, and the number of fiscally self-governing SCGs in each country in 2006.[10]

This ranking seems to pass the test of face validity much better than the Stegarescu ''autonomous tax decentralization'' and Rodden ''own-source revenue decentralization'' measures. Canada and Switzerland appear to be the most fiscally federal countries in this dataset in 2006. Countries also vary substantially in the

Table 1 Fiscal Federalism Rankings, 2006

Country	Policy scope	Fiscal autonomy	Representation	Cent. gov. veto?	Fiscal federalism/units
Canada	3	4	4	N	48/12
Switzerland	3	4	4	N	48/26
USA	3	4	4	N (DC: Y)	47.952/51
Spain	3	3 (Navarre, Euskadi: 4)	4	N	36.756/19
Belgium	3	3	4	N	36/3
Italy	3	3	4	N	36/21
Austria	3	2	4	N	24/9
Germany	3	2	4	N	24/16
Australia	3	2	4	N (N.T., A.C.T.: Y)	23.688/8
Denmark	2	3	3	Y	9/16
Norway	2	3	3	Y	9/19
Sweden	2	3	3	Y	9/21
Japan	2	2	4	Y	8/47
UK	2 (Scotland: 3)	1 (Scotland: 3)	4	Y (Scotland: N)	6.88/82
Croatia	2	1	4	Y	4/21
Hungary	2	1	4	Y	4/20
New Zealand	1	2	4	Y	4/14
France	2	1	3	Y	3/96
Netherlands	2	1	3	Y	3/12
Portugal	0 (Azores, Madeira: 2)	0 (Azores, Madeira: 3)	1 (Azores, Madeira: 4)	Y (Azores, Madeira: N)	1.136/2
Finland	1 (Aaland: 3)	0 (Aaland: 3)	3 (Aaland: 4)	Y (Aaland: N)	0.18/1
Albania	0	0	1	Y	0/0
Bulgaria	0	0	0	Y	0/0
Cyprus	0	0	0	N/A	0/0
Czech Republic	1	0	4	Y	0/0
Estonia	0	0	0	N/A	0/0
Greece	2	0	4	Y	0/0
Iceland	0	0	0	N/A	0/0
Ireland	1	0	3	Y	0/0
Latvia	0	0	0	N/A	0/0
Lithuania	1	0	1	Y	0/0
Luxembourg	0	0	0	N/A	0/0
Macedonia	0	0	0	N/A	0/0
Malta	0	0	0	N/A	0/0
Poland	2	0	4	N/A	0/0
Romania	1	0	3	Y	0/0
Slovak Republic	1	0	3	Y	0/0
Slovenia	0	0	0	N/A	0/0

number of autonomous jurisdictions, from Finland's one autonomous region to France's 96. Tiebout's (1956) sorting model assumes an infinite variety of jurisdictions, while Weingast-style competition can only occur if regions do not collude, which oligopoly theory predicts is less likely when the number of actors is high.[11] Therefore, in the quantitative analysis to follow, the fiscal federalism scores will be interacted with the number of units at the regional level(s) used to generate the country scores, with the expectation that fiscal federalism will have stronger effects the larger the number of units competing with each other. Since one expects declining marginal effect from each additional jurisdiction, the number of jurisdictions will be logged.

Following the two countries at the top is the United States, which falls just behind due to the District of Columbia's being subject to congressional oversight. Then come three recently federalized countries: Spain, Belgium, and Italy. They are followed by three older, fiscally consolidated federations: Australia, Austria, and Germany. A raft of ''regionalized'' but non-federal countries follows. Portugal and Finland just avoid being scored with the non-fiscally-federal countries at the bottom because of the special autonomy they accord their island regions. The mean fiscal federalism score is 11.0, the median is 1.5, and the standard deviation is 16.3, reflecting a left-skewed distribution. Figure 3 shows the evolution of fiscal federalism from 1950 to 2006 for those 21 countries coded for the entire period.
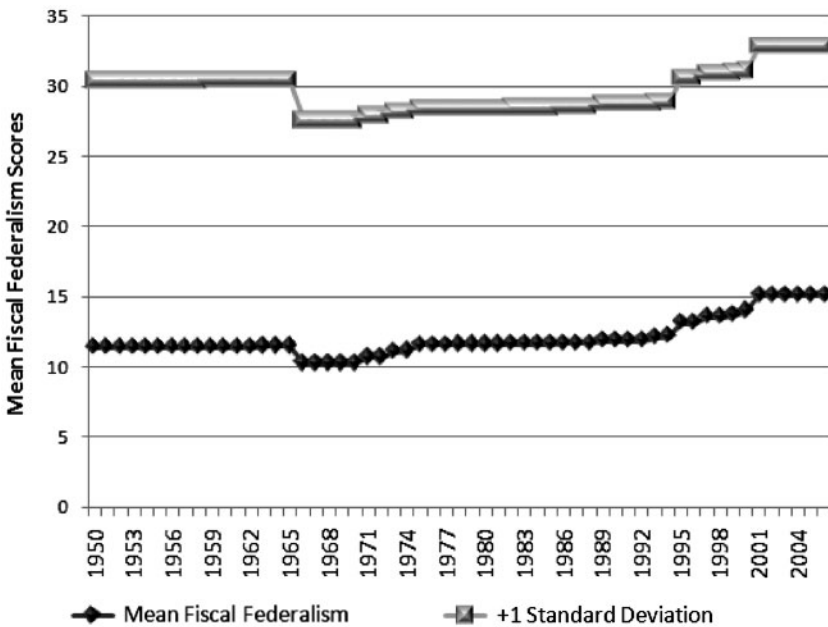

Figure 3 Evolution of Fiscal Federation, 21 Democratics.

   Despite widely documented, sizeable expenditure decentralization over this period (Rodden 2004), true fiscal federalism has changed much more modestly, as central governments have been reluctant to devolve significant economic policy autonomy to regions.[12]

   As discussed above, this measure of fiscal federalism does not take into account central government policy activity and thus may not serve well as a time-series indicator. To improve on the ordinal policy autonomy measure employed here, one could devise a measure of programmatic autonomy based on continuous fiscal data. The formula for this proposed measure is

$$\text{Fiscal Autonomy} = \left(\frac{\text{Autonomous SCG expenditure/Total SCG expenditure}}{\text{SCG} + \text{central governament expenditure}} \right) \times \text{Autonomous SCG tax revenue}$$

(2)

where ''autonomous SCG expenditure'' refers to SCGs' spending on programs controlled and initiated by the SCGs themselves, excluding both funded and unfunded mandates. The formula takes that portion of autonomous SCG tax revenue that goes to autonomous SCG programs and divides it by total government expenditure, the final number thus taking into account both the budget constraint faced by SCGs and their programmatic autonomy. If one assumed that regulatory activism would be fully reflected in the fiscal data, then it would only remain to take into account the effective political autonomy of the SCGs and common market provisions in order to have a reasonable indicator of institutionalized fiscal federalism. Unfortunately, coding which SCG programs are autonomously determined and which are centrally mandated would be an intensive exercise requiring detailed research into the legislation of each country in the dataset.

Empirical Analysis: Fiscal Federalism and Size of Government

In this section I perform a validity check on the indicator of regional economic self-rule, by analyzing its effects on total government expenditure across countries and over time.[13] I test what Rodden calls the ''Leviathan hypothesis'' and what Weingast refers to as ''market-preserving federalism''. Theory suggests that tax competition among economically autonomous jurisdictions will restrain government taxation and expenditure in those jurisdictions. The dependent variables used here are total government share of gross domestic product (GDP) (consumption plus investment, transfers excluded) and government consumption alone as a percentage of GDP. Government consumption measures spending on current operations and is dominated by the government wage bill. It is the usual indicator of the economic ''footprint'' of government (e.g. Garrett 1998; Rodrik 1998; Barro

2000). Government investment, which comprises expenditure on capital goods (such as structures, equipment, and software), may be either less or more productive than government consumption, depending on whether it complements or crowds out private investment. In Weingast's theory, fiscal federalism should increase government consumption and investment on positive-marginal-benefit projects and programs and decrease unproductive spending. Rodden's mobile-capital model implies a more straightforward negative correlation between fiscal federalism and size of government.

> Hypothesis 1: Fiscal federalism reduces government share of GDP.
> Hypothesis 2: Fiscal federalism reduces government consumption share of GDP.

Government share of GDP is available from the Penn World Table 6.2 (PWT) for the years 1950–2004. General government consumption as a percentage of GDP is available from the World Bank's World Development Indicators (WDI) for 1960–2005. Both variables are measured on a 0–100 percentage scale.

The key independent variables are country-level fiscal federalism (population-weighted regional economic self-rule scores), the logged number of regional jurisdictions for each country,[14] and an interaction between the two. Fiscal federalism is expected to exert strongest downward pressure on size of government when the number of jurisdictions is high. To capture the "flypaper effect" as well as bailout expectations, the IMF's expenditure decentralization variable is also employed, following the strategy of Rodden (2003). However, it is only available for years after 1972, and then only for some countries, so it is excluded from some regressions. It is expected to be positively related to government spending. A fiscal codecision measure is created (see Data Appendix in the Supplementary Data) to ensure that the effects captured by the empirical models reflect decentralization rather than the correlated but distinct concept of subcentral representation in central fiscal policy-making institutions.

A number of control variables are also included in the regressions. The first is GDP per capita, to account for Wagner's Law. In the regressions reported here, Purchasing Power Parities (PPP) per capita in thousands of 2,000 international dollars is taken from PWT, which has these data for more years than does WDI. I have also tried using the WDI data, with no essential difference in results. The GDP variable is also first differenced to create a GDP growth variable and account for the fact that size of government increases during recessions.

Finally, control variables for post-socialist transitions are created. Countries just coming out of socialism should have bigger governments, all else equal, but that difference should decay with time. The construction of the three post-transition variables is described in the Data Appendix (Supplementary Data).

Several other control variables were also tried, but they do not materially improve model fit or affect coefficient estimates on the key variables and therefore

are not reported here: country population (logged), trade (exports plus imports divided by GDP), a dummy variable for European Union members, a dummy variable for majoritarian, single-member-district electoral systems, and decade dummies.

The figure in the Data Appendix (Supplementary Data) shows that government spending was more unpredictable in the early 1990s in post-transition countries, and that government spending clustered much more closely around the predicted level in the 2000s in these same countries. This is an example of the phenomenon of contemporaneous, panel-wise heteroskedasticity in time-series cross-section (TSCS) data. Beck and Katz (1995) recommend an adjustment to standard errors in ordinary least squares regressions, ''panel-corrected standard errors,'' that the regressions in this paper use. To correct for serial correlation in the error term, a lagged dependent variable is included.[15] The coefficients on the independent variables thus reflect the effect of a one-unit increase in the independent variable on *change* in government size the next year. Asymptotic long-run effects of each independent variable can be calculated as $\beta/(1 - \alpha)$, where α is the coefficient on the lagged dependent variable.

Table 2 presents the results of the four regressions without expenditure decentralization. The first regression has government share of GDP as the dependent variable, and covers the years 1950–2004. The second regression adds to the first the number of jurisdictions and its interaction with fiscal federalism. The third regression uses government consumption share of GDP as the dependent variable and covers the years 1960–2004, while the fourth adds the two additional terms. Table 3 gives marginal effects and significance tests for the interacted variables from regressions two and four at different values of the companion variable.

As the marginal effects table shows, fiscal federalism's downward pressure on government consumption is larger and more certain when the number of jurisdictions is large, but the number of jurisdictions is statistically significant at high values of fiscal federalism only in the government consumption regression. The substantive importance of fiscal federalism is also more apparent when government consumption is the dependent variable. Since government share of GDP includes both government consumption and investment, we can infer that fiscal federalism definitely depresses government consumption but has less effect, if any, on government investment. From the third regression, the estimated long-term effect of a one-unit increase in fiscal federalism on government consumption is 0.17 percentage points of GDP. A twenty-point increase in fiscal federalism, such as that experienced by Italy between 1992 and 1997, would in the long run reduce government consumption by 3.3 percentage points of GDP. A forty-point increase in fiscal federalism, such as a move from New Zealand's 2004 score (7.2) to Switzerland's 2004 score (48), would reduce government consumption by about six

Table 2 Fiscal federalism and size of government

| Dependent variable: | Government share of GDP 1950–2004 | Government share of GDP 1950–2004 | Government consumption 1960–2004 | Government consumption 1960–2004 |
| Years covered: | | | | |
Variable	Coeff. (Std. Err.)	Coeff. (Std. Err.)	Coeff. (Std. Err.)	Coeff. (Std. Err.)
Fiscal federalism	−0.0056 (0.0016)***	−0.0013 (0.0026)	−0.0059 (0.0014)***	0.0029 (0.0035)
Jurisdictions		−0.017 (0.019)		−0.017 (0.017)
FF * Jurisdictions		−0.0012 (0.0012)		−0.0027 (0.0012)*
Real GDP per capita	0.013 (0.004)**	0.014 (0.004)***	0.014 (0.005)**	0.015 (0.005)**
Δ RGDPPC	−0.735 (0.056)***	−0.739 (0.057)***	−0.598 (0.056)***	−0.604 (0.056)***
Transition variable 1	106.5 (34.5)**	106.7 (34.5)**	102.7 (33.4)**	102.2 (33.4)**
Transition variable 2	−102.0 (33.7)**	−102.1 (33.6)**	−98.6 (32.5)**	−98.1 (32.5)**
Transition variable 3	58.8 (16.8)***	58.8 (16.8)***	54.3 (16.4)***	54.0 (16.4)***
Lagged dep. var.	0.964 (0.007)***	0.965 (0.008)***	0.965 (0.009)***	0.964 (0.009)***
Constant	−3.8 (1.1)***	−3.8 (1.1)***	−3.3 (1.1)**	−3.3 (1.1)**
R^2	97.8%	97.8%	96.8%	96.9%
N (countries)	1363 (39)	1363 (39)	1105 (38)	1105 (38)

Ordinary least squares regressions with panel-corrected standard errors. t-tests two-tailed. $^*P<0.05$ $^{**}P<0.01$ $^{***}P<0.001$.

Table 3 Marginal effects of fiscal federalism and number of jurisdictions

Variable	Testing point	Regression 2 Marginal effect	Regression 4 Marginal effect
Fiscal federalism	Median of "Jurisdictions" (9)	−0.0041**	−0.0034*
	Mean of "Jurisdictions" (19.8)	−0.0050**	−0.0053***
	90th percentile of "Jurisdictions" (51)	−0.0061*	−0.0078***
Jurisdictions	Median of "Fiscal federalism" (1.5)	−0.0188	−0.0214
	Mean of "Fiscal federalism" (11)	−0.0303	−0.0470***
	90th percentile of "Fiscal federalism" (47.9)	−0.0753	−0.1469**

Marginal effects are for a one-unit increase in fiscal federalism and a one-log-unit increase in jurisdictions, respectively. Long-run effects may be obtained by multiplying each by 28.

and a half percentage points of GDP, or just slightly more than the actual difference between New Zealand and Switzerland in 2004 (17.8 and 11.9 percent, respectively). This estimated effect is larger than that of a $10,000 difference in GDP per capita. Finally, fiscal federalism seems to explain most of the difference in size of government between the United States and most of Europe. If the United States were fully fiscally centralized, its predicted long-run government consumption would be 7.9 percent of GDP higher, which would give the United States a government roughly the size of the Netherlands' (24 percent government consumption share of GDP).[16] The United States is not an outlier, however, and dropping it does not materially affect the results.

These results strengthen when expenditure decentralization and fiscal codecision are added (table 4). Expenditure decentralization is positive and highly statistically significant, as expected. In testing at critical values, fiscal federalism is statistically significant and negative at all critical values of jurisdiction number, while jurisdiction number is statistically significant and negative at medium and high levels of fiscal federalism. Fiscal codecision is statistically significant and negative, apparently supporting the veto-players argument about the fiscal consequences of such institutions (Freitag and Vatter 2008) over the expectations of common-pool theories (Scharpf 1988). Figure 4 graphs the conditional relationship between fiscal federalism and number of competing jurisdictions on government consumption, using the results from the model with fiscal codecision.

Other robustness checks attempted include dropping economic growth as a possibly endogenous variable, dropping all unitary countries with special autonomous regions, using dummy variables for different levels of fiscal federalism, and logging fiscal federalism. None of these changes affected the findings on fiscal federalism, number of jurisdictions, or expenditure decentralization.

Table 4 Effects of fiscal federalism and expenditure decentralization on government size

Dependent variable:	Governmentconsumption	Government consumption
Years covered:	1972–2004	1972–2004
Variable	**Coeff. (Std. Err.)**	**Coeff. (Std. Err.)**
Fiscal federalism	−0.0028 (0.0036)	0.0031 (0.0050)
Jurisdictions	−0.042 (0.026)	−0.040 (0.026)
FF * Jurisdictions	−0.0026 (0.0014)	−0.0042 (0.0017)*
Expenditure decent.	0.0078 (0.0021)***	0.0074 (0.0021)***
Fiscal codecision		−0.023 (0.011)*
Real GDP per capita	0.017 (0.006)**	0.018 (0.006)**
Transition variable 1	172.5 (42.8)***	172.4 (42.8)***
Transition variable 2	−165.9 (41.6)***	−165.8 (41.5)***
Transition variable 3	91.0 (21.3)***	91.0 (21.4)***
Lagged dep. var.	0.961 (0.010)***	0.961 (0.011)***
Constant	−5.9 (1.4)***	−5.9 (1.4)***
R^2	96.6%	96.6%
N (countries)	839 (37)	839 (37)

See notes to Table 2.

Variable	Testing point	Marginal effect
Fiscal federalism	Median of "Jurisdictions" (9)	−0.0088***
	Mean of "Jurisdictions" (19.8)	−0.0107***
	90th percentile of "Jurisdictions" (51)	−0.0131***
Jurisdictions	Median of "Fiscal federalism" (1.5)	−0.0459
	Mean of "Fiscal federalism" (11)	−0.0705***
	90th percentile of "Fiscal federalism" (47.9)	−0.1665***

See notes to Table 3. Long-run effects may be obtained by multiplying each by 26.

The findings comport with one of the predictions of the "Leviathan" model, that fiscal federalism reduces government spending when the number of competing jurisdictions is large enough. Since scholars broadly endorse this theorized relationship regardless of normative judgments about fiscal federalism, these findings validate the institutional approach to theorizing and measuring fiscal federalism. While previous work using state-of-the-art data on autonomous tax decentralization (Fiva 2006) has only found that decentralization reduces social security transfers, which is likely a spurious finding, we now have robust evidence that institutionalized fiscal federalism, more broadly conceived, reduces the proportion of the economy dedicated to the ongoing activities of government, as well-accepted theory predicts. Theory also helps us to understand why fiscal federalism might not reduce government investment, if mobile factors view
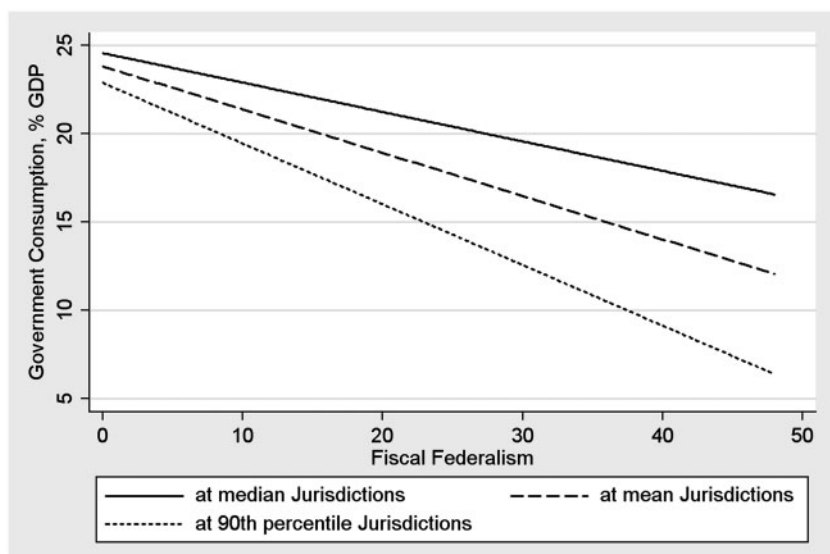
Figure 4 Long run asymptomatic effects plotted. All other independent variables held at their means.

government investment, especially in infrastructure, as largely providing complementarity with their own production.

Conclusion

The central contention of this article is that previous empirical work using spending or revenue decentralization as proxies for fiscal federalism has ignored the political context of fiscal federalism, especially the programmatic and political autonomy (institutionalization) of the sub-central jurisdictions. Existing measures of fiscal decentralization do not correlate well with a more robust operationalization of fiscal federalism. Guidelines for future attempts to measure fiscal federalism have been developed, along with a proposed variable that foregoes some precision for greater accuracy. As a validity check, government consumption and government share of GDP have been regressed on the proposed measure of fiscal federalism for thirty-nine democracies, with the expected results obtaining. Fiscal federalism reduces government consumption share significantly over time, with somewhat weaker effects on government GDP share, and these relationships are stronger when the number of competing subcentral jurisdictions is higher.

While the proposed fiscal federalism measure is imperfect, it is a vast improvement over prior variables. For the first time, we have the tools to test market-preserving federalism, fiscal codecision, and fiscal commons theories

simultaneously in cross-national statistical models. A final point worthy of note is that fiscal federalism is here treated as a distinct concept from inter-regional redistribution. The most highly fiscally federal countries in this article, Canada and Switzerland, both undertake substantial equalization programs to ensure that low-income regions do not fall behind high-income regions. The causes and consequences of equalization programs under different federal arrangements comprise an important research agenda for the future (Rodden 2008). Future empirical research on the effects of fiscal federalism on size of government, economic growth, and regional inequalities should forego prior fiscal decentralization measures and use broader indicators, such as this one, that take into account all elements of the system as conceived in political-economic theory.

Supplementary Data

Supplementary data can be found at www.publius.oxfordjournals.org.

Notes

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1. Some developing countries also fail to guarantee a common market, allowing regional governments to regulate immigration and transport from other regions, as Indonesia has done (Goodpaster and Ray 2000).
2. Governments receive some revenue from non-tax sources, such as interest and rental income, fees, fines, and privatization proceeds. Stegarescu (2005) therefore reports both total revenue and tax revenue figures.
3. Federal grants to states that are tied to specific programs are also common in the United States, but they are less important as a source of subnational revenue than they are in Japan.
4. State and local autonomous tax revenue comes from the Census Bureau, while federal revenue figures come from the Office of Management and Budget. Social security and retirement receipts are excluded.
5. Schneider (2003) considers this measure to reflect administrative decentralization.
6. This assumption makes sense for consolidated democracies but not for systems in which informal barriers to inter-regional commerce are significant.
7. It could be argued that regional representation in the central governments contributes to federalism's institutionalization, but this is a hypothesis that would have to be tested rather than assumed.
8. The most significant limitation of the policy autonomy indicator is that it does not take into account central government activism within the remit of the SCGs. If the central

government sets a high fiscal or regulatory baseline, then SCGs have little room to experiment with different policies even if they enjoy nominal autonomy. For instance, the growth of the central government in the United States over the nineteenth and twentieth centuries entailed a corresponding decline in the effective autonomy of state governments, because they could no longer choose to have, say, a different kind of Social Security system, a lower-than-federal minimum wage, or a different antitrust policy, even though the states' formal competencies remained the same. Existing fiscal decentralization measures do try to take this factor into account by explicitly examining the share of sub-central fiscal activity in total government revenue or expenditure.

9. In the most complex case, the UK as of 2006, the Welsh and Northern Irish assemblies are scored as lacking any fiscal autonomy, since they do not have tax-varying powers, while Scotland is scored 36 (policy scope = 3, fiscal autonomy = 3, representation = 4, institutional depth = 3). Non-Scottish Britain is scored according to the counties' level of responsibility, since they do have minor taxation powers. The overall score for the UK is the Scottish fiscal federalism score times the proportion of the British population living in Scotland plus the rest-of-Britain fiscal federalism score times the proportion of the British population living outside Scotland (36*0.09 + 7.2*0.91 = 9.8).

10. Only country-years scoring ''8'' or better on the Polity IV index of democracy minus autocracy are included in this analysis.

11. Stansel (2006) has found that higher numbers of competing local jurisdictions in U.S. metropolitan areas is associated with lower local government spending.

12. The major changes have been federalization in Belgium (1989–1995) and Italy (1993–2001) and the establishment of the autonomous communities in Spain. Denmark, Norway, Sweden, and Japan are other notable but much more modest decentralizers. West Germany (1966) is the only major case of fiscal centralization.

13. A valid variable accurately captures the phenomenon it measures. One way of testing the validity of a proposed indicator is to examine its correlations with previously validated indicators of the same concept (e.g. factor analysis). In this case, I argue that previous measures of fiscal federalism are invalid. Therefore, a better test of validity than factor analysis with these previous measures is to examine whether the proposed measure more accurately predicts theoretically related phenomena.

14. One is added to number of jurisdictions before logging so that the function is defined.

15. An alternative model structure for TSCS data is some form of fixed effects, in which either country dummies are included or, to economize on degrees of freedom, all variables are de-meaned. This approach, used by Rodden (2003), is inappropriate for these data since the independent variable of interest, fiscal federalism, only infrequently changes. In fact, it never changes in some countries, which would need to be dropped from the regression if fixed effects were used. Instead, these models include a lagged dependent variable to account for the fact that last year's size of government affects this year's size of government.

16. Alesina and Glaeser (2006, 95) argue that federalism and other institutional features explain roughly half of the difference in ''level of redistribution'' between the United States and Europe.

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