Decentralization: Conceptualization and Measurement*

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Decentralized government institutions are doing more of the work of government than ever before, but there is little agreement about 1) what decentralization means, or 2) how it should be measured. To overcome this confusion, this article builds on standard definitions of decentralization that include three core dimensions: fiscal, administrative, and political. The article offers an empirical test of that definition using factor analysis of data from 1996 for sixty-eight countries. Factor analysis confirms these three core dimensions and generates a score for each case in each dimension, allowing countries to be measured according to their type and degree of decentralization. In future work, these scores can be used for hypothesis testing about the causes and effects of decentralization on important social outcomes. This exercise demonstrates that conceptual confusion need not hamper research when empirical tests can help verify conceptual categories.

Decentralized government institutions are doing more of the work of government than ever before. Recent research has responded to this development and deepened our understanding of decentralization and its links to outcomes such as growth, inequality, and political stability. Despite increased research, there remains a great deal of conceptual confusion. Researchers attach a startling diversity of definitions and measures to the decentralization concept. The availability of cross-national statistical data has only exacerbated this proliferation.

Some might consider this proliferation of measures and definitions as necessary to account for a wide variety of cases. Alternatively, others might consider, as this article does, that the proliferation of meanings and measures erodes precision and impedes our ability to assess types of decentralization. The prob-

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lem is worsened by the evaluative nature of the decentralization concept, which leads researchers to conflate decentralization with other concepts, especially those that are also imbued with positive value, such as democracy or market reforms. The result is that there is little agreement about what constitutes an example of decentralization, what causes decentralization, or what effects it is likely to have.

To overcome this confusion, this article proposes and tests a definition of decentralization. Although there is disagreement about the meaning of decentralization, most would agree that transferring power and resources to national governments is not decentralization.[1] Nevertheless, all share the assumption that decentralization includes the transfer of power and resources away from the central government.

This article hypothesizes three core dimensions of the decentralization concept: fiscal, administrative, and political.[2] Fiscal decentralization refers to how much central governments cede fiscal impact to non-central government entities. Administrative decentralization refers to how much autonomy non-central government entities possess relative to central control. Finally, political decentralization refers to the degree to which central governments allow non-central government entities to undertake the political functions of governance, such as representation.

Decentralized systems are those in which central entities play a lesser role in any or all of these dimensions. In such systems, central governments possess a smaller share of fiscal resources, grant more administrative autonomy, and/or cede a higher degree of responsibility for political functions. Because decentralization is a relative concept, each dimension should be measured in terms of the central government proportion of the overall total. It is critical to examine each dimension, identifying the unique characteristics that set it apart from the other dimensions, and at the same time, recognizing that the dimensions may be tightly interrelated. Understanding the uniqueness of these dimensions requires also understanding their interaction.

This article proposes a measurable definition of decentralization and an empirical test of that definition. The test confirms that three core dimensions of decentralization are substantively different yet interrelated. The technique used to undertake this type of hypothesis test is confirmatory factor analysis of data from 1996 for sixty-eight countries (see Appendix 1). This technique tests the conceptual validity of the three dimensions, improves the accuracy of measures of each dimension, and studies the empirical relationships among them. Also, factor analysis generates a score for each case on each dimension, allowing countries to be measured according to their level of fiscal, administrative, and political decentralization. In future work, these scores can be used for hypothesis testing about the causes of different kinds of decentralization and the effects of degrees of decentralization on important social outcomes.

Contemporary Decentralization

The current fondness for decentralization began during the 1980s.[3] Stagnant economies and inefficient central bureaucracies led researchers to consider

decentralization as a solution to the problems of developing countries, and multilateral institutions began to include decentralization components in many of their programs.[4] There were domestic pressures for decentralization also, as local politicians and civil society actors sought to capture power from central governments, and national leaders granted access to central power and resources as a means of obtaining support from local allies or meeting demands for democratization. Ideological support came from both the right and the left, though for different reasons—the former to increase efficiency and the latter to effect a different distribution of power. Additionally, freer trade, international treaties, and loan conditions led central governments to choose, or be forced, to abdicate their traditional roles, and left critical functions to non-central government entities if they were to be performed at all.[5]

In short, subnational governments are now doing a larger share of the work of government in both developed and developing countries. As more and more countries move away from centralized government institutions, the concept of decentralization is studied in new contexts. Still, though many of these countries share characteristics of decentralization, there are stark differences in the kind and degree of decentralization that has occurred.

Conceptual Confusion in Decentralization Research

To their credit, researchers have tried to be careful about the way they define decentralization and the contexts in which they study it. Yet grappling with the difference in kinds and degrees of decentralization has produced a conceptual muddle. Researchers have multiplied the conceptualizations of decentralization; associated the various concepts with different meanings; imbued it with positive normative value; conflated it with other concepts; and ignored its multidimensionality. A survey of the voluminous literature on decentralization suggests that decentralization has been approached by a variety of intellectual traditions (Wallis 1991). Cohen and Peterson (1997: especially Annex I) note that disciplinary differences and even language differences have led to variations in the application of the concept.[6] By way of contrast, decentralization's antonym, centralization, has a much more precise and accepted usage, which is the concentration of power, resources, and authority in a single head or center.

Concepts with varied meanings do not necessarily present problems, but they require great care to avoid generating too many meanings (over-specification) or too few (under-specification) (Lakoff 1987). Either extreme produces conceptual muddle and causal uncertainty, in particular when researchers delimit the meanings and indicators to accord with their belief systems or assist in proving hypotheses.[7] This is especially problematic when the researchers' beliefs lead them to associate the concept with normative values, as in the case of the generally positive value associated with decentralization.

In many cases the original decentralization concept becomes simply conflated with other evaluative concepts. For example, much research has included democracy or market reforms in the definition of decentralization.[8] The problem,

of course, is that the relationship between decentralization and these other concepts is a causal hypothesis that must be empirically tested.

In an attempt to avoid confusion, researchers use alternate terms that do not carry normative implications; for example, multi-level government, de-centered governance, multiple centers of government, dispersed government, etc. However, this strategy does not eliminate the underlying problem, which is how to define and measure the concept. As a result researchers often end up talking past one another. For example, using different definitions can introduce different measures of decentralization in the same case.[9] Researchers can also create confusion by focusing on different levels of analysis; some study decentralization by examining local-level institutions while others examine national averages. Those attempting to draw implications from the research, such as policymakers, cannot help but be confused.

This article suggests that some of the conceptual and causal tangle can be undone by distinguishing among the multiple dimensions of decentralization. If there are multiple dimensions, then decentralization along one dimension could be related to one set of causes and effects, and decentralization along another dimension could relate to a different or opposite set of causes and effects. Alternatively, decentralization along one dimension could interact or combine with decentralization along another dimension (to produce outcomes). Researchers who do not explicitly look at each dimension or haphazardly aggregate dimensions will mismeasure the type and degree of decentralization and draw incorrect inferences about the relationship between decentralization and other phenomena. To disentangle these relationships it is necessary to conceptualize the dimensions separately and theorize their interactions. To test the accuracy of the model, the article will develop measures for each dimension and test the measurement model against the actual distribution of cases. Only then can we identify examples of decentralization, more or less, and begin to undertake causal analysis.[10]

Conceptualizing and Measuring the Decentralization Concept

The current approach differs from prior approaches by hypothesizing a conceptual model for the decentralization concept and then offering an empirical test of that model. The most common conceptualizations of decentralization in the literature have concentrated on those institutions *receiving* power or resources.[11] In contrast, this article will measure the dimensions of decentralization in terms of the degree to which power and resources are taken away *from* central governments. All forms of decentralization, regardless of the recipient, involve shifting power and resources away from the central government.

This article builds on applications of the decentralization concept in theories of fiscal federalism, public administration, and political science. Each of these theories highlights a dimension of decentralization, which are treated as distinct and separable. In addition, the current approach suggests that empirical tests of cross-national data will both measure decentralization and confirm a model of the concept that consists of three distinct dimensions. Before proceeding to the statistical test, it is worthwhile to discuss the conceptual frame-

work that underlies the measurement model and the indicators that will be used.

Fiscal Federalism

Fiscal federalism theories dealing with decentralization focus on maximizing social welfare, which is portrayed as a combination of economic stability, allocative efficiency, and distributive equity. The precise combination and importance attached to each goal depends on the context, but the challenge of decentralization is essentially to locate resources at the level of government that optimizes social welfare (Musgrave 1958: 132-33, 175-178).

It is important to determine the degree to which each level of government has fiscal impact (Oates 1972: 17). To what degree do the resources handled by each level of government have an impact on these outcomes? If resources have been ceded to subnational units, then central governments have, to one degree or another, less fiscal impact. One of the ways in which fiscal impact is evident is in looking at collateral for credit. Governments that handle large amounts of resources, whether those resources are tied to expenditures or not, are able to draw on credit resources.

Expenditures and revenues form the two main components of fiscal activity.[12] Central to any system of public finance, they comprise the total amount of money that governments put into or take out of an economy as well as where governments put the money and where they take it from. The current study hypothesizes that the best indicator for the level of fiscal centralization or decentralization is the share of subnational expenditures and revenues.

The choice of focusing on fiscal instruments rather than regulatory or financial policies is partly methodological and partly substantive. Governments use various instruments to influence the amount and distribution of wealth in society. Because regulatory instruments are built into the formal and informal institutions that govern civil society and private sector, they are extremely complex and context-specific. Financial instruments are similarly difficult to measure with statistics, and their impact on distribution is not as direct as fiscal policy. Fiscal policy offers the best window into levels of fiscal decentralization. Decentralization of regulatory or financial mechanisms will thus have to be taken up in individual country studies.

Despite being easier to measure, fiscal instruments still present some methodological difficulties. Though the IMF has attempted to standardize its definition of decentralization, it remains extremely difficult to attain accurate measurement using self-reported statistics.[13] What is measured as a local expenditure or revenue in one context may be scored as a nationally controlled resource in another.

Nevertheless, there are several advantages to focusing on revenues and expenditures. First, revenues and expenditures offer the best measures available without detailed study of each country. Second, by using both expenditures and revenues, we tap into the main aspects of fiscal decentralization. The key attribute of fiscal decentralization is the fiscal impact of subnational governments relative to the overall impact of government. This article hypothesizes

that subnational expenditures and revenues as a percentage of total expenditures and revenues provide useful measures of this concept. These indicators are related but not exactly the same, as empirical testing will show. Expenditures focus on the amount of government activity that governments undertake, and revenues focus on the quantity of resources that pass through them.

Expenditures constitute all cash outlays by a given level of government. They can be examined as a whole, over time, in terms of revenues, as a percentage of GDP, in distinct subsections, in subsections as a percentage of some other variable, in constant values, in current values, or as appears here, as a percentage of all government outlays. Each treatment offers a slightly different perspective on spending policy, but viewing subnational expenditures as a percentage of total expenditures is the most appropriate way to gauge fiscal decentralization.[14] There are some drawbacks to presenting expenditures as a percentage of total expenditures, as this measurement misses those expenditures that do not appear as cash outlays, such as credit guarantees, nor does it distinguish expenditures decided locally. Still, viewing subnational expenditures as a percentage of total expenditure focuses on fiscal impact exercised by lower governments as opposed to that exercised by central governments. A larger proportion of the expenditures spent by lower level governments indicates that fiscal impact has shifted away from the central government.

The revenue side of fiscal decentralization is composed of all cash inflows to subnational governments, including taxes, loans, and grants. As in the case of expenditures, these can be examined in a number of ways and with respect to other variables, and each treatment offers a different view of revenue policy. As with expenditures, the indicator chosen is subnational revenue as a percentage of total government revenue, which focuses on the fiscal revenues in the hands of subnational governments as opposed to those revenues in the hands of the center.[15] A larger proportion of revenues collected by subnational governments indicates that fiscal impact has shifted away from the central government.

Intentionally, this conceptualization has focused on the degree of centralization/decentralization of fiscal impact and does not evaluate the autonomy possessed by local units. Autonomy is the focus of the next category, administrative decentralization, which draws on theories of public administration.

Public Administration

Public administration theories dealing with decentralization broadly focus on how modern bureaucracies are achieved, which have been defined as efficient, effective, and rational (Weber 1968: esp. 926-39, 956-89). There is significant debate about whether these attributes operate in tandem or if there are trade-offs. The combination likely depends on individual cases. Administrative arguments focus on the administrative effects of granting local jurisdictions autonomy from central control. This autonomy is constituted by general policymaking authority and personnel control, as well as control over public finances (Rondinelli 1984).

The amount of administrative decentralization ranges in a continuum across

systems, from those characterized by a low degree of autonomy, to those with a high degree of autonomy. Previous literature has categorized administrative decentralization generally using three terms, most commonly labeled "deconcentration," "delegation," and "devolution" (see Rondinelli 1990).[16] The current approach to decentralization views these categories as nothing more than points along a continuum of administrative autonomy. Deconcentration involves the least amount of autonomy, delegation slightly more, and devolution the most. The following section discusses the categories used in the literature and makes the case for treating them within the continuum of administrative autonomy.

"Deconcentration" refers to a central government that disperses responsibility for a policy to its field offices. This transfer changes the spatial and geographical distribution of authority, but does not significantly change the autonomy of the entity that receives the authority. Under deconcentration arrangements, the central government retains authority over the field office, and exercises that authority through the hierarchical channels of the central government bureaucracy. Deconcentration allows only moderately more autonomy than centralized systems.

By contrast, "delegation" transfers policy responsibility to local governments or semiautonomous organizations that are not controlled by the central government but remain accountable to it. The main difference between deconcentration and delegation is that the central government exercises its control through a contractual relation that enforces accountability of local government. This represents a slightly higher level of administrative autonomy for local entities than under deconcentration.

Finally, under "devolution," the central government allows quasi-autonomous local units of government to exercise power and control over the transferred policy. Compared to the other two types of administrative decentralization, devolution provides the greatest degree of autonomy for the local unit. The local unit is only accountable to the central government insofar as the central government can impose its will by threatening to withhold resources or responsibility from the local unit.

What discriminates among these categories of administrative decentralization is the relationship between the central government and the entity that receives power and resources. Deconcentration involves a bureaucratic, hierarchical relationship; delegation involves a contractual relationship; and devolution involves an arm's-length relationship. The differences in kind among these relationships—between hierarchy, contract, or arm's length—constitute a syndrome of factors. The best way to summarize that syndrome is in paying attention to the degree of autonomy granted by the central government. Such a simplification perhaps misses some of the conceptual richness of the different relationships, but is sufficient for measuring the continuum of administrative autonomy.[17]

One way to measure levels of local administrative autonomy is by examining the control exercised over local revenue. The percentage of local revenues from taxes provides an indicator of the degree of subnational control over resources. Taxes are different from the total amount of resources, which is

more a measure of wealth rather than control. As mentioned before, subnational revenues are a combination of taxes, transfers, grants, and loans. Taxes offer the greatest degree of autonomy, grants, and loans offer somewhat less, and discretionary transfers probably the least. Transfers, even supposedly automatic ones, can be withheld, and grants and loans generally arrive with conditions or with expenditures earmarked.[18]

A second measure of subnational autonomy is the percentage of total grants and revenues not accounted for by transfers. This could conceivably include taxes, loans, fees, sales of assets, or informal contributions. There are some drawbacks to excluding all transfers, which do not distinguish for example between transfers over which lower levels of government have total control, such as block grants, and transfers that are tied to central government priorities, such as earmarked transfers, or transfers that require certain behaviors by subnational governments, such as matching or fiscal balance. Still, the treatment of all revenues aside from transfers gives an indication of the degree to which subnational governments raise their own funds through taxes, loans, fees, or sales of assets.

It is worth noting that this measure leaves out the political criterion associated with the devolution category of administrative decentralization. Under most definitions, devolution requires recipients of decentralization be democratically elected local bodies. Such a definition includes patterns of representation in the administrative dimension, which is meant to refer to degrees of autonomy. Representation deserves attention in its own right, however, as the core characteristic of the next dimension, political decentralization.

Political Decentralization

Political science theories dealing with decentralization focus on mobilization, organization, articulation, participation, contestation, and aggregation of interests. All political systems perform these processes, and the way in which they occur depends on individual contexts. Decentralized political systems are those in which political actors and issues are significant at the local level and are at least partially independent from those at the national level (Fox and Aranda 1996).

The best way to summarize these functions might be in terms of representation, which refers to the way political institutions "map the multiplicity of citizen interests onto policy decisions" (Litvack et al. 2000: 6). To have an impact on policy, interests in society must be mobilized, organized, and articulated through institutions that carry interests to the state (Berger 1983). Some systems of representation operate through civil society institutions, such as NGOs, social movements, or interest organizations. Other systems of representation, such as political parties, aim to bring interests directly into the official political apparatus through elections. Finally, some systems of representation bring interests into direct negotiation with the state bureaucracy, as in corporatist bargaining.[19] All systems of representation are bound by institutions of the state itself, which sets the rules for representation and thus shapes what issues get politicized and how. Under politically decentralized systems citizens define

interests and form identities on the basis of local concerns, and organizations such as parties and social movements operate locally and compete over local issues and in local elections.

In this article elections are held to be the most obvious indicator of representation occurring at different levels. During the electoral process, the electorate votes, the votes are aggregated, and politicians take power. Local elections indicate that some portion of representative activity is being undertaken at the local level, forcing parties to organize for local contests. Candidates must compete and make appeals to citizens in local jurisdictions. Citizens may organize and participate through non-electoral channels, but these are harder to characterize, and probably do not have as direct an impact on representation. Of course, the importance of local elections in the larger national picture can vary, but local elections at least increase the likelihood that some political functions will be decentralized.[20] The existence of elections at the municipal level or the state/provincial level is hypothesized here as an indicator of political decentralization.

Though there are other political functions, electoral components are the most valid indicators of political decentralization as they tap into fundamental aspects of political authority. Elections address the issue of representation, which is the primary way interests gain access to legislative and executive power.

Interrelations Among the Dimensions

The preceding discussion of approaches to decentralization outlines three dimensions for analysis: fiscal decentralization, administrative decentralization, and political decentralization. What has not yet been discussed, but remains pertinent, is the degree to which these dimensions are interrelated. This interrelationship can contribute to conceptual confusion, as decentralization along one dimension may influence or cross over into decentralization along another dimension. Without accounting for this interrelationship, measures will over- or underestimate the amount of decentralization.

First let us consider the range of possible ways that dimensions could interact. One possible pattern is that increasing decentralization in one dimension leads to an increase in decentralization in another dimension. A second pattern is that increasing decentralization in one dimension leads to a decrease in decentralization in another dimension. Three dimensions produce six different combinations.[21]

Without speculating too much, it makes sense to describe how a few of these interactions might operate. For example, fiscal decentralization might generate greater administrative decentralization if local units used increased resources to assert administrative autonomy from the center.[22] Alternatively, fiscal decentralization might lead to less administrative decentralization if central governments systematically counteracted the release of resources with an increase in bureaucratic or regulatory controls. Similar scenarios could be described for the relationships between each dimension.

Even if one accepts the argument that there are three unique and interrelated

dimensions to decentralization, empirical measurement and confirmation remains a difficult task. There are three questions to answer:

- First, to what degree can decentralization be understood in terms of fiscal decentralization, administrative decentralization, and political decentralization? In other words, do we really need all three dimensions, or alternatively, might there be others?
- Second, to what degree and in what ways are these dimensions related to one another?
- Third, is the measurement of decentralization dimensions sophisticated enough to produce a meaningful scale? Can we design a measure that validly and accurately allows us to order countries in terms of their relative amounts of decentralization?

Table 1 displays the dimensions proposed as central to the decentralization concept and the indicators that will be used to test the measurement model.

Table 1
Decentralization Dimensions and Indicators

Dimension	Indicator	Source
Fiscal Decentralization	Subnational expenditures as percentage of total expenditures	DecentralizationStatistics, World Bank Website, IMF Governement Finance Statistics
Fiscal Decentralization	Subnational revenues as percentage of total revenues	DecentralizationStatistics, World Bank Website, IMF Governement Finance Statistics
Administrative Decentralization	Taxation as a percentage of subnational grants and revenues	DecentralizationStatistics, World Bank Website, IMF Governement Finance Statistics
Administrative Decentralization	Transfers as a percentage of subnational grants and revenues	DecentralizationStatistics, World Bank Website, IMF Governement Finance Statistics
Political Decentralization	Municipal elections	Database of Political Institutions, Country Constitutions, Library of Congress Country Facts, CIA World Factbook
Political Decentralization	State elections	Database of Political Institutions, Country Constitutions, Library of Congress Country Facts, CIA World Factbook

Measurement Model

This article proposes a measurement model for decentralization, and endeavors to test that model. This task is challenging because the dimensions are

difficult to measure, and any metric for one dimension is likely to simultaneously pick up elements of the others. In part, this is because there are causal relationships among the dimensions (political decentralization may contribute to fiscal decentralization, etc.), but also because any quantitative measure is likely to be somewhat imprecise. No single indicator can capture the decentralization concept fully, and no simple combination of indicators, such as an average or an index, can capture the multidimensionality of the concept. What is to be done?

The model proposed here conceptualizes decentralization as three distinct but interrelated dimensions that can be measured using the six indicators described above. Factor analytic techniques applied to the indicators can calculate the unique and interrelated characteristics of the different dimensions of decentralization and test whether the model is accurate. This technique of proposing and testing a measurement model using factor analysis is known as confirmatory factor analysis, and it rests on the intuition that underlying concepts, such as the dimensions of decentralization, are manifest in empirically observed indicators.[23]

The specific hypotheses to be tested are 1) that decentralization consists of three abstract dimensions; and 2) each of the six indicators is closely related to one of the three dimensions. If the most statistically accurate grouping divides the indicators into three clusters according to shared characteristics, this analysis confirms that there are three underlying dimensions, as opposed to two or four (or some other number).[24] The largest factor coefficients should relate indicators to the dimension they are hypothesized to measure. For example, the largest factor coefficient of subnational percentage of expenditures should be the coefficient related to the fiscal decentralization dimension.

Each indicator will be related, at least slightly, to each dimension. Partly, this is because the measures are imperfect indicators of each dimension. In addition, the coefficients reflect the fact that the dimensions are related to each other. For example, politically decentralized systems might find local political weight used to allocate more resources to lower levels of government. As a result, part of the subnational revenues indicator should not be attributed to fiscal decentralization but reflects characteristics derived from the political decentralization dimension.

Factor analysis uses this information to improve measurement in ways that simple aggregation or indexes cannot. This analysis separates the impact of each dimension and calculates its size in the factor coefficients. We can use these relationships to calculate case scores on each dimension. The factor coefficient measures the intensity of the relationship between each variable and each dimension and can be multiplied by each case score for each variable. The sum of the coefficients times the case scores gives a factor score for each case in each dimension. In other words, the analysis produces a measure of fiscal decentralization, administrative decentralization, and political decentralization in each case. In fact, this measure is superior to other methods of measurement that do not take as many indicators into account and/or that do not attempt to separate the unique and shared characteristics of each indicator.[25]

Cases and Data

This article applied confirmatory factor analysis to decentralization data collected from sixty-eight countries in 1996. The data included fiscal indicators from IMF Government Finance Statistics, obtained from the World Bank website on decentralization, and filled in missing values with data from the 2001 IMF hardcopy publication where available. Other data were collected in the Database of Political Indicators collected by researchers at the World Bank and the Government of Switzerland. Missing political data was obtained from country constitutions, Library of Congress Country Facts, and the CIA Factbook.[26]

In cases in which there was no fiscal data available from 1996 but data from other years in the 1990s were available, linear trends obtained through regression analysis of available data filled the 1996 data. As most fiscal indicators are variables that change incrementally over time, if at all (expenditures, revenues, etc.), this practice was not likely to change the results. Interpolating the data across years provided more cases for analysis, though the results were unchanged by using data from a single year alone.

Special care was also taken in relation to indicators that were related to variables that might confound the analysis, such as the type of regime. This was particularly the case for the political decentralization indicators that focused on elections and electoral rules. Some non-democracies held elections and data was therefore available for the political decentralization indicators. Nevertheless, some might argue that the representation that occurs in non-democracies, however decentralized, is substantively different than that occurring in democracies. A local election in which the national government is authoritarian or in which only one party competes can hardly be called competitive, and probably does a poor job of decentralizing political functions. To address this issue, the analysis also examined only democratic cases, and no significant changes in results occurred.[27]

Factor Analysis

Confirmatory factor analysis was used to test the hypothesis that three dimensions of decentralization (fiscal, administrative, and political) underlay measurable indicators. The six indicators were: 1) subnational expenditures as a percentage of expenditures; 2) subnational revenues as a percentage of total revenue items; 3) the relative importance of tax as a percentage of subnational revenues; 4) the relative importance of transfers as a percentage of subnational revenues; 5) the existence of municipal elections; and 6) the existence of state or provincial elections. The hypothesis was that the first two indicators measured mostly fiscal decentralization; the third and fourth indicators measured administrative decentralization; and the last two indicators measured political decentralization.[28]

The number of cases with data available on all indicators was sixty-eight. Among these cases, the mean percentage of subnational expenditures as a percentage of total expenditures was 22.27 and the mean percentage of subnational revenues was 17.24. The mean percentage of subnational rev-

enues from taxes was 44.65 and the mean percentage from transfers was 34.60. Twelve of the cases had no municipal elections, and twenty-six had no state elections.
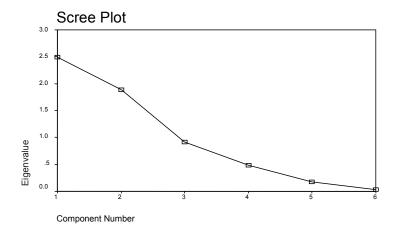
Principle factor analysis of the data confirmed the assertion that three dimensions most appropriately organized the data. The eigenvalue for the third dimension was statistically indistinguishable from one (.93), with a cumulative percent of variance explained of 88.29 percent (see Table 2).

Table 2
Eigenvalues

Factors	Initial Eigenvalue	Cumulative % of Variance Explained
1	2.50	41.63
2	1.89	73.10
3	.93	88.29
4	.49	96.47
5	.18	99.42
6	3.45E-02	100

A second test of the hypothesis that three dimensions underlie the data is a scree plot of the eigenvalues. If the plot appears to level off, it indicates that increasing the number of dimensions adds little marginal difference in the variance explained.[29] Indeed, in the current case, the scree plot appears to level off after the third dimension (see Diagram 1).

Diagram 1
Scree Plot

Next, the correlations among the variables were used to measure the relationship between variables and underlying dimensions.[30] Table 3 displays the factor coefficients and loadings for each indicator on each factor. As expected, subnational expenditures as a percentage of total expenditures and subnational revenues as a percentage of total revenues were highly correlated with each other, and with the "fiscal decentralization" dimension. The factor coefficient of subnational expenditures as a percentage of total revenues was .971 and the coefficient of subnational revenues as a percentage of total revenues was .930.

Also as expected, the relative importance of tax and transfer revenues as a percentage of subnational revenues were most highly correlated with each other and with the "administrative decentralization" dimension. The factor coefficient of tax revenues as a percentage of local revenues was .917 and the coefficient of non-transfer income as a percentage of local revenues was .931.

Finally, municipal elections and state elections were most closely related to each other and to the third dimension, which has been labeled "political decentralization." The factor coefficient of municipal elections was .930, and the factor coefficient of state elections was .712 (see Table 3).

Table 3
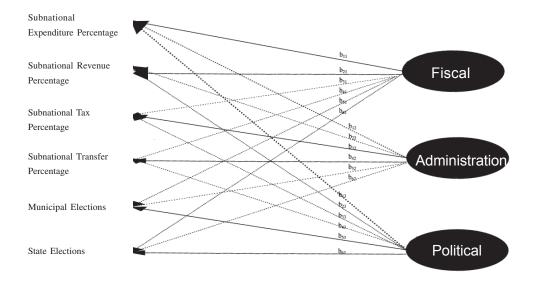**Decentralization Dimensions, Indicators, and Factor Coefficients**

	Fiscal Decentralization		Administrative Decentralization		Political Decentralization	
Subnational Expenditure Percentage	b_{11}	**.971**	B_{12}	.0387	b_{13}	.144
Subnational Revenue Percent	b_{21}	**.930**	B_{22}	.315	b_{23}	.0638
Subnational Tax Percentage	b_{31}	.251	B_{32}	**.917**	b_3	-.0277
Subnational Transfer Percentage	b_{41}	.0263	B_{42}	**.931**	b_{43}	-.140
Municipal Elections	b_{51}	-.0428	B_{52}	-.0282	b_{53}	**.930**
State Elections	b_{61}	.412	B_{62}	-.172	b_{63}	**.712**

Bold type indicates factor on which indicator loads most heavily.

Factor analysis also allows us to determine the degree to which the dimensions are related to one another. Given the nature of the decentralization concept, in which one kind of decentralization is expected to influence other kinds, correlation among the dimensions was expected. Nevertheless, the factor analysis showed that the correlation between the dimensions was relatively small and statistically insignificant. Between fiscal decentralization and administrative decentralization, the correlation coefficient was -.13. Between administrative decentralization and political decentralization the correlation coefficient was .11, and between fiscal decentralization and political decentralization the correlation coefficient was zero. None of the coefficients were statistically significant. Though this result was somewhat surprising, it supported the assumption that the dimensions could be analyzed as though they were orthogonal.
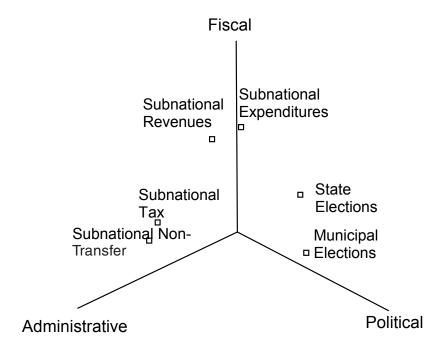
The graphical model in Diagram 2 displays the nature and intensity of the relationship between dimensions and variables. The three latent dimensions are the ovular items to the right. The five observed variables are the squares to the left. The intensity of the relationship between the variables and the dimensions is given by the factor coefficient, "b." The first subscript indicates the observed variable and the second subscript indicates the factor. For example, b_{11} refers to the relationship between the first variable (subnational expenditures as a percentage of total expenditures) and the first dimension (fiscal decentralization). In all, eighteen coefficients indicate the strength of the relationship between each of the six observed variables and each of the three abstract dimensions. The diagram provides a measurement model of the decentralization concept, in which three abstract dimensions are measured using six observable variables. Table 3 contains all factor coefficients.

Diagram 2
Measurement Model of Decentralization

A three-dimensional diagram offers a second way to display the intensity of the relationship between each indicator and the dimensions. In Diagram 3, the three abstract dimensions are displayed orthogonally, and the indicators are shown as points according to their factor coefficient. As one would expect, the fiscal decentralization indicators cluster together and extend farthest along the first dimension. The administrative decentralization variables also cluster together but extend farthest along the second dimension. Finally, the political-decentralization variables cluster together, farthest along the third dimension. For example, state elections mostly relate to political decentralization (factor coefficient of .712), but somewhat relate to fiscal decentralization (factor coefficient of .412) and administrative decentralization (factor coefficient of -.172). In the diagram, the state elections point is located at the coordinates (.712, .412, -.172). The diagram shows that the indicators largely measure one of the dimensions and can be clustered according to this principal component, but the effects of other dimensions also spill over into each indicator. This spill-over can be explained as a result of the fact that the dimensions are related to one another and also because the indicators are only imperfect measures of any single dimension.
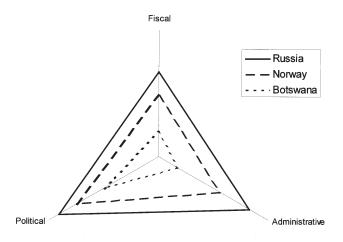
Diagram 3
Factor Coefficients in Three-Dimensional Space

Finally, the factor coefficients for each variable were used to obtain a score for each case along each dimension. For each case, the factor scores are the sum of the products of the factor coefficients and the indicator scores. For easier interpretation, factor scores were normalized to a zero-to-one scale, and can be read in terms of decentralization units. Thus, Albania has a score of .38 fiscal decentralization units, 0 administrative decentralization units, and .44 political decentralization units. Appendix 1 displays the factor score on each dimension for the different countries in the study. The average amount of fiscal decentralization, on a zero-to-one scale, was .42. The average amount of administrative decentralization was .54, and the average amount of political decentralization was .54.[31]
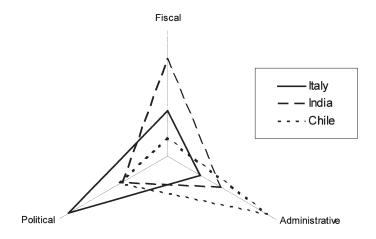
A number of patterns became evident in the factor scores. Some countries were high on all three dimensions (e.g., Russia), some were located in the middle on all three (e.g., Norway), and some were lower on all three (e.g., Botswana). Diagram 4 uses the factor scores to plot a "radar" diagram of decentralization. The three dimensions are displayed orthogonally, and the country factor scores are marked along each dimension. Plotting the high, medium, and low countries listed above gives a general idea of the amount of decentralization in each country.

Diagram 4
Radar Diagram of Decentralization in Low-Medium-High Countries

A different pattern emerges when one considers that some countries score high on one dimension and low on the others. Chile has a high amount of administrative decentralization and lower amount in all others. Italy, by contrast, has a high amount of political decentralization and a lower amount otherwise. Finally, India has a high amount of fiscal decentralization and a lower amount in all others. A second radar diagram displays this pattern for the three countries listed.

Diagram 5
Radar Diagram of Decentralization in Low-High-High
and High-Low-High Countries

We can test the face validity of these measures by comparing these scores with what we know from more qualitative research on decentralization. For example, the data from 1996 gave Argentina high scores on all three dimensions of decentralization (.70, .80, .90). Qualitative details offer nuances not picked up in the factor analysis, though they confirm the overall picture of Argentina as a decentralized federal system in 1996. For example, though not indicated in the factor analysis, Argentine subnational fiscal capacity was greatly enhanced by the ability to borrow. Restrictions on borrowing were largely administrative and could be decided with the agreement of local legislatures. Many local jurisdictions also had the luxury of taking loans from their own banks. On the other hand, international loans required central government approval, and all loans were restricted to investment or to restructuring.[32]

Administratively, subnational units enjoyed a great deal of autonomy in terms of the policies they pursued. Central government had little ability to withhold finances from subnational units as most transfers were an automatic percentage of domestic taxes, encoded by law, and distributed according to a predetermined formula or amount. For example, a portion of VAT and property tax were distributed to the provinces and municipalities according to the number of beneficiaries in the jurisdiction. Some of the transfers, though not all, were tied to specific expenditures, such as 50 percent of asset tax being earmarked for education. Still, provinces and local jurisdictions enjoyed significant autonomy with respect to the amount, structure, execution, and supervision of various social services, including housing and education (except university). The public-health system was controlled by the central government though hospitals were largely controlled by provinces. Politically, nomination and financing of candidates occurred at each level of government, and parties had internal factions that reflected bases of politicians in different prov-

inces. On the other hand, a relatively dominant president and party leader added a degree of political centralization not reflected in the factor analysis. Overall, the qualitative information on Argentina confirms what the factor analysis uncovered.

Did any countries score unexpectedly in the factor analysis? Netherlands Antilles is unusual , as it scored very high on fiscal decentralization, very high on administrative decentralization, and the lowest on political decentralization (.93, .93, 0). It is possible for a country to decentralize fiscally and administratively while retaining political functions at the center; still, this case demands closer examination. One explanation could be the small size of the Netherlands Antilles; decentralized political functions may simply not register with the indicators used. Indeed, the country is a strange one to characterize. It is a federation of five islands that are part of the Dutch Kingdom but autonomous in their internal affairs. The Dutch government manages defense and foreign affairs while the queen of the Netherlands remains the chief of state. She appoints a governor general who is the chief executive, and a parliament with twenty-two members selects a prime minister who carries out executive responsibilities. Each island has its own legislature, though the central government can overrule any council decision that it deems against the public interest. The odd scoring produced in the factor analysis may be attributable to the fact that the indicators used for political decentralization did not detect the unusual configuration of the individual island legislatures. The fiscal and administrative indicators, by contrast, did detect this particular structure. Fortunately, excluding Netherlands Antilles from the sample did not significantly change the ratio order of the other countries.[33]

Conclusions and Avenues for Future Research

The last two diagrams suggest an interesting direction for future research. If countries vary in their degree of decentralization, and if the amount of decentralization varies across dimensions within individual cases, then the unique, and sometimes independent causal importance of different kinds of decentralization can be measured and tested with new accuracy. Key research questions in the study of decentralization come into view. What causes countries to decentralize, and what causes them to decentralize along one dimension and not another? Further, what impact does decentralization have on important social outcomes such as participation, accountability, and redistribution? What are the impacts of different kinds of decentralization on these outcomes?

This article proposed a measurement model of decentralization based on three dimensions of decentralization. It tested and confirmed the model using data on six indicators collected from sixty-eight countries. The end result of this exercise is an improved measurement of decentralization that allows questions to be asked in a more rigorous analytic fashion. The article invites researchers to use the factor score dataset to test their own hypotheses about decentralization.

The article reminds us that systematic measurement of complex concepts requires great care. Increasingly, statistical indicators have become available,

but conceptual confusion clouds our understanding of how to use them. As a result, a multitude of hypotheses can emerge, and a multitude of definitions can be applied. To give order to our concepts, this article advances an explicitly empirical approach that uses conceptual categories to meaningfully organize observations. An empirical approach may not work for all concepts, especially those that defy neat categories and measurable indicators. In addition, techniques that depend on measuring variations, such as factor analysis, will work imperfectly if the real-world distribution of cases does not reflect the full range of a given concept. Still, where possible, empirical verification of social-science categories is extremely important. A mutually understood set of concepts can allow researchers to either agree or disagree in a productive fashion, and provide more consistent advice to policymakers.

Appendix 1

Factor Scores from Confirmatory Factor Analysis – Countries and Decentralization Dimensions

Country	Fiscal Decentralization	Administrative Decentralization	Political Decentralization
Albania	0.3	0	0.44
Argentina	0.7	0.8	0.9
Australia	0.75	0.42	0.57
Austria	0.6	0.59	0.62
Azerbaijan	0.53	0.61	0.05
Belarus	0.57	0.63	0.04
Belgium	0.3	0.41	0.67
Bolivia	0.44	0.46	0.58
Botswana	0.19	0.17	0.5
Brazil	0.64	0.55	0.88
Bulgaria	0.25	0.66	0.98
Canada	0.96	0.67	0.82
Chile	0.15	0.92	0.44
Croatia	0.32	0.75	0.26
Czech Rep.	0.43	0.52	0.49
Denmark	0.71	0.53	0.87
Dom. Rep.	0	0.67	0.68
Estonia	0.35	0.75	0.37
Fiji	0.14	0.77	0.14
Finland	0.61	0.62	0.29
France	0.29	0.63	0.8
FRG/German	0.66	0.64	0.88
Georgia	0.49	0.66	0.06
Guatemala	0.35	0.02	0.01

Hungary	0.34	0.38	0.59
Iceland	0.38	0.81	0.8
India	0.77	0.49	0.42
Indonesia	0.27	0.27	0.33
Ireland	0.4	0.12	0.87
Israel	0.31	0.45	0.5
Italy	0.36	0.3	0.91
Kazakhstan	0.51	0.83	0.51
Kenya	0.15	0.68	0.12
Kyrgyzstan	0.51	0.54	0.19
Latvia	0.43	0.75	0.35
Lithuania	0.48	0.74	0.51
Luxembourg	0.3	0.51	0.35
Malaysia	0.42	0.39	0.19
Mauritius	0.1	0.41	0.65
Mexico	0.46	0.65	0.93
Moldova	0.58	0.76	0.32
Mongolia	0.6	0.5	0.45
Neth. Antilles	0.93	0.93	0
Netherlands	0.45	0.2	0.44
Nicaragua	0.09	0.94	0.71
Norway	0.48	0.56	0.75
Panama	0.01	1	0.91
Paraguay	0.06	0.81	0.43
Peru	0.38	0.13	0.45
Philippine	0.16	0.48	0.97
Poland	0.38	0.52	0.49
Portugal	0.23	0.55	0.36
PRC	1	0.5	0.36
Romania	0.19	0.69	0.67
Russia	0.67	0.83	0.91
S. Africa	0.55	0.1	0.85
Senegal	0.35	0.54	0.24
Slovakia	0.16	0.76	1
Slovenia	0.22	0.75	0.4
Spain	0.5	0.35	0.89
Sweden	0.58	0.83	0.5
Switzerland	0.8	0.61	0.85
Tajikistan	0.59	0.61	0.47
Thailand	0.12	0.72	0.68
Trinidad-T	0.18	0.04	0.59
UK	0.37	0.2	0.89
USA	0.8	0.56	0.84
Zimbabwe	0.32	0.49	0.06

Notes

1. Most attempts to provide definitions of the decentralization concept involve adding adjectives to the concept to delimit its dimensions. For example, see administrative decentralization (Rondinelli et al. 1984); fiscal decentralization (Bird 1993; Cheema and Rondinelli 1983); and democratic decentralization (Manor 1999). Leonard and Marshall (1982: 19-24) provide a categorization based on whether power or resources are decentralized and to whom.
2. This distinction is not new; the World Bank, among many others, makes exactly this division of the decentralization concept on its webpage <http://www1.worldbank.org/publicsector/decentralization/>.
3. Such enthusiasm is not without precedent; the prior apex of enthusiasm for decentralization was as a strategy to prolong colonial rule in much of Africa (Samoff 1990: 513).
4. In the 1950s and 1960s, centralization was promoted to deal with escalating demands and mass mobilization unleashed by decolonization and modernization (Huntington 1968). Over a four -year period in the 1990s, by contrast, 12 percent of all completed World Bank projects contained a decentralization component (Litvack 1998: 1).
5. See Snyder (1999) for an example of reregulation by lower levels when central governments shrank.
6. Cohen and Peterson (1997) note differences among geographers, political scientists, economists, lawyers, and public administration professionals, among others. They also note differences among English-, French-, and Spanish-speaking researchers.
7. See Collier and Adcock (1999) for a discussion of validity.
8. Fukasaku and Hausmann (1998) connect decentralization, democratization, and market reforms.
9. Yilmaz and Ebel (2002) discuss competing measures of decentralization in a single case.
10. For a preliminary application of these measures of decentralization in causal analysis, see Schneider (2003).
11. Thus, democratic devolution identifies the category of cases in which decentralization occurs to elected local authorities (Crook and Manor 1998). Privatization defines the category of cases in which decentralization occurs to organizations outside the government sector (Rondinelli et al. 1989). The non-governmental sector has been further disaggregated into private sector organizations that are for-profit versus non-governmental, voluntary associations (Leonard and Marshall 1982).
12. Others focus on the transfers between levels of government (Nice and Frederickson 1987; Ahmad 1996).
13. See *Government Finance Statistics Handbook* (IMF 2000). Also, see Byskov (2001) for a discussion of the reliability and validity of the data.
14. The results of the factor analysis are robust to different measures. For example, subnational expenditures and revenues as a percentage of GDP also load heavily on a single dimension.
15. Some might support subtracting transfers from the total revenues or subtracting earmarked expenditures from total expenditures. Doing so would mix the issue of impact, which underlies fiscal decentralization, with autonomy, which underlies administrative decentralization.
16. It should be noted that some applications of the categories differentiate a syndrome of characteristics, not just autonomy (Rondinelli 1990).
17. Simplifying the syndrome of characteristics into the single dimension of autonomy becomes more complicated when we consider other aspects of decentralization at the same time. For example, the level of autonomy becomes unclear when we compare a local government with significant resources (fiscal decentralization) and deconcentrated authority (administrative centralization) to a local authority with few resources (fiscal centralization) but devolved authority (administrative decentralization). Correct measurement of autonomy requires taking into account the interrelationship of the dimensions.

18. The kind of revenue is at best only a rough indicator of the amount of administrative control. Grants and loans can arrive either with conditions or without them. Though unconditional loans or grants (block grants) suggest local control, the fact that the center can withhold them implies some limitation of local autonomy. Own-taxes are probably the most controllable form of local revenue, though even in these revenues, the center can exert some authority by earmarking tax streams to certain expenditures.

19. See Schmitter (1971; 1974).

20. Federalism literature highlights the relationship between decentralization, parties, and elections (Grodzins 1960).

21. For example, changes in fiscal decentralization can be either positively or negatively related to changes in administrative decentralization and/or political decentralization. Of course, the interaction could be more complex: e.g., decentralization along two dimensions could augment or offset decentralization along the third. These possibilities are more difficult to test statistically and have therefore been left out of the current exercise.

22. In Brazil, decentralized fiscal resources meant that local governments were implementing tasks constitutionally attributed to the central level (Afonso 1996).

23. For a more thorough discussion of factor analytic techniques, see Kim and Mueller (1978); Long (1983); or Bollen (1989). For an application, see Brady (1990).

24. Kim and Mueller discuss the use of confirmatory factor analysis techniques at length (1978: 32-37).

25. The equation for each observed variable is given by: $X_i = \Sigma_{ji} b_{ij} F_j + d_i U_i$ The observed variable is "X"; "F" is a common factor shared by two or more variables; and "U" is a factor unique to a given variable. The correlation between the observed variable and the shared factor is "b", and "d" is the correlation between the unique factor and the observed variable. The subscript $_i$ indicates the observed variable and the subscript $_j$ indicates the common factor.

26. Websites listed in the bibliography.

27. Using an indicator of democracy from the Polity IV database, eleven non-democratic cases were excluded from the analysis. The results were robust to excluding non-democracies.

28. The importance of transfers was reversed to keep the signs positive.

29. "Scree" is the geological term for the debris that collects below the rocky part of a slope.

30. The solution was rotated to obtain orthogonal factors using a varimax rotation option.

31. The factor scores provide an interval measure of the dimensions. The difference between a country that scores .1 and another that scores .2 is the same magnitude as the difference between countries that score .6 and .7. On the other hand, this cannot be interpreted as a ratio scale. Zero indicates that a country was simply the least decentralized among the sample; it does not mean that local jurisdictions had no resources, autonomy, or political functions.

32. <http://www1.worldbank.org/publicsector/decentralization/dataondecen.htm> accessed June, 2002.

33. Only a few countries changed position, and even they merely swapped places with a neighbor on the scales of the different dimensions.

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