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### Measuring Regional Authority

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## Measuring Regional Authority

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**ABSTRACT** This article sets out a conceptual basis for measuring regional authority and engages basic measurement issues. Regional authority is disaggregated into two domains (self-rule and shared rule) and these are operationalised in eight dimensions. The article concludes by examining the robustness of this measure across alternative measurement assumptions.

**KEY WORDS:** Regions, measurement, multilevel governance, authority

### Introduction

Mathematical statistics is concerned with the connection between inference and data. Measurement theory is concerned with the connection between data and reality. Both statistical theory and measurement theory are necessary to make inferences about reality (Sarle Warren, 1997).

The structure of government—the allocation of authority across general purpose jurisdictions—is perceived to affect political participation, accountability, ethnic and territorial conflict, policy innovation, corruption, government spending, democratic stability and the incidence of human rights abuse. It has proved easier to formulate hypotheses concerning these and other effects of government structure than to test their validity. Most empirical studies use quite sophisticated, often direct, measures for the phenomena that are said to be affected by government structure (e.g. conflict, participation, government spending), but rudimentary, often indirect, measures for government structure itself.

The most refined data on government structure are financial data provided by the Organization for Economic Cooperation and Development (OECD). These data have been used to good effect, but they do not allow one to distinguish among levels of subnational government. Moreover, it is unclear whether or to what extent the authority of an institution is correlated with the amount of money it spends or raises. In several countries, as discussed below, the central state tells subnational governments not just how much they can spend, but on what they must spend it. Alongside these data are

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direct, but relatively crude, measures of the number of subnational levels, and categorizations of, for example, federal versus non-federal systems, whether or not subnational governments have residual powers, whether or not the central state can veto subnational decisions, whether or not subnational executives are elected, and whether or not subnational governments have revenue-raising authority.<sup>1</sup>

These measures have some serious limitations. They compress regional and local architecture into a centralization/decentralization dichotomy. Such measures tap the extent to which the national state monopolizes authority, but they do not tell us how government below the national level is structured. They conceive government within countries in unidimensional terms as the ‘other’, the ‘*not* central state’. Centralization/decentralization measures, no matter how accurate, are ill-suited for inquiry into the scale and structure of government below the national state.

Existing measures focus on the fundamental distinction between federal and non-federal countries, but are insensitive to variation among federal countries or among non-federal countries (Rodden, 2004).<sup>2</sup> As a consequence, such measures are biased against temporal variation. Most measures estimate a constant for each country over the post-World War II period, or where they score countries over time, they detect little change.<sup>3</sup> This has not stopped social scientists from hypothesizing sources and consequences of institutional change, but it has meant that hypotheses about change have been evaluated against data for different countries at one point in time.<sup>4</sup>

Our interest in the topic springs from a desire to know more about how governments are structured. At no time in recorded history has a single set of units monopolized authority on Earth. Large units—empires and states—have always been several jurisdictional layers deep and most medium and even small units have not been uni-level. The resulting pattern is far from uniform. There appears to be massive variation—over historical time and cross-sectionally—in the shape of government.

How might one conceive such variation? Individuals are encompassed in multiple jurisdictions operating at diverse territorial scales from the local to the global. Only in rare cases do borders intersect, so it makes sense to speak of levels or tiers. Government—the exercise of legitimate authority—is structured across multiple levels of non-intersecting jurisdictions. The number of such levels for most people living today is between three and seven, of which between one and five exist within their national state. All have one or two levels of local government, and one, two, or three levels of intermediate or regional government below the national level.

Why this structure? Why have what appears to be a convoluted pattern of jurisdictions instead of a simpler set-up, the centralized national state? How does the territorial structure of government vary across time and place, and how might one generalize about it? These are fundamental and difficult questions that lie at the heart of a science of politics, and which have been taken up by political philosophers, including Aristotle, Rousseau and Althusius, and political scientists, such as Karl Deutsch and Robert Dahl.

The purpose of this special issue is to measure the authority of intermediate or regional governments in 42 democracies or quasi-democracies on an annual basis over the period 1950–2006. Twenty-nine OECD countries, the 27 countries that are members of the European Union (20 of these are members of the OECD), plus Albania, Bosnia and Herzegovina, Croatia, Macedonia, Russia, and Serbia and Montenegro are included.

This article sets out our method. The next section defines the unit of analysis, the region, and conceptualizes authority as having two domains—self-rule and shared rule—which are disaggregated along eight dimensions. The article that follows operationalizes these dimensions. The appendix to this special issue provides tables with scores for regional levels and for regional levels aggregated by country. The final section of this article explores the robustness of the measure across alternative scoring systems.

Much effort is devoted to laying all of this bare before the reader to maximize the possibility that measurement errors may be detected and corrected. This is all the more important because until these observations are replicated by others, their reliability cannot be estimated. To what extent would a second, third, or  $n^{\text{th}}$  expert arrive at scores similar to the ones presented here? This question cannot be answered. What can be done, however, is to compare our observations with those in existing datasets, while making the coding explicit so that others may replicate, amend or refute our decisions (Marks, 2007).<sup>5</sup>

### Region as a Unit of Analysis

The region is a rubbery concept stretching above and below the national state. The focus here is on subnational regions, but there is no generally accepted definition that will produce a set of homogeneous units for cross-national comparison. The immediate task then is to conceptualize the region in a way that meets, as far as possible, normal linguistic usage while providing the researcher with a meaningful and unambiguous unit of analysis.

- A region refers to a *given territory* having a *single, continuous, and non-intersecting boundary*.
- Subnational regions are *intermediate* between local and national governments.
- A regional government is a *set of legislative and executive institutions responsible for authoritative decision making*.

For the purpose of this study, then, a regional government is the government of a *coherent territorial entity situated between local and national levels with a capacity for authoritative decision making*.

This definition is a minimal one. It says nothing about the region as an economic, social or cultural entity. Nor does it encompass possible sources of regional authority, such as regional mobilization, regional identity or the degree of centralization or decentralization among political parties. We wish to facilitate empirical analysis of the causal relationships between these and regional authority, and so we seek to disentangle regional authority from its hypothesized sources.

Then there is the vexed issue of the possible existence of more than one level of regional government in a country. Local governments and national governments define extremes within which there may be more than one intermediate level. How does one determine which level is the regional? In previous work, Hooghe and Marks (2001) measured the authority of the principal regional level. But this is problematic, for they underestimated regional authority in countries where there are two or

more regional levels. So now the authority exercised by all levels of government below the national level, with an average population greater than 150 000, is measured.<sup>6</sup>

### Authority

We wish to measure the extent to which a regional government exercises formal authority. Here, standard political science definitions serve our purpose well (Dahl, 1968).

- *Formal authority* is authority exercised in relation to *explicit rules*, usually, but not necessarily, written in constitutions and in legislation.
- *Authority* is *legitimate power*—power recognized as binding because it is derived from accepted principles of governance.
- *Power* is the ability of *A* to get *B* to do something that *B* would not otherwise do.

The distinctions here are important, for the power exercised by a regional government may be different from its formal authority. Formal authority is only one ingredient in the ability of a regional government to exert power, i.e. to get its way in the face of opposition. To evaluate formal authority, one must delve into the rules of the political game, and hence into constitutions, special statutes and, in some cases, established norms. But a valid measure of formal authority would not tell us how much power a regional government was able to exert. To do this, one would also have to take into account party structure, partisanship, regional and national leadership, public opinion and much else besides.

A regional government has some degree of formal authority over certain actions in a particular territorial jurisdiction. Therefore, one needs to specify the *territory* over which a regional government exercises authority (*A*); the *depth* of that authority (*B*); and the *spheres of action* over which it exercises authority (*C*).

With respect to territorial scope of authority (*A*), a regional government may exercise authority in its regional jurisdiction or it may do so in the country as a whole. This is the distinction between self-rule and shared rule, coined by Daniel Elazar (1987) and used widely in the study of federalism, decentralization and subnational authority (Page and Goldsmith, 1987; Watts, 1999; Braun, 2000; Rodden, 2004). The expression of authority in self-rule is fundamentally different from that in shared rule, and this distinction provides the frame for the index.

With respect to depth of authority (*B*), a regional government normally exerts authority in conjunction with the central government, whether in the region or in the country as a whole. One needs therefore to estimate the degree to which a regional government has an independent legislature and executive, the conditions under which it can act unilaterally, and its capacity to rule when opposed by the central state.

With respect to spheres of action (*C*), a regional government will have authority over some set of policies, among which taxation and constitutional reform are especially important.

### Dimensions of Regional Authority

These conceptual distinctions allow us to disaggregate regional authority into a set of dimensions for self-rule and shared rule. Table 1 lays out four dimensions which summarize regional authority in the region itself and four dimensions which summarize

**Table 1.** Dimensions of regional authority

Self-rule	The authority exercised by a regional government over those who live in its territory	
Institutional depth	The extent to which a regional government is autonomous rather than deconcentrated.	0–3
Policy scope	The range of policies for which a regional government is responsible.	0–4
Fiscal autonomy	The extent to which a regional government can independently tax its population.	0–4
Representation	The extent to which a regional government is endowed with an independent legislature and executive.	0–4
Shared rule	Authority exercised by a regional government or its representatives in the country as a whole	
Law making	The extent to which regional representatives co-determine national legislation.	0–2
Executive control	The extent to which a regional government co-determines national policy in intergovernmental meetings.	0–2
Fiscal control	The extent to which regional representatives co-determine the distribution of national tax revenues.	0–2
Constitutional reform	The extent to which regional representatives co-determine constitutional change.	0–3

regional authority in the country as a whole. Self-rule depends on the independence of a regional government from central domination and the scope of regional decision making. Accordingly, self-rule is operationalized as the extent to which a regional government has an independent executive, the scope of its policy competencies, its capacity to tax and the extent to which it has an independent legislature. Shared rule depends on the capacity of a regional government to shape central decision making. Central decision making is disaggregated across four areas: normal legislation, executive policy, taxation, and constitutional reform.

These dimensions are answers to the question: ‘How might one disaggregate the abstract quality, regional authority, so that one might measure it against observable variation among regions in a wide range of developed societies?’. On the one hand, we seek to encompass what is meant by regional authority; on the other, we seek to disaggregate the concept into pieces that can be independently assessed. We wish to represent an abstract concept by dimensions that are meaningful, simple (i.e. unidimensional) and observable.

The Cronbach’s alpha across the eight dimensions for 42 counties in 2006 is 0.94, which suggests that the dimensions can be interpreted as indicators of a single latent construct.<sup>7</sup> While the dimensions are conceptualized as distinct ingredients of authority, principal components analysis reveals that they hang together in two domains, self-rule and shared rule, and that these domains are associated strongly with each other ( $R = 0.64$ ; Table 2).

**Table 2.** Factor analysis of regional authority

Components	Single-factor solution	Two-factor solution	
		Self-rule	Shared rule
Institutional depth	0.89	<b>0.96</b>	0.62
Policy scope	0.92	<b>0.96</b>	0.70
Fiscal autonomy	0.87	<b>0.85</b>	0.71
Representation	0.83	<b>0.96</b>	0.53
Law making	0.85	0.60	<b>0.95</b>
Executive control	0.70	0.60	<b>0.68</b>
Fiscal control	0.85	0.61	<b>0.94</b>
Constitutional reform	0.79	0.55	<b>0.89</b>
Eigenvalue	5.61	4.87	4.70
Chi-squared	353.4		353.4
Explained variance (%)	70.2		82.8
Factor correlation			0.64

Note: Principal components factor analysis, oblimin non-orthogonal rotation, listwise deletion.  
 n = 42 (country scores in 2006). For the two-factor solution, the highest score for each dimension is in bold.

### Levels of Measurement

Measurement level is not a fixed attribute of a particular dataset, but depends on the purpose to which it is put. The measurement instrument described here can be used

- as an ordinal measure of regional authority;
- as an interval measure of regional authority;
- as an absolute measure of institutional reform.

Authority, like most concepts in political science, has no natural unit of measurement. While we conceive authority as an interval variable, we measure it by rank. If one were to limit inference to *permissible transformations*, i.e. transformations that do not alter the meaning of the measurements, one would be able to make inferences about more or less authority on each dimension while refraining from inferences about relative amounts of authority within or across the dimensions (Stevens, 1946).

What would one know, if one knew only that authority varies for each region along eight dimensions scaled as ranks progressing up from the lowest? Would observations aggregate in such a way as to allow (a) statements about change over time, such as ‘Belgian *provincies* have less authority in 2006 than in 1950’ or (b) cross-sectional statements, such as ‘In 2006, Canadian provinces had more authority than US states’.<sup>8</sup> That is to say, are observations *well ordered* across time and cross-sectionally?<sup>9</sup>

*Well ordered* sets are ones in which the eight dimensions hang together. The dataset consists of observations along eight dimensions for 89 units (regional tiers, asymmetrical regions, special autonomous regions) in 42 countries for up to 56 years. When we treat the scores on all dimensions for a single region over all years as a set, 80 of the 89 regions form *well ordered* sets, that is, sets where every subset (the eight

dimensions) can be permissibly transformed into a simple rank order.<sup>10</sup> One may also check for *well order* across dyads at one point in time. Appendix B at the end of this special issue plainly reveals that *well order* is rare in dyads of strong regions, such as the German *Länder* and the Swiss cantons. Here, one is dealing with different combinations of self-rule and shared rule, not with Russian dolls that fit into each other. But *well order* is common among other dyads. Of the 3828 dyads of regions in 2006 ( $n = 88$ ; excluding countries with no regional tier, but including special autonomous regions), 66.9% are *well ordered*.<sup>11</sup>

One can transform the ordinal scales into a summated rating scale by combining the scores across the dimensions. On the hypothesis that the ordinal categories represent equal intervals and that error is distributed randomly, the eight dimensions can be summed to a 24-point Regional Authority Index (Appendix B).<sup>12</sup> The index is correlated strongly with an interval measure derived from principal component analysis ( $R = 0.989$ ). The remainder of this special issue reports composite index scores on the ground that they are readily interpretable and express the intention to devise roughly equivalent intervals across dimensions of regional authority.

One cannot escape the fact that the weighting of dimensions is debatable and that it is likely we have made errors along the way. So it is useful to try to evaluate the difference our choices make. How much would country scores change if the relative weights of shared rule and self-rule were reversed? How sensitive is the measure to its individual components?

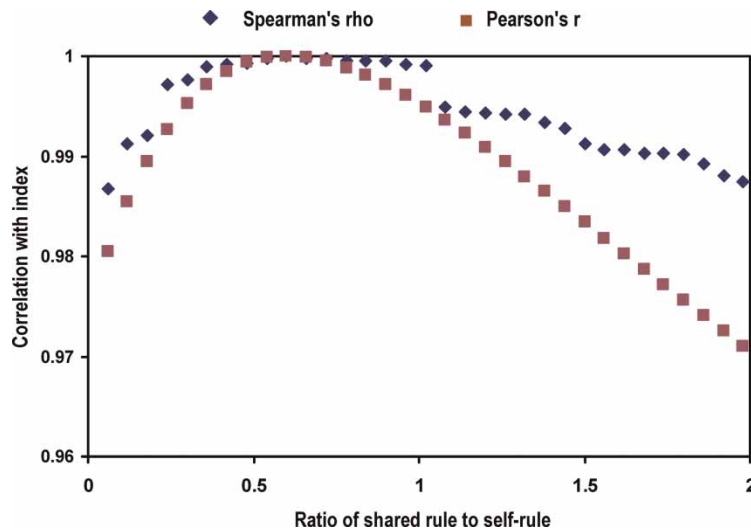
When the data are transformed to interval data, the eight dimensions hang together quite tightly. The Cronbach's alpha (0.94 for 2006) suggests that the index is robust across assignment of alternative weights to its components. When the weights assigned to self-rule and shared rule are reversed, the rank order among regions in 2006 is robust, yielding a Spearman's rho of 0.99 ( $n = 85$ ). Figure 1 plots correlations using interval data and shows that the index is robust across alternative weights for self-rule and shared rule.

Finally, the measure can be used as an instrument to detect reform of regional authority. If we define a reform as a change along one of the dimensions for a region or regional level, 384 reforms in 89 regional units are observed from 1950. If we define a reform as the set of changes along one or more dimensions for a particular region or regional level that take place in a given year, 157 reforms are observed. If we aggregate further and a reform is defined as the set of changes along one or more dimensions for one or more regional units in a country in a given year, 81 reforms are observed in the dataset. The unit of analysis may vary with the research question, but in each case the level of measurement is absolute.

### The Special Issue

The purpose of the following two articles is to detail and assess the measurement instrument and to set out a measurement strategy that may have more general application. The next article sets out a coding scheme for each dimension of regional authority, and it explains how particular cases or sets of cases that raise questions of interpretation are coded. This is where the measure hits the road, so to speak, and where, as a consequence, the reader will find the explanation of how abstract coding





**Figure 1.** Robustness of Regional Authority Index across alternative weights for shared rule and self-rule.

*Note:* Calculations are for 2006.  $n = 42$ . The Regional Authority Index weights self-rule to shared rule in the ratio of 5: 3. Spearman's rho is calculated on the ordinal scores and Pearson's r is calculated on the interval scores.

categories can be applied meaningfully across diverse contexts. Readers who have questions about the coding of regions in particular countries may consult Appendix A, which details case histories and all scores.

The third article compares the Regional Authority Index with seven alternative measures of regional authority or decentralization and finds that a common factor underlies the measures. Deviation between the index and other measures appears to reflect the fact that the index measures regional authority, rather than subnational authority in general, and is more sensitive in detecting variation among federations, among non-federations, and among different types of regions within a country.

The concluding article to this special issue illustrates how the measure can be used in ways discussed here; some general patterns are discerned and an attempt is made to explain them.

The appendices consist of detailed accounts of regional authority in 42 countries (Appendix A), a summary of the coding scheme followed by tables with scores for dimensions, regions and countries over time (Appendix B), and a library of primary and secondary sources on regional authority (Appendix C).

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## Notes

<sup>1</sup>For example, Castles (1999) and Lane and Ersson (2000) employ a dichotomous federalism variable. Treisman (2006) disaggregates decentralization into several dichotomous variables. The veto points literature usually relies on simple measures of federalism or decentralization. See, for example, Schmidt (2002), who includes a four-category evaluation of decentralization in his index.

<sup>2</sup>Rodden (2004: 482) notes that,

distinctions between various shades of decentralization and federalism have not been taken seriously. Questions about the design, content, and form of decentralization are glossed over not because the theories and hypotheses of interest are undifferentiated, but because more refined data are difficult to collect. The bluntness of these measures is often acknowledged but defended as the cost of achieving a large enough sample to make reliable inferences. . . . But do the favored indicators of decentralization actually measure the concepts addressed in the relevant theories?

<sup>3</sup>Brancati's (2006) measure scores eight countries for 1985 to 2000, Henderson's (1999, 2005) measure has eight time points, and Hooghe and Marks' (2001) measure has four decade-interval time points.

<sup>4</sup>The most comprehensive quantitative survey to date of the consequences of government structure notes that "as there is little variation over time in governance indicators ... panel regressions are inappropriate: valid inferences are only available from the sample's cross-section variation" (Inman, 2008: 15). Numerous country studies, however, detail considerable variation in government structure over time and suggest that the appearance of stability across time reflects the imprecision with which the phenomenon has been measured.

<sup>5</sup>Even if we had conventional statistical measures of reliability or of validity, it would be worthwhile to specify our measurement procedures as precisely as possible. All observations are, as Wittgenstein argued, theoretically impregnated. The implication, as Lakatos recognized, is that facts do not stand in relation to scientific theories as judges do to the accused, but are themselves cross-examined, or otherwise 'put in the dock'. In principle, as Wittgenstein and Lakatos agree, all measurements are questionable, but, as Adcock and Collier (2001: 531) noted, some measurements are more questionable than others: "At one extreme are concepts such as triangle, which are routinely understood in terms of a single conceptual systematization; at the other extreme are 'contested concepts,' such as democracy". The measurements undertaken here fall under the 'democracy' category.

<sup>6</sup>150 000 is the dividing line between regional and local government in the *nomenclature d'unités territoriales statistiques*, which is a geocode standard for referencing the administrative divisions of countries for statistical purposes.

<sup>7</sup>The Cronbach's alpha is 0.93 for the 21 countries that we measure in 1950, and is also 0.93 for the same countries in 2006.

<sup>8</sup>Only the statement about Belgian *provincies* can be inferred from the ordinal data. One cannot rank Canadian provinces and US states on the basis of the ordinal data because Canadian provinces have slightly more self-rule than US states and slightly less shared rule.

<sup>9</sup>If a set is *well ordered*, any two elements describe *more* or *less* in a coherent way. A set is (totally) *well ordered* if its elements can be arranged in a unique rank order which is isomorphic to a unique ordinal number and every non-empty subset has a least member.

<sup>10</sup>Regions that are not *well ordered* are German *Länder*, Swedish *Län*, *Ceuta* and *Melilla* in Spain, Russian *Subwekty federacii* and four regions in Belgium, the *Vlaamse Gemeenschap*, *Communauté Française*, *Région Wallonne* and the Brussels region. These cases are characterized by an increase on one dimension and a decline on another from one year to the next. Without being able to measure whether a decline on one dimension is larger or smaller than an increase in another (the ordinal constraint), one cannot estimate whether regional authority has increased, decreased, or remained the same.

<sup>11</sup>*Kosomet* is excluded in 2006 and the *autonomas comunidades* are counted as one tier.

<sup>12</sup>We do not know the true scores, and so cannot evaluate the validity of these assumptions. Monte Carlo tests suggest that regression models are quite robust to distortions that could arise from smooth monotone transformations, including summation of ordinal scores across rating scales (see for example, Shevlin *et al.*, 1997).

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