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February 2008

Online at <http://mpa.ub.uni-muenchen.de/8972/>
MPRA Paper No. 8972, posted 05. June 2008 / 20:49

Regional and Federal Studies
Vol. 18, No. 2&3, 143–166, April 2008

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ABSTRACT: This article validates the Regional Authority Index with seven widely used decentralization indices in the literature. A principal axis analysis reveals a common structure. The major source of disagreement between the Regional Authority Index and the other indices stems from the fact that the Regional Authority Index does not include local governance whereas most other indices do. Two other sources of disagreement concern the treatment of federal versus non-federal countries, and countries which have recently regionalized and/or have asymmetrical regions, whereby the more fine-grained Regional Authority index captures greater variation. The second part discusses content validity of fiscal indicators.

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INTRODUCTION

The purpose of this article is to validate the *Regional Authority Index*. One could distinguish between two reasons for assessing (internal) validity of measurements. First, by validating measurements, *commonalities* come to the fore. In how far do the measures measure the same? This is how assessing (internal) validity is usually understood. Another reason, however, may lie in exploring *differences* between measurements. When do measures of the same concept disagree? The answer to this question reveals information which might be helpful in deciding when or how to use one or the other measurement. In this article the validity of the Regional Authority Index is assessed by looking at the commonalities as well as the differences between the Regional Authority Index and other, widely used, regionalization and decentralization indices.

Three types of indices exist: indices measuring institutional decentralization/ regionalization, indices of fiscal decentralization/ regionalization or indices that combine institutional and fiscal components. Institutional indices have been developed by Mohammad Arzaghi and J. Vernon Henderson (2005), Dawn Brancati (2006), Liesbet Hooghe and Gary Marks (2001), Jan-Erik Lane and Svante Ersson (1999), Arend Lijphart (1999) and Daniel Treisman (2002).

Author's Note: I would like to thank Liesbet Hooghe, Lucas Leemann, Gary Marks and Jan Rovny for their helpful discussions and comments. Thanks also go to Dawn Brancati, Christine Kearney, Daniel Treisman, Jaap Woldendorp and Hans Keman for kindly providing their data. I owe a special debt of gratitude to the people of the Center for European Studies and the Political Science department at the University of North Carolina where most of the research was done.

Fiscal indices have been introduced by Dietmar Braun (2000), Frank Castles (1999), Dan Stegarescu (2005a), Jean-Philippe Meloche, François Vaillancourt and Serdar Yilmaz (2004), Robert Ebel and Serdar Yilmaz (2002), Ruben Enikolopov and Ekaterina Zhuravskaya (2007), and Wallace Oates (1972). Some authors combine the two types into one index, as does Jaap Woldendorp, Hans Keman and Ian Budge (2002).

Despite the abundance of indices, there is little systematic comparison of their validity (an important exception is Rodden (2004)). This article focuses on two types of validity (Ray 2007; Bollen 1989)¹:

Convergent validity assesses whether a given indicator is empirically associated with other indicators that conform to theoretical expectations: it involves comparing alternative measures of the same concept or comparing measures of different concepts (Ray 2007: 12). Measurements of the same concept, in our case, decentralization, should converge, that is, they should correlate across a given set of cases.

Content validity assesses the degree to which an indicator captures the content of the measured concept (Adcock and Collier 2001: 537). This is a “qualitative type of validity where the domain of the concept is made clear and the analyst judges whether the measures fully represent the domain” (Bollen 1989: 185). Testing for content validity “does not involve the comparison of a measure with any other quantitative data, and can be employed even before any data is collected” (Ray 2007: 12). Content validity means that scholars agree on the definition of decentralization, or agree on how decentralization can be broken down into different types of decentralization. The measurements may differ in their ‘content’ because different theoretical assumptions underly them.

I assess convergent validity for the Regional Authority Index by comparing the index with seven institutional-type regionalization and decentralization indices commonly used in the literature. I do not use fiscal indices to examine convergent validity of the Regional Authority Index because there are major caveats with respect to content validity. I point out two caveats with conceptualizing and operationalizing fiscal decentralization.

In the next section, I introduce and compare seven institutional measures. Can decentralization be conceived as a single, continuous dimension? What is the common structure underlying these measures? I then test several hypotheses for explaining variation among the different measures, and I analyze the strongest cases of disagreement in greater detail. In the last section, I examine the content validity of fiscal indicators of decentralization.

DECENTRALIZATION INDICES

I conceive of decentralization as a single, continuous dimension ranging from centralization in which the central government monopolizes decision-making authority to decentralization in which subnational governments have extensive decision-making authority that falls short of a monopoly over authority. It is important to note that this is a simplification. Some authors differentiate among vertical vs. horizontal decentralization, or decentralization with respect to decision-making, appointment, electoral, fiscal or personnel (Treisman 2002), or between fiscal, political and administrative decentralization (Schneider 2003).

The Regional Authority Index is consistent with these understandings in that it too is composed of different components: institutional depth, policy scope, fiscal autonomy, representation, and law making, executive control, fiscal control and constitutional reform. However, the Regional Authority Index differs from some (but not all) indices in that it focuses on regional tiers, i.e. the intermediate tiers with a minimum average jurisdictional population size of 150,000. Several decentralization indices that I discuss here consider the dispersion of power across all subnational tiers, thus including the local tier, and sometimes they also include dispersion of power to interests groups (i.e. corporatism).

I compare the Regional Authority Index with the following indices:

Arzaghi and Henderson (2005)²

These authors present a “nuanced index of ‘institutional’ decentralization, or effective federalism” (Arzaghi and Henderson 2005: 1176) which they construct by assessing fiscal, political, and administrative responsibilities of subnational government. This index is an average of six indicators, each of which ranges from 0 to 4:

- Unitary (0) or federal (4) government structure;
- Election of a regional executive: no (0) or yes (4);
- Election of a local executive: no (0) or yes (4);
- Ability of the center to suspend lower levels of government or to override their decisions: no (4) or yes (0);
- Revenue raising authority of lower level governments: no (0), limited (2) or full (4);
- Revenue sharing: no (0), limited (2) or full (4).

The dataset consists of scores for five-year intervals between 1960–1995 for 16 European and OECD countries that overlap with the Regional Authority Index dataset.³

Brancati (2006)

This index measures *political decentralization*, which is understood as the vertical division of authority among subnational levels of government that have independent decision-making power over at least one issue area.

The index consists of three components, which together construct a scale ranging from 0 to 5:

- Subnational elections: 1 point when there are subnational elections;
- Subnational legislative control over policies: 1 point each for: tax authority, education and public order/police;
- Subnational veto over constitutional amendments: 1.

The dataset consists of 40 European, Balkan and OECD countries⁴, for the years 1985–2000.⁵

Hooghe and Marks (2001)

The Hooghe and Marks index is the only of seven which focuses on *regional autonomy* –rather than decentralization– within a country. This is an additive index of four components, ranging between 0 and 12:

- Constitutional federalism (0-4), which taps constitutional or legal provisions relating to regional government in the state. One point is assigned for each of the following characteristics (Hooghe and Marks 2001: 194):
 - Existence of a functioning regional tier of government;
 - Extensive authoritative competencies, including control over two or more of the following: taxation; police; education policy (including tertiary education); cultural policy; transport and communications policy; economic development; local government; and determination of

- regional political institutions (e.g., administrative hiring, budget process, timing of regional elections);
 - Specific regional competencies that are constitutionally guaranteed;
 - A federal state in which constitutional change is co-decided by the central state and regions.
- Special territorial autonomy (0-2), which refers to constitutional or legal provisions for home rule in special territories. The score is derived by multiplying the score for the extent of authoritative competencies in a special territory with a score that varies by the relative population size of the special territory, so that larger special territories weigh more heavily on the country score (Hooghe and Marks 2001: 200):
 - Scope of competencies:
 - 0.5 = weak competencies;
 - 1 = extensive competencies (see the list above).
 - Population coverage:
 - 1 = less than 10 percent of the population;
 - 2 = more than 10 percent of the population.
 - Role of regions in central government (0-4), whereby the authors distinguish between legislative and executive power sharing:
 - Legislative power sharing, if there is a chamber in the national legislature composed of representatives of regional governments or parliaments:
 - 0 = no chamber in the national legislature composed of representatives of regional governments or parliaments;
 - 1 = chamber without wide-ranging veto power;
 - 2 = chamber with wide-ranging veto power.
 - Executive power sharing:
 - 0 = no regular intergovernmental meetings between central state and regional executives;
 - 1 = regular meetings without authority to reach binding decisions;
 - 2 = regular meetings with authority to reach binding decisions.
 - Regional elections (0-2):
 - 1 = the regional assembly is indirectly elected;
 - 2 = the regional assembly is directly elected.

The dataset covers 14 West-European countries⁶, with for each country four time-points of evaluation: 1950, 1970, 1990 and 2000.

Lane and Ersson (1999)

This is an index of decentralization which is understood as “the territorial location of public decision and implementation functions at various levels of government” (Lane and Ersson 1999: 207).

The index consists of four discrete components for a total of 10 points:

- Extent of federalism (0-3);
- Special territorial autonomy (0-2);
- Functional autonomy (0-2);
- Local government discretion (0-3).

The dataset contains scores for 18 West-European countries⁷, and has one data point capturing decentralization in the post-Second World War periods⁸.

Lijphart (1999)

Lijphart measures federalism and decentralization which he conceives as one dimension. The index consists of five ordinal categories which construe a scale that ranges from 1 to 5:

- 1= unitary and centralized;
- 2= unitary and decentralized;
- 3= semi-federal;
- 4= federal and centralized;
- 5= federal and decentralized.

This dataset consists of 36 countries, of which 24 West-European and OECD countries overlap with the Regional Authority Index.⁹ There is one score which is an average evaluation of the post-Second World War period.¹⁰

Treisman (2002)

Treisman focuses on decentralization, and he measures different types: vertical, decision-making, appointment, electoral, fiscal and personnel decentralization.¹¹ Decision-making decentralization comes closest to the definition of decentralization used in this article, and I therefore use it to validate the Regional Authority Index.

An index of decision-making decentralization can be made by summing three components of decentralization identified by Treisman, which creates a scale ranging from 0 to 3¹²:

Weak autonomy = 1: the constitution reserves to subnational legislatures the exclusive right to legislate on at least one specific policy area or if subnational legislatures have residual authority;

Residual autonomy = 1: the constitution gives subnational legislatures the exclusive right to legislate on policy areas not specifically assigned in the constitution;

Subnational veto = 1: there is a regionally-elected upper chamber that has the constitutional right to block legislation.

The dataset covers 41 European, Balkan and OECD-countries¹³, and the scores reflect the situation in the mid-1990s.

Woldendorp, Keman and Budge (2000)

Their autonomy index measures "how independent the non-central units of government are as regards policy making" (Woldendorp *et al.*, 2000: 35).

The autonomy index consists of four components, which combine in a scale from 0 to 8.

Central fiscalization (0-2)¹⁴:

- 2: if a country has a degree of fiscal centralization lower than 75%;
- 1: if a country has a degree of fiscal centralization between 75% and 90%;
- 0: if a country has a degree of fiscal centralization equal to or more than 90%.

Regional autonomy (0-2):

- 2: if regional autonomy is formally laid down (as is the case in federalist states);
- 1: if the country is a semi-federalist system;
- 0: neither.

Centralization (0-2):

- 2: if the state is not considered to be centralized;
- 1: if the state is considered to be medium centralized;
- 0: if the state is considered to be highly centralized.

Local government autonomy (0-2):

2: if three conditions are met: local government is mentioned in the constitution, its autonomy is recognized, and it is guaranteed own representation;

1: if one of these conditions is met;

0: all other cases.

The dataset contains 37 European, Balkan and OECD-countries¹⁵, and there is one time-point of evaluation which reflects the post-Second World War period.¹⁶

Factor analysis

To see whether these diverse measures of a single concept –decentralization– have a common structure, a principal axis analysis is employed (Marks *et al.* 2007).¹⁷ Since the number of countries for which we have scores differs per decentralization index, I perform four separate factor analyses so that I can maximize the number of cases. The factor analyses in Table 1 reveal that the indices do indeed have a common structure. In each analysis, the principal axis has an eigenvalue well above one, and the explained variance is 75% or more. The Regional Authority Index measure loads strongly on the principal axis in all four analyses. Lijphart's and Hooghe and Marks', and to a lesser extent Brancati's and Treisman's measure also load heavily on the principal axis.

SOURCES AND CASES OF DISAGREEMENT

In this section, I explore the sources of disagreement between the decentralization indexes and I pay close attention to the most important cases of disagreement. The decentralization indices can be considered as expert judgments. As can be seen from the description of the indices, each expert uses her/his own criteria. Although there are commonalities in these criteria, there are also many differences. Furthermore, experts differ in their level of knowledge for different countries. One may hypothesize that this all leads to different evaluations of subnational autonomy in countries.

Sources of disagreement

To explore the structure of disagreement between the Regional Authority Index and the other measures, the Regional Authority Index is regressed on each decentralization index.¹⁸ By exploring the residuals from regressing the Regional Authority Index on one of the other decentralization indices one can see when the measures disagree. I am interested in *systematic* sources of bias or error –not in random error. Where can we expect to observe larger residuals, that is to say, where can we expect the scores of the Regional Authority Index to differ systematically from those of one of the other indices?

No regional tier

One major difference between the Regional Authority Index and all but one of the alternative seven indices is that the Regional Authority Index only captures intermediate regional tiers, not local government. The Regional Authority Index also excludes regional tiers with an average population size below 150,000 people. Six of the seven other indices consider local as well as regional government in assessing decentralization. So the Regional Authority Index is designed to measure regional government, and this, one would expect, is somewhat *conceptually* distinct from decentralization, which the other indices measure. It seems reasonable, then, to expect negative residuals for countries which have only one subnational government tier, which are countries with local government only. That is to say, the Regional Authority Index should under-estimate decentralization in countries that have only a local tier.

Table 1. Factor analyses of seven decentralization indices and the Regional Authority Index.

Decentralization index	Factor analysis I	Factor analysis II	Factor analysis III	Factor analysis IV
Regional Authority Index	0.996	0.934	0.920	0.910
Arzaghi and Henderson (2005)	0.748	—	—	—
Brancati (2006)	0.771	0.840	0.917	0.906
Hooghe and Marks (2001)	0.945	0.924	—	—
Lane and Ersson (1999)	0.809	0.740	—	—
Lijphart (1999)	0.894	0.923	0.931	—
Treisman (2002)	0.824	0.884	0.869	0.906
Woldendorp <i>et al.</i> (2000)	0.920	0.789	0.874	0.866
N	7	14	23	36
Eigenvalue	6.017	5.232	4.072	3.209
Explained Variance	75%	75%	81%	80%

Note: All indices are standardized. Shown are the factor loadings resulting from a principal axis analysis. The following time periods are compared with each other: Regional Authority Index (average for 1950–2006); Arzaghi and Henderson (average score of eight, five-year intervals between 1960–1995); Brancati (one score for 1985–2000); Hooghe and Marks (average of four time points: 1950, 1970, 1990, 2000); Lane and Ersson (one score for 1945–1995); Lijphart (one score for 1945–1996); Treisman (one score for the mid-1990s); Woldendorp *et al.* (one score for 1945–1998).

Federal versus non-federal countries

The fine-grained character of the Regional Authority Index allows for capturing graduations in the extent of regional autonomy – even in countries with highly autonomous regions, such as federal countries. This is different from most indices, which usually employ a sharply discontinuous measure, sometimes simply dichotomous, that distinguishes federal from non-federal countries. Lijphart, for example, assigns all federal countries a score of 5 whereas only Austria scores a 4.5. All federal countries, except Austria, thus receive the highest score while non-federal countries are allowed to have more differentiated scores (between 1, 2, and 3).

The Regional Authority Index is more sensitive to variation within the federal category: the range among federal countries is 14, from about 17 (Austria and the Russian Federation) to almost 30 (Germany) up to about 31 (Bosnia and Herzegovina). This range is about the same as it is for non-federal countries which vary between 0 (multiple countries) to about 14 (the Netherlands and Sweden).

Other indices, however, work exactly the opposite way: they tend to treat the non-federal countries more as a homogenous group and allow more variation among the federal countries.

Treisman's measure, for example, gives only six out of 33 non-federal countries a score higher than zero, whereas all eight federal countries score between 1 and 3.

Differential sensitivity in measurement should produce systematic differences in scoring. That is to say, for some indices, such as Lijphart's, one would expect the residuals with the Regional Authority Index to be larger for federal countries than for non-federal countries. Conversely, for other indices such as Treisman's, the residuals should be smaller for federal countries and larger for non-federal ones.

These different biases in scoring become apparent when one compares, for each index, means, standard deviations and ranges for federal with those for non-federal countries (see Table 2).

Table 2. Comparison of means, standard deviations, and ranges between federal and non-federal countries for eight decentralization indices (standardized).

Decentralization index	Federal countries				Non-federal countries				Ratio
	Mean	St. dev.	N	Min – Max	Mean	St. dev.	N	Min – Max	
Arzaghi and Henderson (2005)	0.873	0.776	5	-0.892 – 1.400	-0.397	0.825	11	-1.351 – 0.942	0.941
Brancati (2006)	1.203	0.863	9	-0.318 – 2.616	-0.349	0.736	31	-2.274 – 1.638	1.173
Hooghe and Marks (2001)	1.829	0.323	8	1.527 – 2.131	-0.305	0.700	48	-0.890 – 1.829	0.423
Lane and Ersson (1999)	1.259	1.033	3	0.663 – 2.452	-0.252	0.809	15	-1.127 – 1.259	1.277
Lijphart (1999)	1.539	0.128	6	1.278 – 1.592	-0.513	0.483	18	-0.917 – 0.400	0.265
Treisman (2002)	1.396	0.821	8	0.525 – 2.848	-0.319	0.727	33	-0.636 – 1.687	1.129
Woldendorp <i>et al.</i> (2000)	1.468	0.690	7	0.616 – 2.243	-0.342	0.709	30	-1.554 – 0.616	0.973
Regional Authority Index	1.477	0.547	9	0.896 – 2.340	-0.409	0.652	33	-1.030 – 1.452	0.839

Note: The ratio score is obtained by dividing the standard deviation for federal countries by the standard deviation of non-federal countries. A ratio of more than 1 indicates that federal countries vary more in their scores than non-federal countries. A ratio score of less than 1 indicates that non-federal countries vary more than in their scores than federal countries.

The following countries were considered federal for most of the time during their democratic existence in the post-Second World War period: Australia, Austria, Bosnia and Herzegovina, Canada, Germany, Russian Federation, Serbia and Montenegro, Switzerland and the United States.

All decentralization indices are able to differentiate between federal and non-federal countries, i.e. the mean score for non-federal countries is significantly different from the mean for federal countries.¹⁹ This means that all decentralization indices pick up *between-group* differences. But not all measures are equally suited to capture *within-group* differences.

The ratio measure in Table 2 gives a sense of this. The ratio is calculated by dividing the standard deviation of federal countries by that of non-federal countries. A ratio larger than one indicates that the decentralization index is biased to capturing variation among federal countries, a ratio smaller than one indicates the opposite. One can see that the Regional Authority Index, Arzaghi and Henderson and Woldendorp *et al.* differentiate equally between countries *within each group*. Hooghe and Marks and Lijphart tend to treat the federal countries as a homogenous group whereas Brancati, Lane and Ersson and Treisman tend to treat non-federal countries as a homogenous group.

One may expect differences in scoring to lead to negative residuals (underestimation by the Regional Authority Index) for federal countries for the Hooghe and Marks and Lijphart

measures whereas it should lead to positive residuals (overestimation by the Regional Authority Index) for federal countries for the Brancati, Lane and Ersson and Treisman measures.

Table 3. Analysis of the *absolute* residuals of the regression of RAI on the different decentralization indices (all indices are standardized).

Source of disagreement	Arzaghi and Henderson (2005)	Brancati (2006)	Hooghe and Marks (2001)	Lane and Ersson (1999)	Lijphart (1999)	Treisman (2002)	Woldendorp <i>et al.</i> (2000)
No Regional Tier	—	0.673*** (0.196)	—	0.321 (0.341)	0.199 (0.154)	0.361*** (0.131)	0.071 (0.160)
Federal-Non-federal	-0.032 (0.128) ^a	0.276 (0.172)	-0.087 (0.245) ^a	0.547* (0.296)	0.044 (0.112)	0.314** (0.126)	0.012 (0.153)
Asymmetry/Regionalized	-0.046 (0.081) ^a	0.047 (0.109)	-0.051 (0.090) ^a	0.197 (0.139)	0.193*** (0.066)	0.037 (0.077)	0.028 (0.090)
N	98	40	51	18	24	41	37
R ²	0.02	0.26	0.02	0.22	0.30	0.23	0.01
Adj. R ²	—	0.20	—	0.05	0.20	0.17	-0.08

Note: * p < 0.10; ** p < 0.05; *** p < 0.01.

The residuals are regressed on the different sources of disagreement. Shown are the beta-coefficients and their standard errors.

^a cluster corrected standard errors (Arzaghi and Henderson (2005): 16 countries × 8 time points; Hooghe and Marks (2001): 14 countries × 4 time points).

Table 4. Analysis of the *raw* residuals of the regression of RAI on the different decentralization indices (all indices are standardized).

Source of disagreement	Arzaghi and Henderson (2005)	Brancati (2006)	Hooghe and Marks (2001)	Lane and Ersson (1999)	Lijphart (1999)	Treisman (2002)	Woldendorp <i>et al.</i> (2000)
No Regional Tier	—	-1.093*** (0.256)	—	-0.221 (0.514)	-0.304 (0.259)	-0.766*** (0.209)	-0.493** (0.238)
Federal-Non-federal	0.413* (0.233) ^a	0.457** (0.225)	-0.232 (0.356) ^a	0.910* (0.446)	-0.144 (0.187)	0.180 (0.201)	0.318 (0.228)
Asymmetry/Regionalized	-0.169 (0.152) ^a	0.133 (0.143)	0.057 (0.156) ^a	0.387* (0.210)	0.289** (0.111)	0.157 (0.123)	0.120 (0.134)
N	98	40	51	18	24	41	37
R ²	0.20	0.48	0.05	0.35	0.38	0.38	0.24
Adj. R ²	—	0.44	—	0.21	0.29	0.33	0.17

Note: * p < 0.10; ** p < 0.05; *** p < 0.01.

The residuals are regressed on the different sources of disagreement. Shown are the beta-coefficients and their standard errors. A negative sign means underestimation and a positive sign means overestimation of the Regional Authority Index.

^a cluster corrected standard errors (Arzaghi and Henderson (2005): 16 countries × 8 time points; Hooghe and Marks (2001): 14 countries × 4 time points).

Asymmetry and regionalizing

A last source of disagreement might be expected for countries that, for some reason or another, are complicated to evaluate. This may be so when a country has asymmetrical regions which depart from the general country pattern, or when decentralization in a country has been in flux recently. The vertical state structure is not necessarily uniform within a single country at a certain point in time *and* over time. A country might have a special autonomous region which has more autonomy than other subnational units, for example *Grønland* and the *Færøerne* in Denmark and *Åland* in Finland. There might also be differences between units of the same subnational tier. Examples are the historic communities versus the other *autonomas*

comunidades in Spain and the special statute regions versus the ordinary regions in Italy. Decentralization is a moving target. Subnational tiers may be created or abolished, autonomy may be deepened or revoked. In France, for example, the *régions* were institutionalized in 1964 and over time were granted more autonomy. How scholars evaluate these differences at a certain point in time may differ, and this, one would expect, should lead to variation in scoring.

Explaining disagreement

Testing these expectations requires that disagreement is operationalized. I use as measure the residuals from regressing the Regional Authority Index on the other decentralization indices. The first two sources of disagreement –presence or absence of a regional tier and federal or non-federal– are operationalized as dummy variables.²⁰ To measure asymmetry and dynamic regionalization, I construct an additive index (0-2), whereby I allocate a value of 1 to a country that has (had) asymmetric regions²¹, and a value of 1 to a the country that has experienced radical regionalization²² in the post-Second World War period. The Regional Authority Index is regressed on the decentralization indices and the residuals are subsequently regressed on the sources of disagreement variables.²³ I begin by considering absolute residuals and than look at raw residuals (taking the sign into account).

The absolute residual analysis in Table 3 shows that the sources of disagreement differ across decentralization indices. The strongest predictor of disagreement for Brancati and Treisman is the ‘no regional tier’ variable. The federal-non federal variable is effective in explaining disagreement with the Treisman index and the asymmetry/regionalized variable explains disagreement with the Lijphart variable. None of the factors appeared significantly associated with the residuals for Arzaghi and Henderson, Hooghe and Marks, Lane and Ersson , and Woldendorp *et al.*.

I repeat the same analysis for raw residuals and report the results in Table 4. The most striking result is that all beta-coefficients are negative for the ‘no regional tier’ variable which means that the Regional Authority Index systematically *underestimates* subnational autonomy of countries which have no regional tier.

Cases of disagreement

It is not only interesting to see what the sources of disagreement are but also whether disagreement is caused by certain countries. What are the outliers? I define a ‘case of disagreement’ as having a residual score of two standard deviations or more. Table 5 shows thirteen cases of disagreement involving nine countries. The differences in scoring for Cyprus, Finland, Luxembourg and Macedonia can be explained by the fact that the Regional Authority Index does not measure local government while the other decentralization indices do. But the precise scoring of these cases still raises some questions.

Table 5. Cases of disagreement between the Regional Authority Index and seven decentralization indices from the literature.

Country	Sign	Decentralization Index
Belgium	+	Brancati (2006)
Belgium	+	Hooghe and Marks (2001)
Cyprus	-	Brancati (2006)
Cyprus	-	Treisman (2002)
Finland	-	Woldendorp <i>et al.</i> (2000)
Germany	+	Brancati (2006)
Germany	+	Lane and Ersson (1999)
Luxembourg	-	Treisman (2002)
Macedonia	-	Brancati (2006)
Macedonia	-	Woldendorp <i>et al.</i> (2000)
Poland	-	Arzaghi and Henderson (2005)
Serbia and Montenegro	+	Brancati (2006)
Sweden	+	Hooghe and Marks (2001)

Note: A case of disagreement is defined as having a residual of above two standard deviations. The sign of the residual is also given. A positive sign signifies overestimation and a negative sign signifies underestimation of the Regional Authority Index. There are no cases of disagreement between the Regional Authority Index and Lijphart's (1999) measure.

Cyprus and Luxembourg score 1 (out of 3) on the Treisman measure since the Constitution of these countries reserves to subnational legislatures the exclusive right to legislate in at least one specific policy area. For Luxembourg this is birth, marriage, and death certificates²⁴ and for Cyprus it is town planning²⁵. This kind of scoring leads to some curious bedfellows: Australia and Russia also score 1 on Treisman's index, and yet it would be difficult to sustain that the states of Australia and the *federacii subwekty* in the Russian Federation have the same autonomy as the municipalities in Cyprus and Luxembourg. Treisman's index, then, may not be discriminatory enough to tap the full range of variation in decentralization.

A similar observation could be made for the Macedonian score on Brancati's index. Macedonia scores 3 out of 5, because local governments have authority over taxation (+1) and education (+1) and they have an elected assembly (+1). However, the 1995 Law on self-government strongly curtailed these powers as Brancati notes herself.²⁶ Macedonia's score of 3 ranks on par with the *regioni* in Italy, the *autonomas comunidades* in Spain, the Australian states, the Russian federal subjects and the Belgian *Gemeenschappen/Regio's*.

Woldendorp *et al.* give Macedonia a score of 4 (out of 7). The score reflects that local government is mentioned in the constitution in combination with independent rights and its own representative body (+2 points) and that fiscal centralization is lower than 75% (+2 points). The latter part of the scoring is contested by several more recent studies which highlight the limited tax autonomy of Macedonian local governments. Woldendorp *et al.* measure fiscal centralization as “Central Government Revenues as a % of General Government” (2000: 32-38) which is for Macedonia 44% (meaning that the local governments collect 66% of general government revenue). Financial governmental data for Macedonia is hard to find but the new Law on Local Government Finance (2002) assigns the levy of various taxes on property to local government units together with 3% of the personal income tax and access to an equalisation fund equal to 3% of value added taxes (Davey 2004). Local governments share in government expenditures as a percentage of general government expenditures was 7% in 2003 (Davey 2004). In light of this data the scoring of Macedonia by Woldendorp *et al.* is questionable for the post-2000 period but appears plausible for the 1991-1998 period (but see Todorovski 2001 for the late 1990s).

The higher score for Finland for Woldendorp *et al.* has to do with the fact that the Regional Authority Index does not measure local government. Finland scores high on subnational autonomy, a component of the Woldendorp *et al.* measure, which brings it on par with the Scandinavian as well as with the federal countries. Unlike its Scandinavian neighbors, Finland had no significant regional (or county) level of government before 1993, which is why the Regional Authority Index underestimates decentralization in Finland but not in the other Scandinavian countries.

A case where the source of disagreement lies in a different definition of the boundaries of the country is Serbia and Montenegro which is scored relatively lower on decentralization by Brancati than the Regional Authority Index. The main reason, it appears, is that Brancati focuses primarily on *Serbia* during 1985–2000, while the Regional Authority Index considers *Serbia and Montenegro* as a unit.²⁷

Three cases of disagreement concern differences in whether particular tiers are included or excluded.

The first is Belgium, which Hooghe and Marks give a lower score than the Regional Authority Index in 1970 and in 1990. The main reason for this disagreement is that Hooghe and Marks focused on one government tier –the most autonomous tier at a given time point– rather than on all intermediate tiers. In 1970, the most autonomous tier consisted of the provinces, and by 1990 –their next time point– it was the communities. The Regional Authority Index, on the other hand, evaluates all intermediate tiers of government present at any time point. Belgium is also a case of disagreement with the Brancati measure. The main reason is that Brancati also focused on one tier of government, namely the regions/communities but not the provinces. This results in a lower scoring by Brancati.

A third case of divergence, also with the Hooghe and Marks measure, is Sweden which is scored higher by the Regional Authority Index in 1950 and 1970. Hooghe and Marks consider the county governments in the Scandinavian countries as local and do not include them because their measure concerns regional autonomy. Hooghe and Marks therefore do not include the *län* in Sweden whereas the Regional Authority Index does²⁸, resulting in a lower scoring by Hooghe and Marks.

The remaining disagreements cannot be reduced to the local government factor, to country definition or to inclusion/exclusion of particular tiers.

A first and second case of divergence is Germany, which Lane and Ersson and Brancati score significantly lower on decentralization than the Regional Authority Index. Lane and Ersson give Germany 4 (out of 10), which places Germany at the same level as Denmark, Finland and the Netherlands. The main reason for this is Lane and Ersson's unusually expansive operationalization of decentralization: not only does it include local governance (+3 for Denmark and Finland), but also functional, neo-corporatist autonomy (+2 for the Netherlands).

Brancati scores Germany 3 (out of 5) as she estimates that the *Länder* do not have control over public order/police (-1) and constitutional amendments do not require *Länder* approval (-1). Both coding decisions are contestable. Public order/police is actually a concurrent power (Watts 1999 and Swenden 2006; this issue). On constitutional change, *Länder* approval of constitutional amendments is indispensable due to their dominance in the *Bundesrat* (this issue). Brancati does not measure shared power exercised via an upper chamber but the Regional Authority Index does.

Another case of disagreement with the Brancati measure concerns Cyprus. Brancati scores Cyprus 3 out of 5, while the Regional Authority Index scores it 0. The disagreement lies in the operationalization of decentralization. Closer examination shows that Brancati includes consociational arrangements laid down in the Constitution which decentralize authority to the Greek and Turkish Communities while the Regional Authority Index excludes decentralization to non-territorial actors.

A fourth and final case of disagreement is Poland which Arzaghi and Henderson score higher than the Regional Authority Index. The difference in opinion appears to be whether the central government has the ability to suspend or to override subnational decisions. According to Arzaghi and Henderson, the answer is no, and so Poland receives a score of 4 instead of 0 for this sub-indicator. The scoring of Poland seems to be incorrect. The highest regional tier, the *województwa*, have gained directly elected councils and more autonomy since the end of communism, but their decisions are still subject to central sanctioning (see the country profiles in this issue; Council of Europe 2000: 47-48 and Kowalczyk 2000: 228). Central control is even greater for the lower regional tier, *powiaty*, and for local government, the *gminy*, for which the central government has the right to override decisions and has the authority to suspend the councils (Council of Europe 2000: 46-51; Glowacki 2002: 113-114; Okraszewska and Kwiatkowski 2002: 201-202; Kowalczyk 2000: 222-228).

CONTENT VALIDITY OF FISCAL INDICATORS

Fiscal indicators are widely employed as an overall measure of decentralization (see for example Braun 2000; Castles 1999; Fisman and Gatti 2002; Lane and Ersson 1999; Oates 1972; and Stegarescu 2005b). These indicators are based upon two extensively used sources: the Governance Finance Statistics database by the International Monetary Fund and Historical and/or National Accounts and/or Revenue Statistics of the Organization of Economic Cooperation and Development. Many different operationalizations exist but the most broadly used operationalizations are the following:

- a. *subnational share of total government expenditures*
- b. *intergovernmental grant share (i.e. grants from higher tier governments) as a percentage of total subnational revenue*
- c. *subnational own revenue (i.e. revenues from taxes plus fees and levies) as a percentage of total subnational revenue*
- d. *subnational tax revenue share as a percentage of total subnational revenue*
- e. *subnational tax revenue share as a percentage of total government tax revenue*

One can categorize the different operationalizations in two broad classes: expenditure (a and b) and revenue (c, d and e) aggregate fiscal indicators. Both classes of fiscal indicators raise two main caveats/problems with respect to content validity. First of all, fiscal indicators do not differentiate very well between decision-making authority and the authority to implement²⁹ and, therefore, cannot be used to measure subnational decision-making authority. The second caveat is that fiscal indicators do not measure effectively differences in subnational implementation powers.

Caveat 1: Expenditure and revenue fiscal indicators fail to capture how much decision-making authority subnational governments have and do not differentiate between decision-making and implementation.

To exemplify this caveat one may differentiate between *regulatory policies* and *policies involving the direct expenditure of public funds* (Majone 1994). This distinction helps us to tell apart policies with a direct bearing on the public budget, for example welfare state policies, from policies that are not expensive for government budgets but have considerable impact on society through the rules they impose, for example civil and criminal law. While the cost of expenditure programmes is borne by the public budget, the cost of most regulatory policies is borne by citizens and firms (Majone 1994).

To the extent that regions have control over regulatory policies, expenditure fiscal indicators would tell us nothing about decentralization. Imagine two countries, one in which subnational governments have the authority to implement expenditure policies (country A) and one in which subnational governments have authority regarding regulatory policies (country B). An expenditure fiscal indicator will score country A higher than country B on subnational decentralization. However, it would be wrong to conclude that country A is more decentralized than country B or that subnational governments in country A are more autonomous than those in country B. In fact, subnational governments in country B might have much more autonomy than those in country A since regulatory policies have to capacity to affect society deeply.

Fiscal indicators on the expenditure side are particularly problematic for capturing decision-making decentralization, since it does not tell us whether the expenditure comes from conditional or unconditional grants, whether the central government determines how the money should be spent, whether it sets the framework legislation within which subnational governments implement, or whether –indeed– subnational governments spend the money autonomously (Akai and Sakata 2002; Breuss and Eller 2004; Ebel and Yilmaz 2002; Fisman and Gatti 2002; Panizza 1999; Sharma 2006).

The argument can be shown empirically in a scatter plot of the Regional Authority Index against the subnational share of total government expenditure (see Figure 1). Subnational

governments in Scandinavian countries have the same (or higher) shares of total government expenditures than their peers in federal countries. To conclude from this that Scandinavian countries are as decentralized as federal countries would be wrong. Subnational governments in Scandinavian countries have less decision-making authority over policies, less taxation power, and they do not enjoy power sharing.³⁰ The national government decides policies and local and regional governments implement them (Rodden 2004).

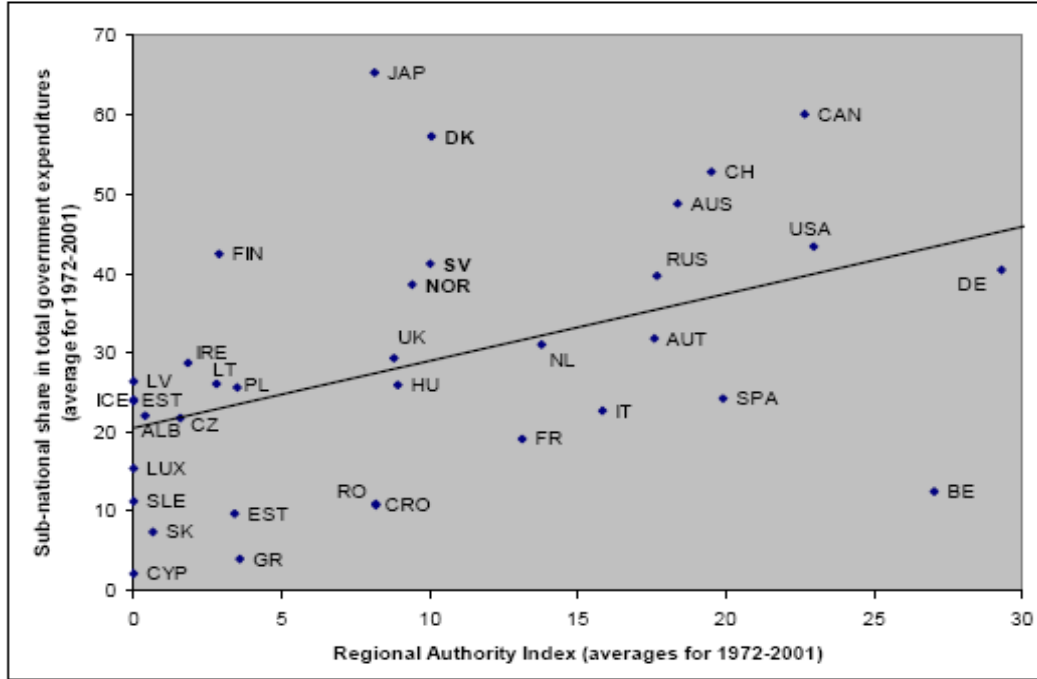


Figure 1. Subnational expenditure share as a percentage of total government expenditures plotted against scores on the Regional Authority Index (averages for 1972-2001).

The Pearson correlation between the two measures is 0.459 ($p < 0.01$; $N = 35$). Source: World Bank fiscal decentralization database.

One could 'correct' the indicator for subnational share by looking at the share of intergovernmental grants (Akai and Sakata 2002; Breus and Eller 2004; Oates 1972; Stegarescu 2005a). This indicator measures the amount of central government involvement in subnational provision of policies. Often a distinction is made between conditional (specific) and unconditional (general) grants, whereby it is generally assumed that central government involvement is higher with conditional grants (Shah 2007). A conditional grant ties expenditure to particular strings (conditions) imposed by the central government. But this does not solve the problem. Aside from data availability regarding unconditional and conditional grants (Rodden 2004), there is the problem that intergovernmental grants do not seem to differentiate between federal and non-federal countries (see Figure 2), as an One-way Anova analysis as regards to average (1972–2001) subnational intergovernmental grant share as a percentage of total subnational revenue bears out ($N = 35$; $F = 0.50$; $p = 0.482$)³¹.

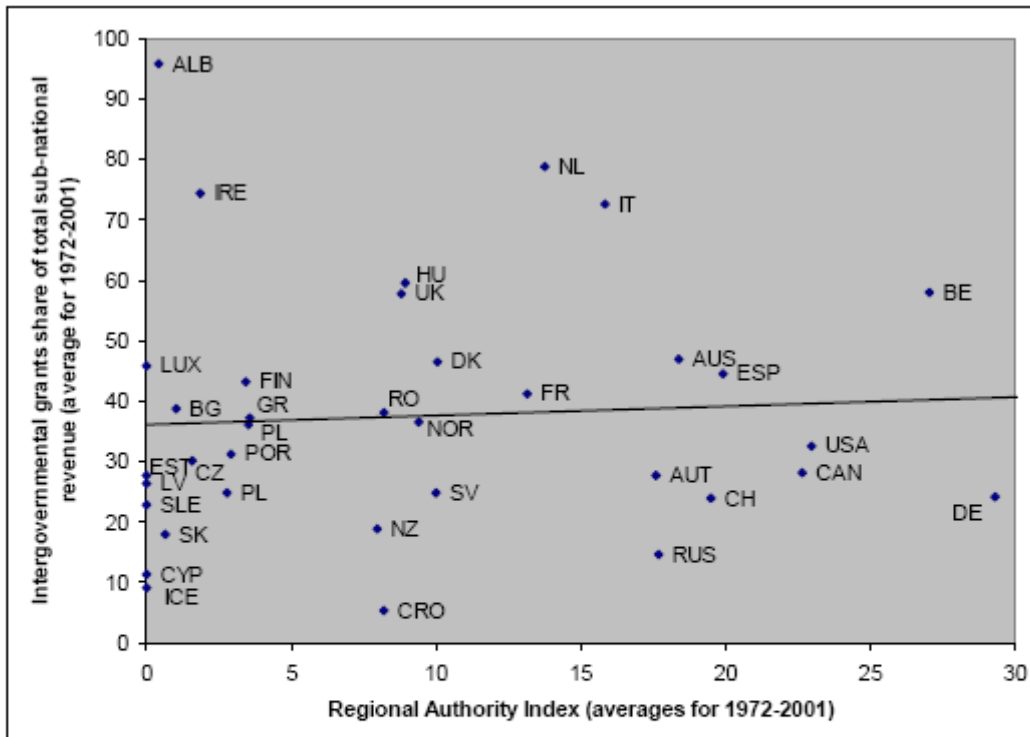


Figure 2. Intergovernmental grant share as a percentage of total subnational government revenue plotted against scores on the Regional Authority Index (averages for 1972-2001).

The Pearson correlation between the two measures is 0.034 (not significant; N = 36).
 Source: World Bank fiscal decentralization database.

Fiscal indicators on the revenue side are not biased against direct expenditure or regulatory policies. But they generate their own problems of concept validity. Revenue fiscal indicators do not help us figure out whether authorities that can tax autonomously can also decide autonomously what to do with the money (Ebel and Yilmaz 2002; Marlow 1988; Martinez-Vazquez and McNab 1997; Panizza 1999). While the revenue might be collected freely, it may have to be spent on policies laid down by the central government. There is no direct, theoretical or empirical, link between the authority to collect revenues and the authority to decide and implement policies.

This is apparent in Figure 3 which plots the average Regional Authority Index score for 1972–2001 against the subnational tax revenue as a percentage of total government tax revenue (averages for 1972–2001). The correlation is moderate and significant ($r = 0.47$, $p < 0.01$, $N = 36$). But a closer look at individual countries reveals that Sweden and Denmark are ranked at the same level as the USA and, to a lesser extent, the Russian federation and Switzerland, all three of which are federations. The counties in Denmark and Sweden may set the rate of income tax within central government parameters (this issue). But it would be wrong to conclude that the subnational tiers in Sweden and Denmark have the same policy and institutional autonomy as their peers in the USA, the Russian federation and Switzerland.

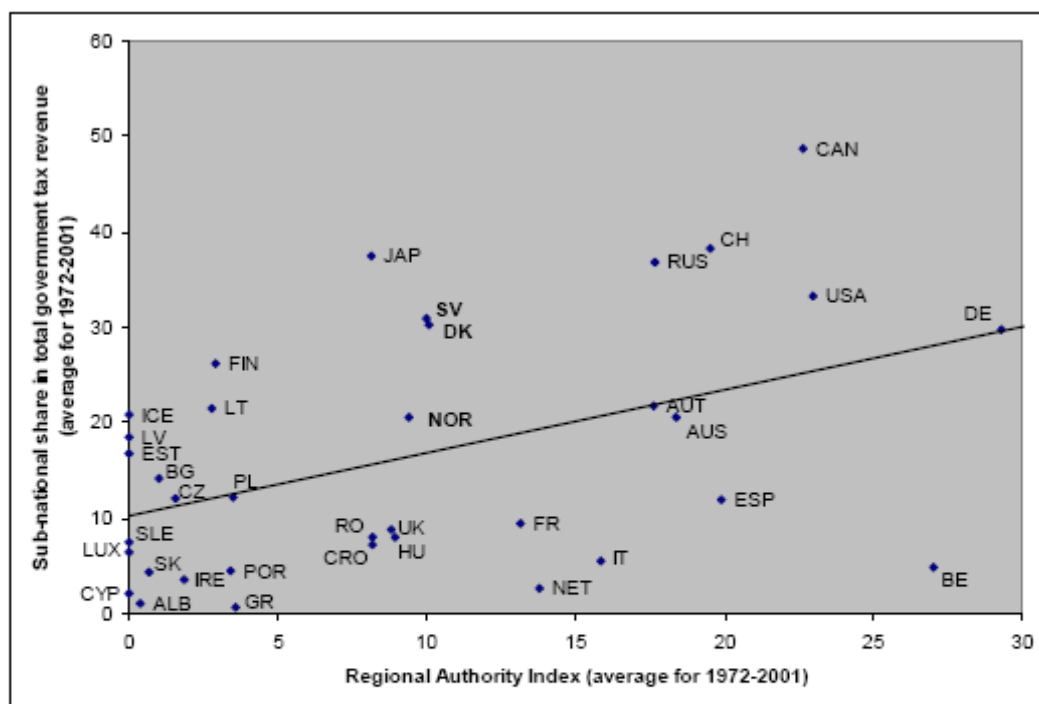


Figure 3. Subnational tax revenue share as a percentage of total government tax revenue plotted against scores on the Regional Authority Index (averages for 1972-2001).

The Pearson correlation between the two measures is 0.472 ($p < 0.01$; $N = 36$). Source: World Bank fiscal decentralization database.

The fundamental difference between the subnational tiers in Sweden and Denmark and the constituent units in federal countries is that the central government retains full decision-making rights regarding tax powers in the former –and can unilaterally change the rules if and whenever it so desires– while it is constitutionally bound to respect regional tax powers in the USA, Switzerland, and arguably even in semi-democratic Russia. Moreover, regional authorities in Sweden and Denmark have primarily administrative powers over a broad range of policies within a national legislative framework. In the USA, Switzerland and the Russian Federation subnational tiers have principal authority over a swathe of policies.³²

Caveat 2: Fiscal indicators do not necessarily measure differences in implementation authority.

There are two reasons. First, one cannot differentiate whether observed differences in fiscal centralization are due to genuine decentralization or whether they reflect differences in political economy. The argumentation is given by Oates (1972, p. 199–200):

“... even if there exists an identical allocation of functions among levels of government across two countries, their centralization ratios will generally differ if they do not have the same relative expenditure patterns on these functions. A country, for example, with an unusually large portion of its resources devoted to national defense will have, other things being equal, a relatively high degree of fiscal centralization. centralization ratios may differ because certain services provided publicly in one economy are provided in the private sector in another”

Note that this argument applies to the Regional Authority Index too but that fiscal indicators, and especially direct expenditure policies, are vulnerable to this problem. In the Scandinavian countries, a large proportion of government expenditure is devoted to welfare state policies, and these are often provided by subnational governments. In market-liberal Anglo-Saxon countries, welfare state functions tend to be privatized. So a difference in political economy explains higher expenditure (and revenue) in Scandinavian countries than in Anglo-Saxon countries whereas the allocation of functions among levels of government might be identical. The Regional Authority Index is not wholly invulnerable to the risk of conflating expenditure with authority, but since it relies on legal documents to gauge the allocation of functions rather than fiscal data, it avoids this problem to some extent.

Second, fiscal measures conflate whether an increase in fiscal numbers is the result of a shift in functions or resources between government tiers, or whether it simply reflects a change in the size of government activities (Stegarescu 2005a). An increase in fiscal decentralization might be due to a relative increase in either the *volume* or the *range* of public goods provided by subnational governments. In the former, authority has not increased; in the latter, it has. Imagine a country in which a subnational government provides unemployment benefits. If the following year the subnational government provides sickness pay as well as unemployment benefits, there will have been an increase in authority. This will coincide, presumably, with an increase in subnational expenditure share and/or in an increase in subnational tax share (to finance the increased expenditure). However, subnational expenditure (or revenue) could also have increased *without* an expansion of authority, for example, if unemployment had increased.

CONCLUSION

A comparison of the Regional Authority Index with seven decentralization indices in the literature shows a great amount of agreement. A single underlying factor accounts for about three-quarters of the variance. This is remarkable given the diverse ways of operationalizing a fluid concept such as decentralization.

An analysis of residuals (by regressing the Regional Authority Index on the seven decentralization indices) shows that the most consistent source of disagreement comes from the fact that the Regional Authority Index focuses on regional government to the exclusion of local government, while most decentralization indices include local government. A second source of difference relates to the sophistication of the measures. The more fine-grained Regional Authority Index is able to capture greater variation among both federal and unitary countries than most decentralization indices. Finally, countries-on-the-move, which have undergone major regionalization/federalization in the post-Second World War period, and countries with asymmetrical regions tend to generate more diverse scores differ across decentralization indexes than countries with greater architectural stability.

Finally, an analysis of the content validity of fiscal indicators examined the shortcomings of fiscal indicators as a measurement of subnational authority or decentralization. Two caveats were considered. First, fiscal indicators fail to capture whether subnational governments can decide autonomously what to do with the money. Second, we cannot tell whether differences in fiscal decentralization are due to genuine political decentralization or due to differences in

political economy and/or a change in the size of government activities. Their value as a proxy for decentralization appears therefore limited.

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¹ Bollen (1989) and Ray (2007) distinguish four types of validity. In addition to the two mentioned types of validity they identify criterion validity and construct validity. Criterion validity “involves the comparison of a measure with some other generally accepted measure of the same concept” (Ray 2007: 12). A given measure is compared to a ‘golden standard’. Since there is no ‘golden standard’ for decentralization, criterion validity cannot be assessed. Construct validity “assesses whether a measure relates to other observed variables in a way that is consistent with theoretically derived predictions” (Bollen 1989: 188). Construct validity is not assessed because theoretically derived predictions relating to the effects of regionalization and decentralization are imprecise.

² The dataset, from which the Arzaghi and Henderson (2005) scores are derived, was kindly provided by Christine A. Kearney.

³ Australia, Canada, France, Germany, Greece, Hungary, Italy, Japan, the Netherlands, Poland, Romania, Russian Federation, Spain, Turkey, United Kingdom, and the USA.

⁴ Australia, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Canada, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Lithuania, Luxembourg, Macedonia, the Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russian Federation, Serbia and Montenegro, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, and the USA.

⁵ Seventeen country scores were provided by Brancati (2006) herself (i.e. Belgium, Bosnia and Herzegovina, Canada, Estonia, Finland, Greece, Lithuania, Norway, Poland, Romania, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, and the United States). Twenty-three countries were and scored by the author on the basis of information provided by Brancati in personal communication.

⁶ Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal, Spain, Sweden and the United Kingdom.

⁷ Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

⁸ The authors do not refer to a precise time point but since their book concerns the 1945–1995 period it is reasonable to assume that they consider scores to be an average for this time period.

⁹ Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Malta, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom and the USA.

¹⁰ Lijphart (1999) presents average scores for the years 1945 to 1996.

¹¹ Vertical decentralization is operationalized as the number of tiers in a country (Treisman 2002: 5 and 14). The Pearson correlation with the Regional Authority Index is 0.546 ($p < 0.01$; $N = 38$). Appointment decentralization is conceptualized as the extent to which executive appointments are made by actors at the same (or lower) tier, rather than from above (“for each appointment that was made by an actor at a higher tier, one point is assigned for each tier that the appointer was above the appointee” Treisman 2002: 17). Electoral decentralization is operationalized as the extent to which subnational officials are elected (“percentage of subnational tiers at which the executive was chosen by direct

election or selected by a directly elected legislature" Treisman 2002: 18). Appointment and electoral decentralization appear to have affinity with the representation dimension of the Regional Authority Index, i.e. *executive* and *assembly*, respectively. The Pearson correlations are low: -0.144 (not significant; N = 38) and 0.215 (not significant; N = 39), respectively. Fiscal decentralization is the share of subnational government in total tax revenues or the share of subnational government in public expenditures. Both are fiscal indicators, and as I argue below, they raise important concept validity concerns.

Personnel decentralization is the share of subnational governments in total government administration employees (Treisman 2002: 19). The Pearson correlation between this indicator and the Regional Authority Index is 0.562 ($p < 0.01$; N = 32).

¹² The decision to sum three types of decision making decentralization is mine. Treisman is reluctant to combine the various measures of decentralization into a single index. For example, he notes that "*the right of subnational actors to interfere in central legislative decisions will not necessarily coincide with their autonomy from central interference, so it makes more sense to use [the] different types of indicators separately than to combine them*" (2002: 9-10). This is a defensible position, theoretically or empirically, it is perfectly possible that these different decentralization rights not coincide. The starting point in this article, and in the issue as a whole, is that decentralization is a multifaceted phenomenon which is best captured by combining measures of diverse components. The Regional Authority Index introduced in this special issue differentiates between self rule and shared rule, and these concepts resemble Treisman's notions of subnational autonomy from central interference and subnational actors right to interfere in central legislative decisions respectively. Just as the Regional Authority Index is a summation of self rule and shared rule, it seems sensible to combine the two indicators of decision-making decentralization into a single measure.

¹³ Albania, Australia, Austria, Belgium, Bulgaria, Canada, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Lithuania, Luxembourg, Macedonia, Malta, the Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, and the USA.

¹⁴ The operationalization of central fiscalization diverges somewhat from the one published in Woldendorp *et al.* (2000). The adjustments were made after communication with Hans Keman and Jaap Woldendorp.

¹⁵ Australia, Austria, Belgium, Bulgaria, Canada, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Lithuania, Luxembourg, Macedonia, Malta, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom and the USA.

¹⁶ The authors do not specify a particular time point, but since their book covers the 1945-1998 time span it seems reasonable to assume that their scores average the situation for the duration of this time period.

¹⁷ The Pearson correlations between the decentralization indexes are given in the appendix.

¹⁸ The approach is similar to the one developed by Marks *et al.* 2007 in cross-validating several measures of party positioning.

¹⁹ ANOVA results available upon request from the author.

²⁰ *No regional tier*: whether the country has a regional tier or not (0 = country has a regional tier; 1 = country has no regional tier, i.e. Cyprus, Estonia, Iceland, Latvia, Luxembourg, Macedonia, Malta, and Slovenia). *Federal-non federal*: whether the country has been a federal or non-federal country for the largest part of the post-Second World War period (since becoming democratic) (0 = non-federal country; 1 = federal country i.e. Australia, Austria, Bosnia and Herzegovina, Canada, Germany, Russian Federation, Serbia and Montenegro, Switzerland and the United States).

²¹ Countries which scored one point: Australia (Territories versus States), Belgium (*Gemeenschappen versus Regio's*), Canada (Territories versus Provinces), Denmark (*Færøerne and Grønland versus Amter*), Finland (*Åland*), Italy (*Regioni a statuto speciale versus Regioni a statuto ordinare*), Portugal (*Açores and Madeira*), Spain (*Ceuta and Mellila; historic Autonomas Comunidades versus the other Comunidades*), United Kingdom (Northern Ireland, London Regional Authority, Scotland and Wales versus Regions) and the United States (Alaska, Hawaii and Washington D.C. versus States).

²² The cut-off point of having regionalized is to have had an absolute change of at least 10 in the Regional Authority Index country score over the post-Second World War period. The following countries meet this criterion: Belgium, France, Italy, Spain and the United Kingdom. Since most changes involve more autonomy, I call this variable 'regionalized', though for the United Kingdom there almost as many 'negative' as positive changes (because of the suspension of the parliament of Northern Ireland and the abolishment of the counties in Northern Ireland, Scotland, Wales and parts of England). This does not need to concern us since the variable should indicate whether there is difference cross-sectionally and over-time. Differences increase the likelihood of disagreement.

²³ The Pearson correlations between the sources of disagreement and between the residuals of the different decentralization indices are given in the appendix.

²⁴ Art. 108 (dataset from Treisman).

²⁵ Art. 176 (dataset from Treisman).

²⁶ Data provided by Brancati (*pers. comm.*).

²⁷ The other decentralization indexes do not include Yugoslavia and/or Serbia and Montenegro for the time period in question.

²⁸ The upper chamber with *län* representation was abolished in 1971 and the Regional Authority Index score decreases for subsequent time periods. Therefore the time points 1990 and 2000 do not lead to a case of disagreement.

²⁹ The distinction between the authority to decide and the authority to implement is based upon Braun's (2000) 'Right to Decide' and 'Right to Act' respectively. "The Right to Decide refers to who may decide *what* will be done (policy formulation and decision-making). The Right to Act refers to who may decide on *how* it will be done (policy implementation)" (Braun 2000, p. 29; original italics).

³⁰ Sweden counties (*län*) were represented in an upper chamber before the 1971 parliamentary reform. The data reflect the 1972–2001 period.

³¹ The following countries were considered to be federal Australia, Austria, Belgium, Canada, Germany, Russia, Spain, Switzerland and the United States of America. Excluding Belgium and Spain from the federal group does not lead to different conclusions (oneway ANOVA analysis: $N = 35$; $F: 1.85$, $p = 0.182$).

³² One could extend this argument to the other countries in the dataset.

Appendix

Table A.1. Pearson correlations among eight decentralization indices.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Regional Authority Index	1							
(2) Arzaghi and Henderson (2005)	0.758**	1						
(3) Brancati (2006)	0.667**	0.607*	1					
(4) Hooghe and Marks (2001)	0.877**	0.799*	0.749**	1				
(5) Lane and Ersson (1999)	0.632**	0.439	0.566*	0.548*	1			
(6) Lijphart (1999)	0.856**	0.719*	0.791**	0.880**	0.839**	1		
(7) Treisman (2002)	0.790**	0.576*	0.790**	0.832**	0.628**	0.726**	1	
(8) Woldendorp <i>et al.</i> (2000)	0.740**	0.826**	0.721**	0.646*	0.808**	0.845**	0.671**	1

Note: * $p < 0.05$; ** $p < 0.01$. Pairwise deletion: $N = 42$.

Table A.2. Pearson correlations among disagreement estimators.

	No Regional Tier	Federal- Non federal	Asymmetry/ Regionalized
No Regional Tier	1		
Federal-Non federal	-0.253	1	
Asymmetry/Regionalized	-0.267*	-0.019	1

Note: * $p < 0.10$; ($N = 42$).

Table A.3. Pearson correlations among residuals for seven decentralization indices.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Arzaghi and Henderson (2005)	1						
(2) Brancati (2006)	0.494*	1					
(3) Hooghe and Marks (2001)	0.018	0.675***	1				
(4) Lane and Ersson (1999)	0.372	0.571**	0.304	1			
(5) Lijphart (1999)	0.123	0.601***	0.648**	0.829***	1		
(6) Treisman (2002)	0.147	0.756***	0.641**	0.353	0.456**	1	
(7) Woldendorp <i>et al.</i> (2000)	0.678***	0.656***	0.368	0.831***	0.636***	0.487***	1

Note: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$. Pairwise deletion: $N = 41$.