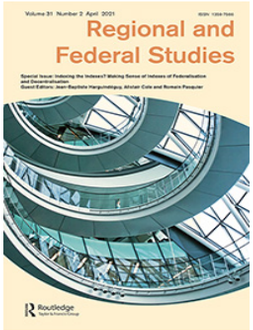

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Creating an index of local autonomy – theoretical, conceptual, and empirical issues

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ABSTRACT
Any attempt to create an overall measurement of local autonomy is confronted with difficult questions: Is local autonomy a one-dimensional concept? If it is multidimensional, what dimensions should be taken into account? Are legal, functional, financial, organizational, and vertical aspect of autonomy of equal importance, or must they be weighted? How can they be aggregated: can they simply be summed or are more complicated methods needed? On the basis of an international research project covering some 39 countries over 25 years, we will discuss the choices that have to be made and show what implications they have on results. The various solutions will be tested with respect to their internal consistency and their relations to other measurements of decentralization. An index always reduces complexity and tells only a part of the story, but it can be very useful for rankings, comparisons and further analyses.

KEYWORDS Local autonomy; decentralization; index; comparative; municipalities

Introduction

Indicators in general and indexes in particular are becoming increasingly popular in economic and social sciences as well as for policy making and politics. In the latter area, they are closely related to a trend towards evidence-based-policies (see for example Cartwright and Stegenga 2011) and the demand for more outcome-oriented politics – as claimed by New Public Management reforms, for example. International organizations, the European Union, national governments, and various administrative units increasingly base their policy decisions on a constant monitoring of developments using sometimes rather complex sets of variables and indicators. Sustainable development, bio-diversity, social inclusion, and good governance are just a few of the fields where substantial efforts have been made to measure actual developments.

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Indicators, however, are not entirely new and some have a clear political orientation. The well-known Freedom House Index, for example, dates back to the 1940s, when the US government funded a non-governmental organization (NGO) that conducts research and advocacy on democracy, political freedom, and human rights. Since 1972, Freedom House has published an annual report on the degree of democratic freedoms in nations around the world. It attempts to assess the state of civil and political rights on a scale from 1 (most free) to 7 (least free). Subsequently, there have been a variety of attempts to create similar indicators such as the Polity Project started by Ted Robert Gurr, the index of Vanhanen, and the Democracy Barometer (see Bühlmann, Merkel, and Wessels 2007). Similar attempts have also been developed in other fields: for example, the Corruption Perception Index by Transparency International and the indicators of Governance and Institutional Quality by the World Bank (WB). There are also indicators in domains where one could have more doubts about the feasibility of the endeavour, such as the World Happiness Report. Indicators very often result in rankings: the most competitive countries, the most innovative countries, etc.

In a more scientific perspective, indicators first of all have the advantage of reducing complexity. They combine a variety of variables into a single one, which reveals – and this is the crucial point – more than its components do. Only by combining all the variables used for the construction of the indicator can one grasp the extent of freedom and democracy in a country. Indicators help to classify units of observation in simple terms of more and less and they can, in the form of an independent variable, easily be included in a model to explain something (does democracy foster economy growth?) or as a dependent variable which has to be explained (what prevents or leads to less corruption?).

The creation of indicators, however, is a rather complex task. Quite often, it is done more or less intuitively by aggregating different variables. Such a procedure, however, does not take into account the different characteristics of the variables combined and the relations between them. The nature of the different indicators can vary and so does the way they have to be constructed. To some extent, this depends on the phenomenon to be covered by the index. A very useful distinction is the one between formative and reflexive indicators, as we will see below.

Using the creation of an index of local autonomy as a concrete example, we will show the methodological challenges and pitfalls of such an endeavour. They are not only technical but also theoretical and conceptual. Despite the popularity of the concept in political and scientific debates on local government and local democracy, there is little agreement about the constituent elements of local autonomy and how to measure it. One of the issues we must address here is the dimensionality of the phenomenon. To show the different issues at stake, the choices to be made, and

the implications these choices have on results, we will use the data of an international research project on local autonomy covering some 39 countries over a time span of 25 years. The aim of this article, it must be kept in mind, is not to argue for a single, best way to create an index of local autonomy, but to make transparent – on the basis of a concrete example – the challenges and choices involved in such an endeavour, and to show what the consequences of these decisions are.

The paper is organized as follows. The next section will look at conceptual and theoretical aspects of local autonomy and the questions to be addressed in the construction of indicators. We will then discuss different possibilities for creating an index of local autonomy. In a following section, we will show to what extent the different possibilities lead to different results. Finally, we will compare the different indicators with others measures of decentralization and local autonomy. The paper ends with a discussion of the results.

Local autonomy

An index is more than a simple variable that can be observed or measured; it is a more abstract or latent variable that has to be constructed. The first stage of the index-construction process involves defining the conceptual domain, what the index attempts to capture or to measure, and how the construct differs from other related measurements (MacKenzie, Podsakoff, and Podsakoff 2011). In the early 1980s, Sartori (1984) insisted that a broad overview of the literature is needed before the phenomenon to which the indicator is applied can be defined and the nature of the construct is specified. We shall therefore look briefly at some of the most relevant theoretical and conceptual writings about local autonomy and discuss the entities concerned.

Local autonomy is probably one of the most fundamental features of local government. The concept is used in a wide range of literature in such fields as local government studies, urban governance, federalism, regionalism, multi-level governance, public administration, and political geography. Local autonomy describes the leeway of local government 'to determine for themselves the mix of local goods of services, as well as local tax rates' (Goldsmith 1995, 229).

Governments at the local level are supposed to possess their own sphere of authority in which the members of the community are involved in accordance with their tastes, preferences, and needs. Local autonomy thus normatively legitimizes local government as a democratic institution situated – territorially – at the local level (Page 1982; Pierre 1990). The existence of an effective 'policy space for local democracy' (Ladner, Keuffer, and Baldersheim 2016, 325) moreover makes it possible to distinguish between locally administered tasks, whereby a local government provides and implements services designed by higher levels of government, and real

local autonomy, where a local government can design services in the way it deems most appropriate.

In the literature, various approaches that refer to the different aspects of local autonomy (Keuffer 2016) can be identified. The legalistic approach mostly focuses on general legal regulations, such as the prior rights of local government (Clark 1984), the right of existence, and the right to decide upon its territorial boundaries. These may be formalized through municipalities' constitutional status, which may afford legal means to protect boundaries against violation. A second type of concern is the formal distribution of competences between different levels of government. There are countries where local governments have a 'general competence' to undertake services, and others where local authorities have to find some form of specific statutory basis for their action. A third set of legal issues concerns the formal basis for central supervision of local authorities. Is supervision limited to the legality of local decisions, or is it extended to reviews of the merits of decisions?

The functional approach focuses on the vertical organization of the public sector in terms of tasks and finances. The assignment of tasks and financial resources to the different levels of government is a crucial issue in decentralization theories (Oates 1990). Economists of the first generation of fiscal decentralization suggested a task-allocation model based on a clear separation of tasks by level (dual-task model) and far-reaching decentralization in order to achieve system efficiency (Buchanan 1950; Tiebout 1956; Musgrave 1959; Oates 1972). In this perspective, autonomous local government enhances the allocative efficiency of services by responding to the particular preferences and circumstances of citizens. The scope of functions for which local government is responsible is therefore a characteristic of local autonomy. The vertical distribution of revenues is also of utmost importance. With respect to revenue, the most important sources are intergovernmental grants and tax revenues (Bergvall et al. 2006). Intergovernmental grants can be either conditional (earmarked) if they are transferred to local governments for specific programmes and subject to strict supervision (Blöchliger 2013), or unconditional (non-earmarked) to be used freely. Consequently, grant funding from higher levels of the government does not necessarily reduce local autonomy. However, it is crucial, according to Oates (1990, 50), that local governments 'raise a significant portion of their own funds' in order to preserve their independence on expenditure decisions and to take their local fiscal decisions carefully. Local autonomy thus also implies that local government is able to decide its own taxes and fees (Oates 2001). And finally, whether local government can freely borrow money also determines local autonomy to a certain extent (Rodden 2002; Swianiewicz 2004).

The organizational approach looks at the way local governments organize themselves to perform their functions. Key is their ability to do this in an effective and efficient way (Reddy, Nemec, and de Vries 2015).

Local governments vary enormously in the way they organize and control decisions of the polity (Dahl and Tufte 1973). In this sense, local autonomy can be considered as the constituent element of the 'two faces of democratic self-determination' (Scharpf 1970) which guarantees political legitimacy. On the input-oriented side, it legitimates political decisions that have been determined through a whole range of procedures, such as public debates, votes or elections (government by the people). On the output-oriented side, it legitimates political choices that respond effectively to citizens' demands and preferences (government for the people). The degree of local autonomy also depends therefore on the administrative ability of a local government to supply public services (Scharpf 1999; Kersting and Vetter 2003).

Lastly, the politics approach of intergovernmental relations focuses on bilateral vertical relations. In the top-down direction, the expression of power is control. As central control is inseparable from local governments' decisions (Marcou 1999), the greater its intensity, the lower the degree of local autonomy. In a broad perspective of intergovernmental relations, central-government control is understood by Goldsmith (2002, 91) as 'setting the rules of the intergovernmental game' and represents the opposite of local autonomy. Formal control can be operated by review of the legality of local decisions with respect to the legal framework. Central control can be equally exercised through various informal means (Goldsmith 2002). Yet prefects and politicians may also play a role in defence of local interests vis-a-vis higher levels of government. According to Page (1991), both direct and indirect channels of access to higher tiers of government exist and offer opportunities for local authorities to shape public services. Indirect representation mainly takes place collectively through corporate lobbying. Direct representation, which offers a greater scope of influence, involves various formal arenas of interaction, of which legislators' backgrounds and the so-called '*cumul des mandats*' are the most important (Page 1991, 56f.).

In sum, these approaches and their underlying debates and definitions reveal the multidimensionality of the concept of local autonomy and the various disciplines involved in its assessment. Local autonomy being too diversified for only one theory to be valid (Mackenzie 1961; Kjellberg 1995), public-law, economics, administrative and political-science theories all highlight different specific dimensions (Schneider 2003). How these legal, functional, organizational, and politics-related aspects can be taken into account for an adequate measurement of local autonomy is the subject of the next section.

Constructing indicators

Some indicators are very simple and have a clear link to what they measure, while others are more complicated and what they are claimed to gauge is

more contestable. In many cases, however, they are used to describe something not directly measurable, usually termed a latent or constructed variable. It falls to researchers to produce the theoretical and conceptual foundations of the indicator and give a meaning to it (MacKenzie, Podsakoff, and Podsakoff 2011).

The quality of an indicator, of course, depends on the way its different components are measured and the way it is constructed. There is no single way to construct an indicator out of a set of variables (components). How it is done depends on the nature of what one wants to measure, on the relation between the different components themselves, and on the relation between the components and the indicator. Without going into too much detail – as is done in the debate about construct validation (see for example Jarvis, MacKenzie, and Podsakoff 2003; Bollen and Lennox 1991) – there are at least four different possibilities:

(1) All components contribute in equal parts to what we attempt to measure. There is no hierarchy between the different components.
(2) All components contribute to what we attempt to measure, but are of different importance.
(3) Some components are more important and can be considered as preconditions for other components. There is a clear hierarchy between the different variables. If these preconditions are not fulfilled, it is very unlikely that conditions on other components will be fulfilled.
(4) Components are mutually exclusive. Any of the main components contributes to a high score on the indicator. There are different ways to achieve the highest score.

With the relative importance and the internal relations between the different components, the construction of the index and its nature also vary. The problem can be reduced to two simple questions: Does the indicator consist of different dimensions, and how are the different variables to be aggregated? In the first case described above, if there is only one underlying dimension implied, an aggregation does not change much (it simply increases the differences), whereas if there are more dimensions implied, a simple aggregation will suffice. In the second case, variables have to be weighted according to their importance. In the third case, one has to make sure that without a high score on the most important components a high score on the indicator cannot be achieved. This can be done through a multiplication with these components ('interaction effect'). In the fourth case, one has to make sure that there are different ways to achieve the highest score. Elaborating on such relations between the different dimensions, one could also

imagine more complex configurations with necessary and sufficient conditions to be fulfilled to achieve some degree of autonomy.

The literature about the construction and validation of indexes addresses the way that variables are related to each other and the problem of dimensionality by distinguishing between formative and reflective indicators (see MacKenzie, Podsakoff, and Podsakoff 2011). In the case of a formative index or construct (latent variable), the measured variables are the causes. A change in one component will result in a change in the overall value of the index. No specific relationship between the different components is demanded. Test statistics such as Cronbach's alpha are not meaningful for the quality of the index (MacKenzie, Podsakoff, and Podsakoff 2011). The variables used for the construction of the index do not have to correlate. In the case of a reflective index, the effective relation between the variables has to be zero. If they are correlated, it is because changes of them are caused by changes of the index. If we control for the index, there are no correlations between the components. The internal consistency of a reflective index can be tested with Cronbach's alpha. Different studies (Jarvis, MacKenzie, and Podsakoff 2003; MacKenzie, Podsakoff, and Jarvis 2005; Petter, Straub, and Rai 2007) suggest that the results can be biased when variables having a formative relationship with an indicator are modelled as having reflective relationships. The majority of the scale development procedures in the literature apply only to constructs with a reflective character. In such cases, a low variable-to-indicator relationship means that the variable in question should be dropped. In the case of a formative indicator, this would mean getting rid of a variable that definitely has an additional value for the quality of the indicator.

MacKenzie, Podsakoff, and Podsakoff (2011, 300) rightly insist that once the construct has been carefully defined, it is important to evaluate whether the construct consists of multiple sub-dimensions and how they relate to the overall construct and to each other. They suggest two criteria for evaluating whether a construct (indicator) is multidimensional. The first asks to what extent the characteristics not only have a common theme but are really distinct from each other, and the second asks whether dropping one of them significantly restricts the construct (MacKenzie, Podsakoff, and Podsakoff 2011: 301). In our case, we can argue that, for example, the legal status of municipalities is in fact distinct from the scope of tasks they are responsible for. They can have a solid legal status but only a limited number of tasks, or a broad responsibility but no solid legal status. Dropping one of the two variables would restrict the reach of the indicator. From a theoretical point of view, it therefore makes sense to consider the construct/indicator as multidimensional. Empirically, a correlation between the two variables/dimensions does not give us the information needed to tell whether we are measuring only one or two dimensions. If the correlation is very high, the two variables might in fact measure the same thing, but it could also be the case that it is

rather a coincidence that in the sample under scrutiny we find a correlation, or that a deviant combination (strong legal status and no tasks) hardly exists.

If the construct is unidimensional one might indeed wonder whether all variables are needed to measure it; if the construct is multidimensional then the question arises of how the dimensions are related to each other and how they are linked to the construct. Do the dimensions define the construct or are they rather a manifestation of the construct? If the dimensions are defining characteristics of the indicator and a change in one dimension would influence the overall value of the indicator, we are again dealing with a formative indicator (see MacKenzie, Podsakoff, and Podsakoff 2011: 301). In the case of a reflective indicator, the construct exists at a deeper level and a change in the indicator would go hand in hand with a change in all dimensions. To this has to be added the question of how the different dimensions are to be aggregated. Can they simply be added, do they have to be multiplied, or is there an even more complex structure of necessary and sufficient conditions to be taken into account? In some cases, a multiplication of the two variables might yield a better result. In the case of financial and functional autonomy, it might be argued that finances without any task or tasks without any financial autonomy might lead to no autonomy at all. In such a case, only some degree of autonomy in both dimensions leads to autonomous municipalities. If there is no autonomy in at least one dimension, municipalities have no autonomy at all.[1]

Creating a new Local Autonomy Index

Existing indicators

Recently, attempts to measure the degree of local autonomy/decentralization systematically in a large number of countries and subnational tiers and to create respective indicators have become quite prolific (Sellers and Lidström 2007; Wolman et al. 2010; Ivanyna and Shah 2014; Do Vale 2015; Hooghe et al. 2016). The dimensions used to measure the degree of local autonomy and the way they have been aggregated, however, vary considerably.

Comparing local autonomy across the US states, Wolman et al. (2010) define it in terms of three dimensions: local government importance, local government discretion, and local government capacity. In studies that aim to measure the degree of decentralization of government or the degree of closeness of the government to the people (Ivanyna and Shah 2014), a distinction is made between 'political', 'administrative', and 'fiscal' dimensions of decentralization. Examining variations among regional authorities across states, Hooghe et al. (2016) distinguish between elements concerning the extent to which regional units have authority over those who live on their territory (self-rule), and the influence of regional units to shape national decision making (shared-rule).

By now also a considerable amount of data has been produced by the Organisation for Economic Co-operation and Development (OECD) and the World Bank (WB). The problem with these sources is that they mainly deal with local expenditure, tax-raising powers and transfers, and that they do not capture other aspects of local-government autonomy. Thus, a systematic and comprehensive report on the degree of local autonomy that encompasses all the different dimensions of local autonomy, covers a large number of countries and outlines at least the most recent developments, is lacking.

The Local Autonomy Index project

The Local Autonomy Index (LAI) project started with a call for tenders issued by the European Commission's Directorate-General for Regional and Urban Policy, which led to a mandate conducted from October 2014 to November 2015.[2] The mandate was to create a comprehensive index of local autonomy in European countries over the period from 1990 to 2014. The index was to provide a basis on which to analyse and report changes in the extent of decentralization in the countries under scrutiny. The measurement of decentralization was to go beyond recording the share of funds managed by local authorities and also to capture the extent to which local authorities have a say in how these funds are spent. The project covered 39 countries: all 28 EU member states together with the 3 European Economic Area (EEA) countries (Norway, Iceland, and Liechtenstein) plus Switzerland, a member of the European Free Trade Association (EFTA). Additionally, Albania, Macedonia, Moldova, Georgia, Serbia, Turkey, and Ukraine were included.

To produce comprehensive and comparable data for a large number of countries over a long period of time is quite a challenge. The data has to be detailed enough to capture the differences, and the variables and categories of measurement have to be relevant, applicable and similarly meaningful in all the countries involved. In some countries, for example, it is not even simple to decide which state level has to be taken into account, and in some countries not all local units enjoy the same degree of autonomy (Ladner, Keuffer, and Baldersheim 2016).

To accomplish the task in such a short lapse of time, we had to bring together a large team of researchers familiar with the situation in the respective countries and to ensure that they applied the methodology that was developed in a similar manner. Here, the COST action IS1207 Local Public Sector Reform led by Sabine Kuhlmann and Geert Bouckaert proved to be particularly helpful to complete our network and to coordinate the research activities.

To diminish the workload and to streamline the coding, we split the countries into different groups and assigned country-group coordinators.

Not only did this guarantee that regional characteristics would be covered more adequately, but the coordinators also played an important role in improving the quality of the different variables of measurement. They were also involved in the drafting of the coding instructions from the beginning of the project in order to avoid the reliability and validity risks highlighted in the literature regarding expert judgements (Steenbergen and Marks 2007). Lastly, they played a central role in the coordination of the country experts who were requested to code their countries for each of the 25 years, starting with the most recent year (2014) and working backward (1990), on the basis of a coding scheme.[3]

Measurement of the different characteristics (11 variables)

Completely in line with the most important aspects of local autonomy discussed in the literature, the measurement of local autonomy was based on a code book containing 11 variables. Two of the variables (PS and EPD) consisted of 12 sub-variables. For each variable, clear indications regarding the meaning of the categories were given (Ladner, Keuffer, and Baldersheim 2016).

Institutional depth (ID): The extent to which local government is formally autonomous and has a choice regarding which tasks to perform. Scores range from '0 = local authorities can only perform mandated tasks' to '3 = local authorities are free to take on any new tasks (residual competences) not assigned to other levels of government'.

Policy scope (PS): Range of functions (tasks) where local government is effectively involved in the delivery of the services, be it through own financial resources and/or through own staff. We chose the main public policies that European local governments are responsible for – primary education, social assistance, primary health services, land use, public transport, housing, police, and caring functions (Marcou 2010; Loughlin, Hendriks, and Lidström 2011; Moreno 2012) – in order to capture differences across countries. The score 0 stands for 'not at all', 0.5 for partly and 1 for fully responsible for each of the following 12 tasks: construction and/or the maintenance of school buildings; teachers' employment and payment; providing poverty relief; other social security/protection services; construction and/or the maintenance of clinics or health centres (not hospitals or specialized health services); doctors' employment and payment; administering building permits; administering zoning; public transport services; housing and town development; police; delivering caring functions.

Effective political discretion (EPD): The extent to which local government has real influence (can decide on service aspects) over these functions. No (0), some (0.5) or real authoritative decision making (1) for each of the following 12 service aspects: number and location of schools; teachers' employment and payment; an individual receiving financial relief or not; the level of

assistance a person receives; the construction and/or maintenance of health centres (not hospitals or specialized health services); the organization and functioning of specialized health centres; building permits; zoning; range and level of public transport services offered; housing and town development; public order police services and traffic police services; the level of caring functions offered.[4]

Fiscal autonomy (FA): The extent to which local government can independently tax its population. Scores range from '0 = local authorities set base or rate of minor taxes' to '4 = local authorities set base and rate of more than one major tax (personal income, corporate, value added, property or sales tax)'.

Financial transfer system (FTS): The proportion of unconditional financial transfers to total financial transfers received by the local government. Scores range from '0 = conditional transfers are dominant (unconditional = 0–40% of total transfers)' to '3 = nearly all transfers are unconditional (unconditional = 80–100%)'.

Financial self-reliance (FSR): The proportion of local government revenues derived from own/local sources (taxes, fees, charges). Scores range from: '0 = own sources yield less than 10% of total revenues' to '3 = own sources yield more than 50%'.

Borrowing autonomy (BA): The extent to which local government can borrow. Scores range from '0 = local authorities cannot borrow' to '3 = local authorities may borrow without restriction imposed by higher-level authorities'.

Organisational autonomy (OA): The extent to which local government is free to decide on its own organization and electoral system. Scores range from '0 = local executives are appointed by higher-level authorities and local authorities cannot determine core elements of their political systems (electoral districts, number of seats, electoral system)' to '4 = executives are elected by the citizens or the council and the municipality may decide some elements of the electoral system, and local authorities hire their own staff, fix the salary of their employees, choose their organizational structure and establish legal entities and municipal enterprises'.

Legal protection (LP): Existence of constitutional or legal means to assert local autonomy. Scores range from '0 = no legal remedy for the protection of local autonomy exists' to '3 = remedies of constitutional clauses or statutory regulations and recourse to the judicial system, plus other means that protect local autonomy, such as listing of all municipalities in the constitution or the impossibility to force them to merge'.

Administrative supervision (AS): Unobtrusive administrative supervision of local government. Scores range from '0 = administrative supervision reviews legality as well as merits/expediency of municipal decisions' to '3 = there is very limited administrative supervision'.

Central or regional access (CRA): The extent to which local authorities are consulted to influence higher level governments' policy-making. Scores range from '0 = local authorities are never consulted by higher level governments and there are no formal mechanisms of representation' to '3 = local authorities are either consulted or have access to higher-level decision-making through formal representation; and substantial influence'.

The first eight variables measure the degree of 'self-rule' of local government (e.g. Elazar 1987), while the last three measures what we termed 'interactive rule', the way the vertical relation is organized (Ladner, Keuffer, and Baldersheim 2016, 325).

Weighting and dimensionality

Following the debate about the creation of indicators, the next questions to address concern the importance of the different variables measured and the internal structure of the data gathered. To what extent do the variables measure the same or different elements of local autonomy? The theoretical debate suggests that local autonomy has different faces, but we do not measure all the different faces the same way. Four variables measure financial aspects, for example, but only one variable measures the legal status of the municipalities, and the range of the different variables is 0 to 3 in some cases and 0 to 4 in others.

If we simply add up the different variables to obtain an overall index of local autonomy, those aspects with a higher range and with a higher number of variables will play a more important role. Implicitly our measurement thus gives more weight to financial aspects. This might be correct, but it is not explicitly made visible. Or in other words: if two variables measure absolutely the same element, they might incorrectly inflate the importance of this element or they might correctly give more weight to the element measured by these variables. Which version is right has to be decided on the basis of theoretical consideration and empirical insight. Whereas for the different ranges, the procedure is very simple. We recode all variables to a scale reaching from 0 to 100.

According to our understanding of local autonomy, the deciding element of local autonomy is the question of whether the provision of important tasks and services falls to local governments rather than to higher levels of the state. The more it does, the more important they are. In terms of autonomy, a directly related question is whether local governments have a say in how these tasks and services are provided and, very importantly, whether they have financial resources and possibilities to provide them independently. Another important element is the legal status of municipalities. Of course, one might argue that a guarantee of existence is the most crucial element of autonomy, but such a legalistic perspective tells

us very little about the practice ('law in use'). We therefore consider this guarantee to be of lesser importance than the financial and functional elements of local autonomy. Additionally, we consider the power of municipalities to organize their political system and their administration according to their needs and preferences to be another significant element of local autonomy. Lastly, we consider vertical relations with higher levels of state as important elements of local autonomy in both directions: 'top-down' (supervision and the guiding of activities through transfers in the form of earmarked grants), and 'bottom-up' (the influence local government has on political decisions at a higher level). Based on this understanding of local autonomy, we suggest combining the 11 variables into 7 dimensions of local autonomy. These dimensions are:

(1) Political discretion: the formal distribution of power and effective decision-making competences with respect to service delivery (= institutional depth + effective political discretion);
(2) Policy scope: the scope of services for which local governments are responsible (= policy scope);
(3) Financial autonomy: the financial resources available locally and the power to decide on their sources (= fiscal autonomy + financial self-reliance + borrowing autonomy);
(4) Organizational autonomy: the free organization of the local political system and the local administration (= organizational autonomy);
(5) Legal autonomy: the legal status and protection of local governments (= legal protection);
(6) Non-interference: the extent of liberty allowed by higher levels of government (= financial transfer system + administrative supervision);
(7) Access: the degree of influence of local governments over political decisions at higher levels of government (= central or regional access).

Our theoretical arguments are – at least partially – corroborated by the data we gathered (see Table 1). A factor analysis including each year (1990–2014) for all 39 countries ($N = 966$) produces – if the criteria is eigenvalue greater than 1 – the following 3 factors: a first factor combining policy scope and effective political discretion as well as institutional depth, a second factor with the financial variables (except borrowing autonomy) and central and regional access, and a third factor with the remaining variables. If we look at a forced seven-factor solution, organizational autonomy, legal autonomy and central or regional access load on a single factor, whereas four pairs of variables – policy scope and effective political discretion, institutional depth and borrowing autonomy, fiscal autonomy and financial self-reliance, financial transfer system and administrative supervision – load on another factor. The last two pairs confirm our theoretical expectations, whereas for the first two

Table 1. Factor analysis of the 11 variables used to measure local autonomy.

	3 factors (eigenvalue > 1)			7 factors (forced solution)						
	1	2	3	1	2	3	4	5	6	7
Institutional depth	.590	.305	.329	.452	−.028	.577	.141	.133	.405	−.035
Policy scope	.892	.248	.071	.846	.234	.100	.079	.176	.252	−.014
Effective political discretion	.901	−.034	.037	.928	−.024	.077	.068	.109	.019	.072
Fiscal autonomy	.261	.687	.075	.243	.897	.009	.024	.120	.162	.071
Financial transfer system	.152	.666	−.028	.210	.292	.154	.802	−.184	.021	−.177
Financial self-reliance	−.103	.896	.020	−.127	.774	.360	.260	−.058	.068	−.194
Borrowing autonomy	.169	.460	.549	.070	.238	.853	.063	.164	.112	.174
Organizational autonomy	.459	.023	.565	.281	.083	.209	−.009	.874	.057	.076
Legal protection	.000	−.263	.749	.046	−.045	.118	−.014	.091	.023	.967
Administrative supervision	.073	.183	.642	−.026	−.056	−.003	.716	.508	.207	.255
Central or regional access	.394	.441	.310	.179	.198	.182	.098	.069	.908	.035

Notes: Extraction method: Principal component, Varimax, $N = 966$ (Albania, Latvia, Malta, Romania, and Ukraine were not independent in 1990 and the data for these countries therefore starts in 1991, 1992 or 1993; For the other 34 countries, observations for 25 years (1990–2014) are taken into account).

we suggested for theoretical concerns combining institutional depth with effective political discretion, separating policy scope from effective political discretion and combining borrowing autonomy with the two financial variables (fiscal autonomy and financial self-reliance).

As soon as we combine two or more variables to a new variable, the relation between them becomes important, as we have seen. Are they all of equal importance and can they simply be added or do we need more sophisticated methods of aggregation? At this stage, we have to answer this question for three of the seven dimensions. In all three cases, we believe that a simple addition of the values is reasonable and no another mathematical function is needed to combine them. Concerning the weight of the different variables to combine, some weighting is needed in two of the three cases. We believe that effective political discretion measured through the 11 variables designating concrete policies should be given more weight than institutional depth, which is a more general statement of whether municipalities, in principle, have the power to take up new tasks on their own. Similarly, we believe that financial autonomy and financial self-reliance are more important than borrowing autonomy. For the dimension of non-interference, we suggest considering both variables as of equal importance. This leads to the following construction of the three dimensions consisting of more than one variable:

- Political discretion = (1 * institutional depth + 3 * effective political discretion)/4
- Financial autonomy = (3 * fiscal autonomy + 3 * financial self-reliance + 1 * borrowing autonomy)/7
- Non-interference = (financial transfer system + administrative supervision)/2.

The weight given to the different variables is purely arbitrary and reflects our understanding of the importance of the different elements of local autonomy. Again, of course, we had to make sure that their range does not differ from the range of the other dimensions.

Aggregation and construction of the index

Before we construct our index, we have to make sure that we consider all relevant aspects of local autonomy; in other words, we must test the validity of the content. Content validity assesses the degree to which an indicator captures the content of the measured concept (Adcock and Collier 2001, 537). This can be done at the beginning of a research project, but quite often researchers lack the necessary insight when they start a project. Content validity 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). For this purpose, some sort of a table or figure presenting the different aspects or dimensions taken into account proves very helpful (see Figure 1).

Our triangle of local autonomy clearly shows that the index takes legal, functional, financial, organizational, and vertical aspects of local autonomy into account and therefore covers the most important elements discussed in the literature. Incidentally, these elements can also be found in the European Charter of Local Self-Government.

The triangle also shows the importance we give to the different dimensions. At the bottom are the two most important dimensions, effective political discretion and financial autonomy (3). Above them we place policy scope, which is closely related to political discretion, on the right and organizational autonomy on the side of financial autonomy (2). At the top, we have access to higher level decisions and non-interference by higher levels and legal autonomy (1). Legal autonomy, financial autonomy, and political discretion form the three cornerstones of local autonomy.

The importance given to the different dimensions – from the construction side – is again arbitrary and based on our understanding of the literature and our practical experience. But to some extent, the weighting might also depend on the focus of research: a researcher interested in intergovernmental relations might be more likely to put the emphasis on the legal and vertical aspects, whereas for the purpose of comparing local authorities' room for decision making or the quality of local democracy, the presentation in the figure is more adequate.

Very similar to what we did while creating the compound dimensions, we restricted ourselves to a simple addition of weighted variables/dimensions. The weighted overall index of local autonomy (LAIw) can thus be presented

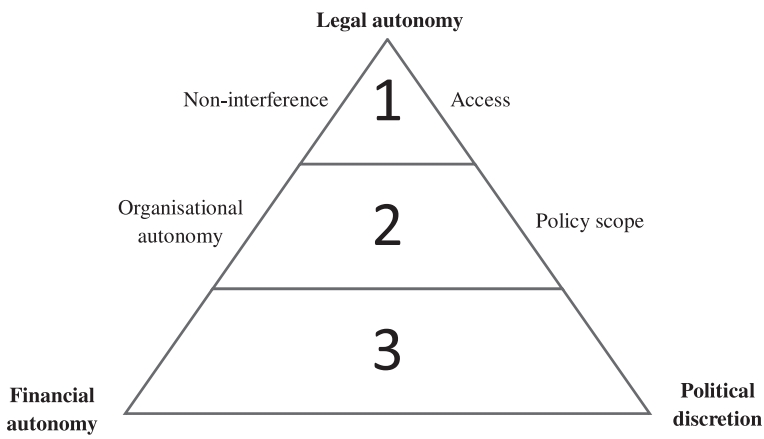

Figure 1. The triangle of local autonomy.

as follows:

$$\text{LAIw} = \begin{pmatrix} 1 \text{ *Dw\_legal autonomy} + 3 \text{ *Dw\_political discretion} \\ +2*\text{Dw\_policy autonomy} +3*\text{Dw\_financialautonomy} \\ +2*\text{Dw\_organisational autonomy} + 1 \text{ *Dw\_non - interference} \\ +1*\text{Dw\_access} \end{pmatrix} /13.$$

The advantage of this form of presentation is that the quality of the index and the importance of its components become directly visible, and we get a better understanding of what is truly being measured. In a next step, nevertheless, we might want to know whether our indicator also yields meaningful results.

Empirical results

We have seen so far that the construction of an index can go far beyond a simple aggregation of variables measured. The question remains: to what extent does a more sophisticated and thoughtful index construction lead to different and better results? This can now easily be answered on the basis of our data. We will look at three differently constructed indicators:

- The first (LA) is a simple aggregation of the 11 variables (11V);
- The second is a simple aggregation of the seven dimensions without any weighting (LAInw/moderate);
- The third is the weighted index of local autonomy presented above (LAIw).

Looking at the local autonomy scores for the different countries, measured by the mean values over the whole time period 1990 to 2014, there are no fundamental differences between the three indicators (see Table 2). We find more or less the same countries at the top and at the bottom of the list. This is also corroborated by the correlations between the three indicators. All three indicators correlate almost perfectly (Pearson's corr. >0.95, $p < .001$).

There are, however, slight differences as far as the rankings of the countries are concerned. This is not completely unimportant. When the moderate weighting solution (column in the middle) is used, Estonia joins the group of countries with the highest level of autonomy (> 70) and Poland ranks second. Lithuania and Hungary find themselves in the second-highest group when we rely again on the moderate solution, but in a lower group when the other two indicators are used. Only when our suggested weighed index is used do all the Nordic countries find themselves in the group with the highest level of local autonomy, together with Germany, Switzerland, Liechtenstein, and Poland.

The differences in the rankings show that the way we construct the index matters. Since we use the same data and our choices regarding aggregation diverge only moderately, the differences are not very important. The way these differences emerge is easy to explain: they depend on the weight given

Table 2. Different country rankings depending on the index used.

Country	LA (11V)	Country	LAI (moderate)	Country	LAI (weighted)
Switzerland	78.9	Switzerland	81.3	Switzerland	79.1
Finland	78.5	Poland	76.7	Finland	78.3
Iceland	78.0	Finland	76.5	Iceland	76.1
Sweden	77.7	Iceland	75.6	Denmark	74.8
Liechtenstein	74.6	Denmark	72.8	Sweden	74.7
Germany	73.3	Germany	72.4	Poland	73.6
Denmark	72.5	Sweden	72.4	Germany	73.6
Poland	72.3	Liechtenstein	71.5	Liechtenstein	72.3
		Estonia	70.9	*Norway*	71.4
France	69.6	Austria	69.1	Estonia	66.3
Norway	69.0	France	67.9	France	65.4
Austria	67.8	Norway	66.6	Austria	63.3
Estonia	65.9	Czech Republic	66.1	Czech Republic	62.7
Spain	65.8	Hungary	63.7	Spain	61.2
Czech Republic	65.2	Lithuania	62.2	*Italy*	61.1
Luxembourg	63.1	Spain	62.2		
Portugal	62.5	*Italy*	61.3		
Hungary	62.3	*Portugal*	60.7		
Italy	59.4	Latvia	59.6	Hungary	59.6
Lithuania	57.8	Bulgaria	59.2	Luxembourg	59.3
Belgium	57.2	Luxembourg	58.6	Belgium	59.0
Slovakia	56.1	Netherlands	58.4	Lithuania	58.9
Netherlands	54.6	Slovakia	57.2	Netherlands	57.4
Serbia	54.0	Belgium	56.2	Portugal	56.6
Latvia	53.7	Serbia	56.2	Serbia	55.3
Greece	52.8	Slovenia	52.1	Latvia	54.6
Bulgaria	52.7	Romania	50.9	Bulgaria	54.3
				Slovakia	52.3
				Romania	50.3
Croatia	49.3	United Kingdom	50.0	Croatia	47.3
United Kingdom	47.4	Greece	49.5	Slovenia	47.3
Turkey	47.0	Ukraine	47.9	United Kingdom	46.6
Romania	46.9	Malta	46.8	Ukraine	46.2
Malta	46.5	Macedonia	45.6	Macedonia	45.3
Slovenia	46.2	Croatia	45.3	Greece	44.0
Ukraine	42.8	Turkey	43.8	Cyprus	40.6
Cyprus	41.9	Cyprus	41.1	Turkey	40.1
Macedonia	40.9				
Ireland	36.2	Albania	38.8	Albania	36.9
Albania	35.8	Ireland	31.2	Ireland	35.0
Georgia	29.3	Georgia	28.2	Malta	34.1
Moldova	23.7	Moldova	24.5	Georgia	30.8
				Moldova	27.8

Notes: Mean values 1990–2014. For Albania, Latvia, Malta, Romania, and Ukraine there is no data for 1990; the first years of measurement are 1992, 1991, 1993, 1992, and 1991, respectively.

implicitly or explicitly to the various aspects of local autonomy. In our first solution, where we simply added the 11 variables, financial aspects play a quite important role since they are measured through the 4 variables fiscal autonomy, financial self-reliance, financial transfer system and borrowing autonomy. In our second, 'moderate' solution, we attached the same importance to all seven dimensions, financial autonomy being no more important than legal or organizational autonomy. Since we have two dimensions measuring vertical aspects (non-interferences and access), they are more important than financial

autonomy, which includes financial self-reliance, fiscal autonomy, and borrowing autonomy. The third, weighted solution, corrects what might be seen as a distortion and gives again more weight to financial and functional aspects compared to the other elements of local autonomy.

Interesting to note, finally, are the internal and empirical similarities between the 11-variables solution and the weighted index. The reason for this is quite simple. Since financial and functional aspects are considered to be important and the different elements they stand for repeatedly discussed in the literature, we attempted to measure them in a more differentiated manner in the first place. Our implicit weighting through the selection of the variables comes close to our theory-based explicit weighting in the final construction of the indicator. Since research is based on theory and clear conceptual grounds, we suggest relying on our third, weighted solution.

As we have said, however, the emphasis of this paper is not to promote a single best indicator of local autonomy, but rather to show the challenges that must be met and the choices that must be made while constructing such an index. We strongly suggest trying out other strategies to produce an overall measurement of local autonomy. The data gathered in our project is available[5] and offers unlimited possibilities for combining the different variables and constructing other indicators. The relevance of an index can only be evaluated when it is used in theoretical or empirical research, or compared with similar measures, as we will do in the next section.

Convergent validity

Beyond conceptual and empirical considerations, there is an additional strategy for controlling the quality of a given indicator (Schakel 2008). It is commonly discussed under the heading convergent validity. Convergent validity assesses whether a given indicator is empirically associated with other indicators. It involves comparing alternative measures of the same concept or comparing measures of different concepts (Ray 2007, 12).

The measurements of local autonomy we suggest should converge with other indicators measuring local autonomy or similar aspects, such as the various measurements of decentralization. To test this, we can, for example, analyse to what extent they correlate with other indicators across a given set of cases. Apart from merely technical problems of finding comparable data for the same countries, there is a more general difficulty attached to this procedure. If there is no correlation at all, we cannot know whether our measurement measures the same phenomenon that other indicators claim to measure. If the correlation is very high, we are likely to be measuring the same thing, and must prove why our indicator is necessary, more innovative or better. Ideally, we would find a quite strong correlation which still leaves part of the variance unexplained:

> In addition to showing that the indicators provide an accurate representation of the focal construct, and that they behave in a manner that is consistent with the nomological network, it is also important to show that these indicators are distinguishable from the indicators of other constructs. (MacKenzie, Podsakoff, and Podsakoff 2011, 323–324).

Table 3 shows that all indicators correlate significantly with almost all of the OECD and Ivanyna and Shah (2014) indicators of financial decentralization and local autonomy. The weighed indicator (LAIw) shows the strongest correlations in most of the cases, but the correlations are far from perfect. We shall take this as an additional argument in favour of this indicator.

The final possibility for testing the quality of an indicator that we want to present in this paper addresses the questions of whether an indicator really has an added value compared to its components (Edwards 2001). If it is assumed that a fairly good correlation with other indicators is a good sign, showing that the new indicator is not very far off-target, then we can test whether the index correlates more strongly than its components with

Table 3. Correlation of the different autonomy indexes with OECD and Ivanyna and Shah's measures of decentralization.

	LA_Index_V11_10_14	LAI_Index_D7_10_14	LAI_Index_D7w_10_14	*N*
OECD_LG_D%tot_2014	.496*	.531**	.602**	24
OECD_LG_R%tot_2014	.687**	.639**	.707**	24
OECD_LG_TaxAut1%tot_2014	.617**	.560**	.629**	23
OECD_NonEar2_2010	.570	.545	.637*	12
Ivanyna and Shah_LG_RI	.288	.310	.388*	38
Ivanyna and Shah_LG_SE	.622**	.606**	.645**	38
Ivanyna and Shah _FDI	.615**	.534**	.580**	38
Ivanyna and Shah _PDI	.356*	.357*	.324*	38
Ivanyna and Shah _ADI	.322*	.378*	.441**	38
Ivanyna and Shah _DI	.567**	.536**	.602**	38
Ivanyna and Shah _GCI	.620**	.589**	.643**	38

*Significant at .05 level, **Significant at .01 level.

Sources: Ivanyna and Shah (2014); OECD fiscal decentralization database: http://www.oecd.org/ctp/federalism/fiscal-decentralisation-database.htm.Operationalisation (OECD_LG_D%tot_2014: Consolidated local government expenditure as percentage of total general government expenditure in 2014; OECD_LG_R%tot_2014: Consolidated local government revenue as percentage of total general government revenue in 2014; OECD_LG_TaxAut1%tot_2014: Local government tax revenue as percentage of total general government tax revenue in 2014; OECD_NonEar2_2010: Local government non-earmarked grants revenue as a percentage of GDP in 2010; Ivanyna and Shah _LG_RI: The relative importance of local governments (measured by share of LG expenditures in consolidated general government expenditures for all orders of government); Ivanyna and Shah _LG_SE: Local government security of existence (measured by LG independence); Ivanyna and Shah _FDI: Local government fiscal autonomy (measured through LG vertical fiscal gap, LG taxation autonomy, LG unconditional transfers, LG Expenditure Autonomy and LG borrowing freedom); Ivanyna and Shah _PDI: Political decentralization (measured through LG legislative election, LG executive election and direct democracy provisions); Ivanyna and Shah _ADI: Administrative Decentralization (captured through LG HR policies and LG employment); Ivanyna and Shah _DI: The aggregate Decentralization Index (measured through the relative importance of LG, the security of existence of LG and fiscal, political and administrative indexes; Ivanyna and Shah _GCI: Government Closeness Index (with a complex weighting procedure)).

Table 4. Correlation of the LAIw and its components with OECD and Ivanyna and Shah's measures.

	OECD_LG_R% tot_2014	OECD_LG_TaxAut1% tot_2014	Ivanyna and Shah_DI
LAI_Index_D7w_10_14	.707**	.629**	.602**
D7_legalautonomy10_14s	−.255	−.339	−.303
D7_politicaldiscretion10_14s	.473*	.451*	.360*
D7_policyscope10_14s	.539**	.541**	.565**
D7_financialautonomy10_14s	.500*	.465*	.476**
D7_organisationalautonomy10_14s	.447*	.411	.451**
D7_noninterference10_14s	.461*	.424*	.323*
D7_access10_14s	.342	.338	.356*
N=	24	23	38

*Significant at .05 level, **Significant at .01 level.

similar indicators. In fact, the LAIw is more closely related to the OECD data measuring the percentage of local government revenue compared to total government revenue and the OECD indicator for tax autonomy, as well as to Ivanyna and Shah's (2014) aggregated decentralization index (see Table 4).

Taken all together, there are thus strong arguments in favour of the weighted indicator (LAIw). Further analyses should therefore be pursued with this indicator and the seven dimensions we used for its construction. However, we feel it is important to bear in mind that some decisive choices underlie this indicator, allocating different weights to the different variables used. We favour financial and policy-related elements of local autonomy, with legal and vertical aspects playing a lesser role. There might arguably be different choices. We do not claim to propose a single best way, but it seems to us important to make choices transparent and to give insight into the possibilities and challenges when it comes to the creation of an index. We also believe that our index goes beyond what is measured by financial data to include the question of whether local governments have a say in how the funds are spent and how they choose to organize themselves.

Conclusion and discussion

Creating an index to measure a complex phenomenon is quite a challenging endeavour that entails a series of choices a researcher has to make. These choices are not always visible once the results are presented, and they might even have an impact on the final results. Using a concrete example, the creation of an index of local autonomy, we tried to give some insight into the index construction process and the different issues at stake. In a first step, we have to make sure that the different variables have comparable scales. If their scales vary too much, variables with larger scales can receive an unintended weight when the indicator is constructed. Standardization of all variables at the very beginning is thus advisable. In a second step, we have to consider the importance of the different variables or components of the index. Not all elements are of equal

importance and it is crucial that the most important variables are weighted accordingly. Sometimes different variables measuring the same thing are available to us. In this case, it is advisable to combine the variables, since otherwise the aspect concerned can become too important unintendedly. Hence the question of weight and weighting has to be addressed again, and decisions have to be made transparent. Ideally, these decisions are based on theoretical considerations. And lastly, we have to solve the problem of aggregation. Quite often we simply add up the different (standardized and weighed) components. More sophisticated methods of using the information of the different components are theoretically too ambitious. Whether the index consists of one or of more than one dimensions is also something that has to be tested. Here, theoretical concerns are important again. If an indicator consists of different dimensions, further analysis should not neglect this multidimensionality.

In the LAI project conducted in the years 2014/2015, we followed the method described above. Our endeavour started with a thorough overview of the relevant literature and existing studies in the field. This – together with the expertise of the core team of the project – allowed us to select the most important variables to measure the extent of local autonomy in the different countries. The selection of the variables, as we realized later on in the project, represented quite nicely the importance of the different characteristics of local autonomy. Nevertheless, our approach was to some extent influenced by the view of political scientists. Scholars of public and constitutional law would, most probably, have put more emphasis on variables representing legal aspects of local autonomy.

To create the index, we chose a two-step procedure. The 11 variables measured were reduced on the basis of theoretical and empirical considerations to seven dimension of local autonomy (political discretion, policy scope, financial autonomy, organizational autonomy, non-interference, access, and legal autonomy). The seven dimensions were then aggregated to a single index of local autonomy. For both steps, we applied a moderate weighting of the components in line with their importance in the literature and according to our judgment. Our index of local autonomy was tested against other methods to aggregate the data. We are convinced that our index measures local autonomy more adequately. First, it is based on financial and functional aspects and also includes organizational, legal and vertical aspects considered important in the literature (content validity); second, while going further than fiscal decentralization indicators it shows the strongest correlations with other measures of decentralization (convergent validity); third, it has an added value compared to its seven components.

Doubtless, there are other ways to construct such indicators and we hope that this paper together with the data we gathered and are making available will enhance similar attempts. We have endeavoured to hint at some of the challenges and choice ones is going to be confronted with. We believe that

the real contribution of such an index can only be assessed when it is used and applied in research, whether to rank countries or to compare different types of countries, or whether when attempting to test the theoretically expected influence of local autonomy on other variables, for example the quality of local democracy or economic development. Whether it will be the index of local autonomy, some of the dimensions we identified, or only a single variable that proves useful is of lesser importance. We hope that our project will contribute to further research in a fascinating field of interest.

Notes

1. In the case of two binary variables (1, 0), multiplication of the different configuration leads to the results 0, 0, 0, 1 whereas addition leads to 0, 1, 1, 2.
2. The Leading House of the project was the Graduate Institute of Public Administration (IDHEAP) at the University of Lausanne. Coordination of the project, compilation and control of the data and the final report as well as administration and financial matters were dealt with at the IDHEAP. Co-applicant for the project, country group coordinator, and country expert was Harald Baldersheim. The other country group experts were Pawel Swianiewicz, Nikos Hlepas, Kristof Steyvers, and Carmen Navarro.
3. For more details about the coding scheme and the methodology of the LAI project, see Ladner, Keuffer, and Baldersheim (2016).
4. These aspects are related to the same public policies but different items as for policy scope, in order to capture variations on decisional competences among countries.
5. See http://local-autonomy.andreasladner.ch/

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