The puzzle of complex vs simple intergovernmental equalization system design. The case of expenditure needs indicators in Italy

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Abstract

There is a common consensus that fiscal equalization within local governments should take into account both fiscal capacity and expenditure needs. The equalization of expenditure needs introduces significant complexity which may increase monitoring costs and the scope for discretion and disagreement amongst policy makers, thus undermining ex ante implementability, ex-post enforceability and increasing incentives for rent-seeking behaviour. However, the existing literature does not provide any guidance on how to solve this trade-off.

This paper follows a positive approach and investigates the way the collective decision mechanisms affects the adoption of complex vs. simple fiscal rules through the analysis of the recent Italian experience on the design of equalization grants at municipal level. We show that majority voting cannot explain the choice of the complex equalization rule adopted in Italy and discuss the factors that may have affected the outcome of the collective choice process. In particular, we emphasize the role of complexity in favouring rent-seeking behaviour by local politicians and the role of the bargaining power of different institutional actors involved in the decision-making process.

Keywords: Equalization; Expenditure needs; Complexity; Fiscal rules

JEL classification: H72; H77
1. Introduction

The case for fiscal equalization rests on both equity and efficiency grounds. From the point of view of equity the central aim of an equalization transfer is to enable sub-national jurisdictions with different abilities to raise revenues from the tax bases assigned to the lower-level government to provide comparable levels of services (Vaillancourt and Bird, 2005). From the point of view of efficiency the aim is to avoid that differences of fiscal resources across states give rise to fiscally induced migration of productive factors. Differences in fiscal benefits can arises both as from the uneven distribution of tax bases or from the uneven distribution of expenditure need. As a consequence, there is a common consensus that fiscal equalization within local governments should take into account both fiscal capacity and fiscal need. The equalization of expenditure needs however introduces significant complexity as differences in needs among territorial jurisdictions may arise from differences in demographic profiles, in geographical and climatic conditions, in the incidence of poverty, in production costs and factor prices, and so on.

In a recent review of international practices Shah (2012) shows that despite these difficulties numerous attempts have been made to measure expenditure needs. Broadly, these attempts can be classified into two main categories: a) ad hoc determination of expenditure needs; b) representative expenditure system (RES). Both approaches usually results in complex calculation. In particular the RES approach, which mimics the representative tax system (RTS) used to equalize fiscal capacity, requires the disaggregation of sub-national government expenditure into major functional categories (e.g. health services, education, transportation and communication), the computation of total expenditures by each jurisdiction for each function, the identification of the relative need/cost factors, the assignment of relative weights for each factor (using direct imputation methods or regression analysis).

The main rationale for complexity is the demand for accuracy: if equalization aims at filling net fiscal benefits, both on equity and efficiency ground, all relevant differences across jurisdictions must be properly taken into account and properly weighted.

The complexity required to achieve an accurate equalization of expenditure needs brings about a series of costs. The most obvious are the cost of collecting the required data and the difficulties in determining the weights for need/cost factors. The Australian experience, where the Commonwealth Grants Commission (CGC) determines the relative expenditure needs for 41 state-local expenditures using several hundred factors needs, illustrates quite well these practical difficulties (Petchey and Levchenkova 2007).

Beside administrative costs, the complexity of equalization rules may also produce efficiency losses because of moral-hazard problems. Schuknecht (2004) has argued that a complex rule

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1 For a review of international practices in measuring local government expenditure needs see also Kim and Lotz (2008).

2 As highlighted by Shah (2012) the program is plagued with measurement problems. The determinants of expenditure needs for various expenditure categories are identified on the basis of broad judgments, the procedures used to estimate factor weights and combine various factors into functional forms are quite arbitrary.
may result in a soft-budget constraint by undermining "[...] monitoring and enforcement via conflicts over technicalities, discretion in the implementation, high transaction costs in terms of administration, abuse of the lack of clarity by politicians, surveillance fatigue and confusion in rather than supportive monitoring by financial markets and the public". Saiegh and Tommasi (1999) highlight a number of incentive problems in the intergovernmental transfer systems in Latin America., the most relevant in our context being the lack of incentives to produce information. In the case of Argentina, sub-national financing system rewarded inefficiency by penalizing provinces that produced better data on costs and technologies of providing public services. In Colombia, instead, there were problems related to the use of not up-to-date data. Finally complexity may increase the amount of public resource that politicians may divert to personal purposes. Kotsogiannis and Schwager (2008) have argued that the complexity of equalization transfers reduces the accountability of local policy-makers as the lack of transparency hinders the ability of citizens to detect the politicians’ rent-seeking behaviour by comparing the local provision of public goods with that of neighbouring jurisdictions.

In sum, in the design of expenditure need equalization a social planner faces a trade-off between accuracy on one side and a series of costs related to implementation and enforcement on the other side. Accuracy can only be achieved using complex rules which are difficult to implement and hard to monitor.

The existence of such trade-off is well known (Vaillancourt and Bird, 2005, Shah 2012, Schuknecht, 2004) but the existing literature provides only limited insights on the factors that may affect the way it is solved in different countries. Recent contributions in the field of political economy literature have stressed the role of politics in shaping the intergovernmental transfer systems. These analyses suggest that political incentives may have an impact on how transfers are distributed across sub-national jurisdictions and how these local jurisdictions use the transferred resources to actually provide service to their citizens. (for a review see Khemani 2007). However this literature does not specifically take into account the decision-making process that lead to the actual choice between complex and simple rules. As a consequence there is no explanation of why the complexity of equalization systems has increased over time as recently noted by Shah (2012).

This paper aims at providing some insights on the factors that may support the adoption of complex rules by analysing the recent Italian experience. Italy has implemented a new system of equalization of expenditure needs for local municipalities following the general reform of sub-national government financing issued in 2009. The decision process envisaged by the law for the choice of the precise structure of the equalization grants is quite complicated. It involves several institutions (the central government, the Association of the Italian municipalities (ANCI) and the Parliament) and a number of rounds of negotiations. The end result of such a process was the choice of a very complex rule.

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3 The issue of the choice between simple and complex rules has been analysed in a number of areas. Kaplow (1996) in the context of optimal taxation has highlighted how tax systems are characterized by the trade-off between rules that measure income more accurately and by more enforcement and the consequent increase in compliance and enforcement costs. Epstein (1995) has discussed the optimality of simple rules in the context of law and economics.
We evaluate several explanations for this outcome. The first one is that a complex rule may have collected a higher consensus among local policy makers as it allows more degree of freedoms in the distribution of resources. For example Vaillancourt and Bird (2005, p. 20) argue that “introducing still more elements in the formula on the expenditure may be a useful way to, as it were, reduce the annual political turmoil about who gets what”. However, quite surprisingly, we found that a majority of local municipalities would have received more resources with a simpler rule. This implies that the simple rule would have collected a higher consensus among local municipalities and be chosen if the decision process was based on majority voting among local policy makers.

We discuss three alternative explanations for this puzzle. First, following Kotsogiannis and Schwager (2008), we consider the possibility that the local policy makers have supported the complex rule because under a complex equalization system they can be able to increase their rents. Even if we show that the simple rule grants higher resources to a majority of local municipalities, it can be the case that the complex rule allows a majority of policy makers to increase their own rents. We show that this explanation is theoretically sound only if the complex rule is less accurate than the simple one in measuring the expenditure need. We are able to show that this is actually the case for the rule that has been actually implemented and can therefore conclude that the hypothesis that complex rules are preferred by local policy makers because they reduce accountability is consistent with the Italian experience.

The second explanation focuses on the decision process. The fact that the rule chosen at the end of the process would have loosen in a majority voting against a simple rule, can be explained by the fact that the collective choice was based on a mechanisms different from majority voting. As a matter of fact there was a bargain among different institutions each representing different constituencies. We will provide evidence that through the bargaining process each municipality has been assigned a different weight depending on its size and geographical location.

The rest of the paper is organized as follows. The next section provides a simple theoretical framework to analyse the choice between complex and simple rules within the framework of a majority voting system. Section 3 considers the case of the equalization scheme for the Italian municipalities by describing the institutional background and showing how the complex rule cannot be the result of a majority voting. Section 4 discusses alternative explanations. Section 5 concludes.
2. The choice between a complex and a simple rule under majority voting and bargaining

This section presents a simple framework for analysing the choice between simple and complex fiscal equalization rules through majority voting.

A preliminary step is the definition of complexity. Several alternative dimensions of complexity have been proposed in the literature on complex systems (Mitchell 2009). They can be classified into three broad categories (Lloyd 2001): a system is complex if it is difficult to describe, or if it is difficult to construct or duplicate, or if it requires a high degree of organization. As to equalization schemes, complexity spans along the first two dimensions (description and realization). The complexity in describing the rule can be adequately proxied by the amount of required information, i.e. the number of variables used as inputs in calculation. For example, rules that rely on the ad hoc determination of expenditure needs are less complex in term of information than those based on the RES approach, as the latter require knowledge of a far larger number of variables. For a given degree of complexity in description the equalization mechanisms could very well entail different degrees of complexity in realization. For example, as highlighted by Shah (2012), within the RES approach, the relative weights that should be assigned to each need/cost factor could be determined in a computationally simple (by using direct imputation methods) or complex way (by relying on regression analysis).

In this paper we focus on the first dimension of complexity, what we referred as complexity in description. An equalization scheme can be represented by a function:

\[ y = f(x^1, x^2, ..., x^m) \]  

where \( y \) is the \((n\times1)\) vector of monetary payoffs assigned to the \( n \) jurisdictions and \( x^i \) are \((n\times1)\) vectors of jurisdictions’ characteristics. We regard the equalization scheme (1) as more complex than an alternative scheme \( w = g(x^1, x^2, ..., x^h) \) if and only if \( m > h \). This definition implies that we neglect two other possible sources of computational (realization) complexity: the complexity of functions \( f \) and \( g \) and the complexity of the computation of \( x^i \) variables. This simplification fits well with the specific case analysed in this paper since, as described in the following section, the general methodological approach to be followed for the design of the equalization system (i.e. RES through regression analysis) was directly provided by the law and the choice was restricted among alternative regressions, basically described by a different number of control variables.

Notice that our definition of complexity does not imply that a complex rule is necessarily more accurate. In the case of the equalization scheme, accuracy is related to the precision in implementing a fair and efficient assignment of resources across jurisdictions. A complex scheme that includes variables which are not related to equity and efficiency criteria may be less precise, and therefore less accurate, than a simple rule which takes account only of relevant variables.
It has been argued that in a decision making system based on majority voting a complex rule would always collect a larger share of votes since it allows more degrees of freedom in the assignment of resources and in this way it succeeds in achieving the support of the majority of voters (Vaillancourt and Bird 2005). But this is not necessarily the case. As a matter of fact the outcome of majority voting depends on the distribution of the characteristics that actually distinguish the considered jurisdictions compared to those characteristics that enter into the equalization scheme.

This point can be illustrated by means of a simple example. Consider the case where the choice between the equalization schemes $y$ and $w$ is taken by majority voting by the representatives of municipalities and assume that the each representative is only interested in maximizing the monetary payoff received by its own jurisdiction. Assume that $n^2$ jurisdictions are uniformly distributed inside a $n \times n$ grid defined in terms of two jurisdictions’ characteristics $x^1, x^2$ (see Figure 1 where the circles located in the intersections of the grid represent the jurisdictions characterized by different level of $x^1, x^2$). Let $M$ be the total amount of resources to be allocated across jurisdictions through the equalization scheme. Using our definition of complexity we can consider three different groups of equalization schemes, from the simplest to the most complex ones: the scheme $z$ (the simplest one) which assigns the same uniform amount of resources ($M/n^2$) to each jurisdiction; the schemes of type $y = f(x^1)$ (the intermediate ones in terms of complexity) which assign the resources uniformly to each jurisdiction in a subset selected by taking into account the location along only the first dimension (i.e. jurisdictions in the same position along dimension $x^1$ would get the same amount of resources irrespective of the position along dimension $x^2$); and lastly the schemes of type $w = g(x^1, x^2)$ (the most complex one) which assign the resources uniformly to each jurisdiction in a subset selected by taking into account the location along both dimensions $x^1$ and $x^2$.

**Figure 1: Majority voting in two dimensions**

![Majority voting in two dimensions](image)
Now if we look at the schemes of type $y$, which takes into account only one of the two dimensions, it can be easily seen that among all possible schemes of this type the ones that cannot be beaten in a majority voting are those which assign an amount $M/((n+n^2)/2)$ to each jurisdiction in a subset of $n+n^2/2$ jurisdictions (e.g. those lying on the first $1+n/2$ rows of the grid, denoted by non-white circles in figure 1).

Analogously when we look at the schemes of type $w$, that refer to both dimensions, majority voting would choose the ones that assign an amount $M/(1+n^2/2)$ to each jurisdiction in a subset of $1+n^2/2$ jurisdictions (e.g. those lying on the first $n/2$ rows of the grid plus one jurisdiction, denoted by black circles in figure 1).

Building on these results, when we compare pairs of different types of equalization schemes, complex schemes always would win in a comparison as a majority of $n+n^2/2$ jurisdictions would prefer the scheme $y$ over $z$ and, by the same token, a majority of $1+n^2/2$ would prefer the scheme $w$ over $y$: in both cases by using the more complex scheme the total amount of resources $M$ is apportioned among a more restricted group of jurisdictions than when the simpler rule is adopted and consequently the monetary payoff received by each of winning jurisdictions is maximized.

An instance where the complex rule is not supported by majority voting is described in the next section. We will show that the complex rule would not have win in a majority voting against a simpler rule were the representatives of municipalities solely interested in the amount of resources received from the equalization scheme.

However the advantage of complex schemes in the previous example lies in the ability of those schemes to further discriminate among jurisdictions. This advantage is not substantial if complexity is achieved by introducing into the scheme variables that are not correlated with the characteristics of the jurisdictions. To illustrate this point consider the case where all jurisdictions are uniformly distributed along the first column of the grid ($n$ for each node). In this case the scheme $w$ is more complex than the scheme $y$ because it includes an additional variable $x^2$, but this variable is not correlated with the jurisdictions location. As a consequence the scheme $w$ cannot select a subset of jurisdictions that cannot be also selected by the scheme $y$ and therefore there is no majority that may strictly prefer $w$ over $y$. We may conclude that complexity will be supported by majority voting only if it is achieved by including variables that are actually correlated with jurisdictions characteristics.

An alternative explanation of why the complex rule was chosen despite a majority of municipalities would have been better off with a simpler one, may be given by the fact that the collective choice was based on a bargain among different institutions each representing different constituencies. The literature on decision making within the European Union (Schneider et al. 2010) have long recognised that the purely preference-based models are not always the best predictors of the negotiations within the European Union. In our framework the choice of the complex rule may be explained by taking into account that the preference of voters in each municipality may have been weighted differently in the objective functions of each institution involved the decision-making process.
Let $U_i(.)$ the utility function representing the preferences of municipality $i$ and $F_j$ the resources allocated to municipality $i$ under the rule $j$. Under majority voting among municipalities, the rule $j$ would beat rule $k$ if the share of municipalities for which $U_i(F_j) - U_i(F_k) > 0$ is higher than 50%. In a bargaining process the preferences of each municipalities would be reflected in the final outcome through the preferences of the various institutional players. We may represent the preferences of player $k$ as:

$$R_k(.) = R_k(F_j, U(.), w^k)$$

where $F_j$ is the vector of resources allocation under rule $j$, $U(.)$ is the vector of the utility functions of municipalities and $w^k$ is a vector of weights that measure the relevance of each municipalities in the objective function of player $k$. Each institutional player may have its own preferences over $F$ (for example the government may prefer rules that produce allocation which are clearly different from the past), if may be concerned with the size of $U_i(F_j) - U_i(F_k)$ (for example the association of municipalities may wish to avoid large losses or gains), an may give a different weight to different subsets of municipalities (large vs small municipalities or Northern vs Southern municipalities).

By analysing the characteristics of municipalities that have received more resources under the complex rule we will show that the dimension and the territorial localization have played a role in the bargaining process.

### 3. The measurement of expenditure need indicators for the Italian municipalities

In the recent past a number of different reforms were brought forward in Italy to overcome the arbitrary criteria ruling the system of vertical transfers from the central government to municipalities. However all these plans were never actually implemented given in particular the strong opposition of those municipalities suffering strong losses from the corresponding grants distribution.

More recently the enactment of the framework law dealing with a general reform of sub-national government financing (Law 42/2009) marks a step forward in the revision of the equalization system for the Italian municipalities. As a matter of fact the reform provided that for the main municipal expenditure programs (about 80% of their current expenditures) equalizing transfers from central government should fully fill the gap between standardized expenditure needs indicators and local own fiscal capacity. Later a government decree assigned the task of determining standard expenditure need indicators (SEN) jointly to central government and to ANCI the Association of Italian municipalities.

The methodologies for determining SEN are characterized, on the one hand, for the quantity of data used to capture the environmental and socio-economic characteristics of the territories of the local authorities being analyzed, and on the other hand for the statistical techniques used.
to select and evaluate the weight these variables have in determining differentials expenditure needs.

The simplest and least refined standardization approach is that of uniform per capita expenditure, in which the size of the resident population is used as the sole determining factor for expenditure needs. Costs are standardized based on a uniform per capita amount for all authorities, equal to the macro-budget divided by the resident population: expenditure needs for each authority are obtained by multiplying this per capita value by the resident population. A more complete approach to the calculation of expenditure needs, which includes other variables in addition to the size of resident population, is the Representative Expenditure System (RES). In this approach, the expenditure needs for each authority are determined by the linear combination of a series of load factors obtained in relation to the weight these factors have in determining expenditure needs. Load factors can include environmental characteristics such as surface area, number of residents, composition of the resident population by age, length of roads, etc., or structural elements related to the quantity of services produced and the inputs employed for supplying local public services. Usually, the choice of these factors is entrusted to experts or to decisions of a political nature, while weights are normally determined using statistical methods. The RES approach can provide acceptable results when the authorities analyzed are few in number and economically and socially similar. However, its application becomes less effective when the mixture of local authorities has markedly varied characteristics. The immediacy and flexibility of the RES are not supported by a theoretical model that can act as a guide in the selection of load factors and weights, which, in essence, are discretionary. For these reasons, the majority of developed countries that allot equalization grants based on SEN adopt an approach that is similar to the RES but more sophisticated in its application.

The most sophisticated method is the Regression-based Cost Approach (RCA), based on which the SEN of each authority are assessed as the expected value for a cost function estimated using multiple linear regression techniques. With the RCA approach, the selection of variables to be inserted in the estimation model is guided by a theoretical framework based on the interaction between the demand for public services expressed by citizens and the supply of public services expressed by the local government. The result is that the efficient cost of supplying a given service depends on three essential groups of variables: the quantity of service offered approximated in the majority of cases by demand factors (context variables related to the demand side); prices for the inputs used in the production process (primarily labour costs); and the context variables related to the supply side, i.e. external factors that, with other conditions being equal, can favor or hinder the supply of local public goods (e.g. the morphological characteristics of the territory, or the extension of its surface area). The weight with which each variable affects the determination of SEN is estimated in a statistically robust manner through the use of multiple regression techniques. In this way all factors for calculating cost differentials are determined within a model that is capable of correctly representing the variables that identify the real determinants of expenditure needs, especially in the case of extremely heterogeneous local authorities.
In the end of 2013, following the RCA approach, the Italian government produced the first wave of the assessment of SEN for 6702 municipalities. This marked the beginning of a radical reform of intergovernmental relations in Italy, taking the first and necessary step towards the construction of a new and more efficient mechanism for the distribution of equalization grants to finance the essential services of municipalities (34 billion euros in 2010). The essential functions of municipalities regards twelve services: tax office (0.50 billion euros), technical office (1.02 billion euros), civil registry (0.55 billion euros), general services (6.39 billion euros), public roads (2.21 billion euros), local public transport (1.00 billion euros), land management and planning (1.67 billion euros), waste management (7.61 billion euros), general social services (4.67 billion euros), nursery services (1.44 billion euros), local police (2.64 billion euros), complementary education services (3.57 billion euros). For each of function was estimated a specific model following the RCA approach.

Table 1 shows the percentage impact exercised by homogeneous groups of variables in determining the standard expenditure of each service. In all, 122 variables divided into 13 homogeneous groups contribute to the determination of municipal SEN. The size of the resident population generates 20% of the total variables’ contribution, and it is one of the main components of the expenditure needs for six services: general services, registry office, local public transport, tax office, technical office and general social services. In particular, the numerousness of resident population exerts a mainly negative impact in the case of services relating to the registry office, the technical office and the tax office, providing evidence in favour of economies of scale related to the size of the municipality. The positive impact of the size of the municipality can be observed in the case of general social services and local public transport, in which cases the size of the resident population can also be interpreted as an important demand factor due to congestion phenomena.

The level of provided services generate almost the 14% of total variables’ contribution and is the main component of the expenditure needs for complementary education services (with regard to the management of kindergartens, and the provisions of complementary services for primary and secondary schools) and nursery services, for which in both cases a cost function approach has been followed. The main expenditure driver is the number of attending children although, in total, 29 variables have been used to measure all different aspects of services that include, among others, school meals, transportation and care of children with disabilities.

The variables used to map the characteristics of the territorial morphology and other environmental features of each municipality (for example the seismic risk, altitude level or climatic zone) generate about 9% of total variables’ contribution and are the main expenditure components of services related to public roads maintenance (including, for example, lighting and security of urban roads), land management and planning (for example, the maintenance of green areas).

The variables that describe the structure of the local economy provide about the 8% of total variables’ contribution. They include, among others, the number of workers in the entertainment and touristic sector, which plays an important role in determining expenditure
needs in the waste disposal sector; or the level of female employment, which particularly affects the demand for general social services.

The input prices generate about 8% of the total variables’ contribution and they represent a cross component for all services, since they mainly measure the differences in labour costs along the peninsula.

External load factors generate about the 7.5% of the total variables’ contribution and include a group of variables which measure services provided by municipalities to higher-level governments and the quantity produced is usually not directly attributable to the decisions of local administrators. This group includes: crime notifications, lawsuits and disputes received, the notification of traffic accidents in the case of local police services; the front-office activity carried out as part of the registry office services.

Variables measuring the number and types of buildings, such as the number of residential and non-residential buildings, produce about 7% of the total variables’ and is an important determinant of the expenditure needs for services of waste disposal and services performed by the tax office.

Variables related to organisational choices generate less than 6% of the total variables’ contribution and include choices not directly modifiable in the short term, such as the number of districts that affect the expenditure for general services, or the decision to provide residential services or home care services. In other cases these variables measure qualitative elements for which there are reference standards, such as the staff/child ratio in nursery services.

Variables measuring the level of deprivation (such as the number of people with addictions or mental illnesses, the number of students with disabilities, and the percentage of families in a situation of severe poverty) produce approximately 5% of the total variables’ contribution and represent one of the main determinants of the demand for general social services.

The intensity of vehicular traffic and the structure of urban roads generate about 5% of the total variables’ contribution. This group of variables, among which we can find the length of the urban roads, the number of incoming and outgoing commuters, and the parking areas for people with disabilities, is an important determinant of the expenditures of the local police service, and of services related to public roads and urban transport.

Variables measuring the demographic structure (such as population density, the percentage of elderly people over 65, the number of entries in registry office) generate approximately the 5% of total variables’ contribution and have a positive impact on the demand for many services, primarily those of the registry office and general social services.

The tourist attraction, represented by the number of tourists registered in hotels and complementary facilities, and by the number of museums visitors and of tourists in second homes, produces about the 5% of total variables’ contribution and is one of the main determinants of the demand for the services of waste disposal.

The average amount of investments, made in the five years prior to the year taken as a reference for the valuation of the expenditure needs, generates less than the 1% of total
variables’ contribution and mainly affects the expenditure of the technical office and services related to public roads.

Finally, it is important to point out that the expenditure variation explained by a specific set of variables has been eliminated in the calculation of the SEN. In order to capture in a precise way the differentials of actual expenditure, and to avoid the risk of estimating biased coefficients due to omitted variables, these variables have been included as regressors in the expenditure and cost functions, however, they cannot be considered as expenditures determinants in the valuation of the SEN, as their effect goes beyond the definition of standard expenditure. This set includes the following groups of variables: the regional fixed effects designed to capture the average regional differences of expenditure, the local fiscal revenue recorded in the five years prior to the year taken as reference for the expenditures valuation, the dummy variables which capturer the differentials of expenditure related to different forms of joint provision (union of municipalities, conventions, consortiums, etc.) and, lastly, the average total municipal per capita income reported as tax base for the national personal income tax (IRPEF tax base). The neutralisation of the effect produced by these variables is accomplished by using, in the computation of the SEN, an equal value (in most cases, null) for all of the municipalities, in order to make the standard expenditure very little subject to the discretionary choices of local governments or to elements that reproduce the trend of the actual expenditure such as the regional fixed effects. The same treatment, in fact, has been assigned to most of the variables used to evaluate the organisational choices: this group includes a total of 30 variables of which, only 12 are included in the calculation of the SEN. As previously mentioned these exceptions are mainly due to the need to incorporate in the standard expenditure local choices that are not directly changeable in the short term or linked to qualitative elements such as child-teacher ratio in nursery services.

Using the definition given in the previous section we refer to the official scheme developed by the government in cooperation with ANCI and the Parliament as the “complex scheme” since it relies on the complete set of variable reported in Table 1. We compare this “complex scheme” with two alternative schemes that are simpler as they use a more limited set of covariates.

The “intermediate scheme” is derived from the “complex scheme” by considering only a subset of variables: in particular for each function only the group of variables with the largest standardized coefficient are included in the computation of the standard expenditure levels. In this way the total number of variables shrinks from 122 to 58.

Finally, the “simple scheme” is obtained considering only the resident population in the computation of the standard expenditure levels. In this last case the level of standard expenditure per capita is the same for all municipalities. And SEN become perfectly proportional to the dimension of each municipality.
Table 1 – Summary of the determinants of municipal standard expenditure needs

<table>
<thead>
<tr>
<th>DETERMINANTS OF STANDARD EXPENDITURE NEEDS (In parentheses, the percentage of each service’s standard expenditure with respect to the total)</th>
<th>No.</th>
<th>TOTAL (100%)</th>
<th>Waste management FC05B (21.02%)</th>
<th>General social services FC06A (16.36%)</th>
<th>General services FC01D (16.33%)</th>
<th>Education (complementary services) FC03U (13.50%)</th>
<th>Local Police FC02U (7.61%)</th>
<th>Public roads FC04A (5.66%)</th>
<th>Land management and planning FC05A (4.60%)</th>
<th>Technical office FC01B (3.95%)</th>
<th>Nursery services FC06B (3.57%)</th>
<th>Local public transport FC04B (3.56%)</th>
<th>Tax office FC01A (1.92%)</th>
<th>Civil registry FC01C (1.92%)</th>
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<td>MANAGERIAL CHOICES(3)</td>
<td>12</td>
<td>5.83</td>
<td>15.57</td>
<td>2.98</td>
<td>12.61*</td>
<td>5.40</td>
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<td>19.10*</td>
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<td>DEPRIVATION</td>
<td>8</td>
<td>5.34</td>
<td></td>
<td>32.62</td>
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<tr>
<td>VEHICLES AND ROAD TRAFFIC</td>
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<td>5.17</td>
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<td></td>
<td>14.62</td>
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<td>12.78</td>
<td>3.95</td>
<td>12.51</td>
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<td>INVESTMENTS(4)</td>
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<td>0.94</td>
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<td></td>
<td></td>
<td></td>
<td>8.66</td>
<td>11.40</td>
<td></td>
<td></td>
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** Variables exerting a predominantly negative impact
* Variables exerting a partially negative impact

(1) The percentage impact of each homogeneous group of variables is determined by re-proportioning the standardized coefficients based on the relative weight of each function. The empty boxes indicate that none of the variables in the homogenous group had a statistically significant impact (p-values less than or equal to 0.05) on expenditure.

(2) Polynomials of the resident population. These variables capture the presence of particular economies of scale related to the size of the resident population and to congestion phenomena.

(3) Organizational choices regarding qualitative elements and management decisions not immediately modifiable in the short term.

(4) The exogeneity of the variables measuring the level of investment choices is guaranteed through the use of average values over the five previous years.
We first test whether the choice of the complex rule could be rationalized as the result of a majority voting among municipalities over pairs of alternative schemes. We consider both the case in which each municipality casts one vote and the case where all citizens may express their preferences. We assume that both citizen and representatives of municipalities are only interested in the amount of resources received by their own jurisdiction.

In the first case the voting mechanism assigns the same weight to each municipality irrespective to its own population size. The results are reported in the first row of table 2 (“Net # municipalities not weighted for population”): the number of municipalities that would receive higher transfers when the intermediate scheme is adopted outweighs by 25 the number of municipalities that would receive more from the complex scheme. Hence in a majority voting the intermediate scheme would win against the complex one. By the same token, the table suggests that the simple scheme would win both against the complex scheme (by a margin of 461 votes) and against the intermediate scheme (by a margin of 436 votes). Majority voting would then yield a complete and transitive ordering where simplest scheme are consistently preferred to more complex ones: “simple scheme” ≻ “intermediate scheme” ≻ “complex scheme”.

<table>
<thead>
<tr>
<th>Net # municipalities not weighted for population</th>
<th>“intermediate” &gt; “complex”</th>
<th>“simple” &gt; “complex”</th>
<th>“simple” &gt; “intermediate”</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>461</td>
<td>436</td>
<td></td>
</tr>
<tr>
<td>672,020</td>
<td>3,614,847</td>
<td>2,942,827</td>
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</table>

We can now consider that the case where the majority voting takes into account the relative size of municipalities, giving higher weight to the vote of municipalities with larger population. The second row of table 2 (“Net # municipalities weighted for population”) reports the margin of votes between pairs of alternative schemes when each Municipality is weighted by its population. The “simple scheme” ends up being the most preferred and the “complex scheme” the least preferred.

In conclusion, said the choice of the “complex” scheme cannot be rationalized as the result of a majority voting since the simple scheme would have been always preferred by the majority of municipalities whatever voting system is adopted (allowing for the consideration of population size or not).

In the next section we explore two alternative potential explanations of why the complex rule has been choose. The first is based on the possibility that local politicians may have supported the complex rule because under a complex equalization system they could be able to increase
their personal rents. The second focuses on the decision process. As a matter of fact the collective choice was based on a bargain among different institutions each representing different constituencies.

4. Looking for explanations: accountability and bargaining power

A first argument that can be used to rationalize the complex equalizing formula applied in the Italian context can be derived from Kotsogiannis and Schwager (2008). The authors have argued that the complexity of the equalization grants may have an impact on the accountability of local politicians. In particular, they show that within a political economy scheme, the implementation of an equalization program may produce both a positive and a negative effect. The positive effect arises because with equalized fiscal resources citizens can better detect rent-taking behaviour by local politicians by observing any remaining variation in public good provisions and so they can punish it more severely in elections. This induces politicians to restrain themselves to extract personal rents and so accountability improves. The negative effect arises when such equalization programs reduce the informational content of observed public good provisions and this effect, in the interpretation of Kotsogiannis and Schwager, is positively correlated to the complexity of the equalization mechanisms: the higher the complexity, the higher the “noise” produced by the equalization system and the lower the quality of the information provided by the variation in public good provisions. This introduces a perverse fiscal incentive that reduces accountability. Thus, according to Kotsogiannis and Schwager, local politician would prefer a complex rule that facilitate rent-taking.

Therefore this argument can contribute to explain the choice of the complex rule made in the equalization of the Italian municipalities: local politicians may have supported the complex rule through the policy-makers involved in the decision process because they have foreseen that under a complex equalization system they would be able to increase their rents, even if their own jurisdictions would receive less resources than under the simple rule.

Another second possible explanation of the complex outcome resulting from the decision-making process relies on the idea that the collective choice was based on a bargain among different institutions each representing different constituencies, as discussed in Section 2. In this framework different municipalities can be weighted differently in the objective functions of each institutional actor involved the decision-making process. Two possible features of municipalities are considered here. First it is likely that gains/losses of the municipalities of different demographical size weight differently in the decision process. Looking at the municipalities differentiated by population size, figure 2 shows that the percentage of municipalities that gain compared to the pre-reform apportionment:

- for the smallest municipalities is maximized when the complex rule is adopted;
- for medium-sized municipalities is maximized when the simple rule is adopted;
- for the largest municipalities is maximized when the complex rule is adopted.
It is obvious that the size of the municipalities has a significant impact on their ability to affect the outcome of the decision-making process. In particular, in the governing bodies of the Association of the Italian municipalities, that as illustrated in Section 2 is one of the main actor of the decision-making mechanism, the largest municipalities are traditionally over-represented.

![Fig. 2: Gains for municipalities of different size](image)

Note: uffp1 = complex scheme; intp1 = intermediate scheme; unip1 = simple scheme.

To the same token, the territorial localization of municipalities probably matter in the stakeholders’ objective functions. The choice between the complex rule compared to the simple one differently affects the municipalities localized in different regions. In particular, as shown on figure 3, the percentage of the population of the municipalities that gain compared to the status quo resources apportionment:
- for municipalities located in North-western Italy is maximized when the complex rule is adopted;
- for municipalities located in North-eastern Italy the gain turn to be almost the same when the complex rule or the simple rule is adopted;
- for municipalities located in Centre Italy is maximizing when the simple rule is adopted;
- for municipalities located in Southern Italy is maximized when the simple rule is adopted.
The role of territorial localization of municipalities in conditioning the outcome of the decision process emerges in particular when we look at the parliamentarian stage of the process. The parliamentary committee in charge of the enactment of the equalizing transfer formula (see Section 2) has a composition that is skewed in favor of the members elected in constituencies in Northern Italy (more than 60%). Even the number of speeches of the members of the committee during the discussion of the bills about expenditure needs indicators shows a stronger activism of MPs elected in the Northern Italy, presumably closer to the interests of the municipalities located there and therefore supporting the complex formula. The newspaper based in Southern Italy has often criticized the poor participation of members coming from South Italy in discussions of the Committee⁴.

Fig. 3: Gains for municipalities in different areas

![Graph showing gains for municipalities in different areas.](image)

Note: uffp3 = complex scheme; intp3 = intermediate scheme; unip3 = simple scheme.

5. Concluding remarks

This paper investigates the way the collective decision mechanisms affects the adoption of complex vs. simple fiscal rules. The existing literature provides little guidance on the positive ground on the collective decision-making processes that lead to the actual choice between

⁴ Il Mattino, 14 February 2016, p. 6.
complex and simple rules by clearly considering the trade-off that this choice involves. This paper aims at providing some insights on this issue through the analysis of the recent Italian experience on the design of equalization grants at municipal level. First of all a simple theoretical framework is provided to analyse the choice between complex and simple rules within the framework of a majority voting system. Differently from what is generally suggested – in a decision making system based on majority voting a complex rule always collects a larger share of votes – we argue that this outcome is not necessary but depends on the distribution of the characteristics that actually distinguish the considered jurisdictions compared to those characteristics that are relevant for the fiscal rule. A case in which the complex rule is not supported by majority voting is the choice of equalization system applied for the Italian municipalities. We show that the complex rule recently implemented would not have won in a majority voting against a simpler rule were the representatives of municipalities solely interested in the amount of resources received from the equalization scheme whatever voting system was adopted (allowing for the consideration of population size or not). Successively we explore alternative explanations of the reason why the complex rule actually prevailed on the simple one in the Italian decision-making process. The first argument is based on the possibility that local politicians may favour the complex rule because under a complex equalization system they could be able to increase their personal rents. The second focuses on the role of the bargaining power of different categories of municipalities which condition the objective functions of the institutional actors involved the decision-making process. Two relevant features of municipalities are considered: size and territorial localization. We found evidence that the stakeholders involved in the process are likely to have fostered the interests of largest municipalities and of municipalities localized in Northern Italy, which are favoured by the adoption of the complex rule compared to the simple one.
References


