COMPLEXITY IN THE DESIGN OF INTERGOVERNMENTAL EQUALIZATION SYSTEM: THE CASE OF EXPENDITURE NEEDS INDICATORS IN ITALY

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Complexity in the design of intergovernmental equalization system: 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 and ex-post enforceability. However, the existing literature does not provide any guidance on how to solve the trade-off.

This paper follows a positive approach and investigate the way the collective decision mechanisms (i.e. voting system) affects the adoption of complex vs. simple 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 equalization rule proposed by the Italian Municipalities and discuss the factors that may have affected the outcome of Municipalities' collective choice.

Keywords: Expenditure needs; Equalization; Complexity; Fiscal rules
JEL classification: H72; H77

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1. Expenditure needs equalization and complexity

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 government with different abilities to raise revenues to provide comparable levels of services with comparable levels of own-taxes (Vaillancourt and Bird, 2005). From the point of view of efficiency the aim is to eliminate different net fiscal benefits across states that 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 climatological conditions, in the incidence of poverty, in production costs and factor prices, and so on.

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 (Shah, 2012): a) ad hoc determination of expenditure needs; b) representative expenditure system (RES). The RES approach mimics the representative tax system (RTS) used to equalize fiscal capacity. This 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 ad hoc determination of expenditure needs is simpler but it may still result in complex calculations.

The main rationale for complex rules in the field of expenditure need equalization is therefore accuracy: if equalization aims at eliminating net fiscal benefits, both on equity and efficiency ground, all relevant difference across jurisdictions must be properly taken into account.

The complexity of the fiscal equalization rules however may cause a series of problems. 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 illustrates quite well these practical difficulties (Petchey and Levtchenkova 2007). The Commonwealth Grants Commission (CGC) of Australia determines the relative expenditure needs for 41 state-local expenditures using several hundred factors needs in three broad categories: (a) scale factors (b) demographic factors – these include dispersion, urbanization, social composition and age structure; and (c) environmental factors including physical and economic factors. 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.

In the long-run a complex rule may also cause moral-hazard problems. As argued by Schuknecht (2004) a complex rule 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". Furthermore a complex rule usually require recurrent adjustments thus creating time inconsistency problems. Saiegh and Tommasi (1999) argue that this was a main issue in the intergovernmental transfer systems in Latin America. The authors highlights a number of incentive problems, the most relevant in our context being the lack of incentives to produce information. The authors mention the case of Argentina, where sub-national financing system rewards inefficiency by penalizing provinces that produce better data on costs and technologies of providing public services. In Colombia, instead, there are problems related to the use of not up-to-date data.

We may conclude that the design of the expenditure need equalization faces trade-off between accuracy on one side and ex ante implementability and ex-post enforceability 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 little guidance on how to solve it[1] and does not explain why the complexity of expenditure equalization has increased over time as recently noted by Shah (2012).

This paper follows a positive approach and investigate the way the collective decision-making mechanisms (i.e. the voting system) affects the adoption of complex vs simple rules.

The output of a voting system depends on a series of factors. The first one is the distribution of the characteristics of voters. At a first sight it may seem that a complex rule would be able to collect a higher consensus 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". But this is not necessarily the case. When a majority of sub-national governments share a subset of characteristics that affects expenditure needs, a simple rule based on such characteristics may be chosen. This point can be illustrated by a simple example. Assume that the jurisdictions are distributed along a circle and that a given amount of resource must be distributed to a subset of them defined by a rule to be chosen by a majority voting. A simple rule may be the one that divides the circle into two areas (North/South or East/West). The resources are then distributed to one of the two areas only. A more complex rule is the one that identifies four areas (North-East, North-West, South-East and South-West). In this case the resources can be distributed to a maximum of three areas.

[1] 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.

The complex rule (with the resources assigned to three out of the four areas) will win in a majority vote when jurisdictions are uniformly distributed along the circle. However, if the jurisdictions are concentrated in a particular area (e.g. the North) the simple rule may prevail.
The same example shows that the relationship between the distribution of jurisdiction characteristics and the outcome of majority voting over complex and simple rule can be even more intricate. If the majority of jurisdiction lie in a particular region (e.g. South-East) the more complex rule may win if resources are assigned to the region.
The outcome of the collective decision will also depend on the institutional framework. Consider again the case where jurisdictions are distributed uniformly along the circle. We concluded that if the choice is delegated to the representatives of local governments through majority voting the outcome will be complex rule. However if jurisdictions are very different in terms of population, the simple rule could prevail in a direct vote among all national citizens if the more populated jurisdictions are concentrated in half of the circle.
This paper analyses these issues with reference to the recent Italian experience on the design of equalization grants at municipal level. As illustrated in the following section, a number of questionnaires have been recently sent to Municipalities in order to collect very detailed information about their structural characteristics and the techniques adopted to produce different categories of public services. This information have been used to derive for each Italian Municipalities and for each local expenditure sector estimates of expenditure need indicators ("fabbisogni standard") to drive the apportionment of financial resources from central government to territories required to provide those public services.
We will consider three different rules for determining the expenditure needs indicators related to the local police expenditure programme. The first one was proposed by IFEL, the research institute of the Association of the Italian Municipalities specialized in the field of local public finance. Despite the IFEL proposal has not been implemented in practice, we considered it as the result of a collective choice mechanism among Municipalities. As explained in the following section the IFEL proposal is rather complex as it requires information on a large set of variables. We will compare two alternative rules against the IFEL benchmark. Such rules are increasingly simpler as they make use of a decreasing number of explanatory variables.
Quite surprisingly, we find that both the majority of Municipalities and the majority of citizens living in these Municipalities would vote for the simpler rule rather than for the IFEL proposal. This result suggest that collective choice has been affected by additional factors beside the distribution of expenditure needs and the assignment of the right to vote. The paper discusses two additional explanations that can be supported by the data. The first one is that the status quo (i.e. the actual distribution of public expenditure) can be used as a threat point by Municipalities. Given that the IFEL proposal provide a close approximation to existing expenditure, the Municipalities that prefer the status quo may have block the adoption of the simpler rule. The second argument that we consider is that some groups of Municipalities may have exerted a greater pressure within the political process.

2. The measurement of expenditure needs indicators: the experience of the Italian Municipalities

In the recent past a number of different reforms were proposed in Italy to rationalize the allocative mechanism of transfers from the central government to Municipalities thus overcoming the arbitrary criteria by which national equalization funds were apportioned.

The first reform was worked out in 1995-96. The proposed equalization system was based on a restricted array of simple per-capita indicators at Municipal level concerning outlays, revenues and some structural information (age distribution of population, extension the Municipal area, number of residents, income, etc.). Despite the reform did not involve all the existing transfers but only the expected increases in the following years, it was never actually implemented given the strong opposition of Municipalities suffering losses from the new grants distribution.

Since one of the reasons of failure was ascribed to the extreme simplicity of indicators, a special committee ("Osservatorio sulla finanza locale") was appointed by the Ministry of Internal Affairs in order to develop more sophisticated criteria. The committee provided both to increase the informative contents of indicators and to favour the support of majors to the use of criteria different from the historical expenditure. Notwithstanding, the reform proposed by Osservatorio was never officially adopted both because it involved the entire amount of transfer, thus creating for some Municipalities large losses compared to the historical expenditure, and because the proposed indicators were perceived to be too complex with respect to the information they provide.

A number of general recommendations can be drawn from this past experience:

1. expenditure needs indicators should be enough detailed to catch cost differentials in local spending;
2. expenditure needs indicators should not be technically complicated and at the same time not much informative about the actual factors determining local spending;
3. expenditure needs indicators should not imply too large deviation from current expenditures at whole and for very influent groups of municipalities (i.e. large cities);
4. expenditure needs indicators should be developed through a process of strict collaboration between central government and local officers;
5. expenditure needs indicators should be framed within a comprehensive reform of local funding system.

The enactment in May 2009 of the framework law providing for the reform of the so-called fiscal federalism (Law 42/2009) marks a step forward in the development of a system of expenditure needs indicators. The reform provides for a system of equalizing transfers for most of the Municipalities' expenditure programs (about 80% of their current expenditures): equalizing transfers from central government should fully fill the gap in each area between (centrally determined) standardized expenditure needs indicators and local fiscal capacity (own taxes and charges).

The subsequent government decree (n.216/10) sets some general guidelines on the methodological profiles for the determination of expenditure needs indicators for the main

local expenditure programmes. First of all the task of calculating standard needs is assigned jointly to central government (by means of SOSE, a public agency specialized in the elaboration of statistical analyses to contrast tax evasion) and to the Association of the Italian Municipalities (by means of the IFEL research centre). The decree provides to enrich the information on municipal intervention by means a series of specific surveys. Finally the decree provides for a progressive application of standard needs in managing the equalization mechanism.

After two years of work, four out of six expenditure programmes at Municipal level have been covered by surveys and for the first function analyzed, local policy (that accounts for about 7% of total current expenditure at municipal level) an agreement has been reached between the central government and IFEL.

In particular IFEL has worked out an estimate of expenditure need indicators for local police for all the Municipalities based on a linear regression approach. The following expenditure function has been estimated:

$$E = \alpha + \boldsymbol{\beta}_W \boldsymbol{W} + \boldsymbol{\beta}_Z \boldsymbol{Z} + \boldsymbol{\gamma}\, \boldsymbol{Y} + \boldsymbol{\theta}\, \boldsymbol{S} + \varepsilon$$

where:

E is the per capita current expenditure for Local Policy net of interest, depreciation costs and extraordinary items

$\boldsymbol{W}$ is the set the prices of inputs employed in the production of the police services (wages, cost of capital)

$\boldsymbol{Z}$ is a set of structural features affecting the production conditions at local level (territorial characteristics)

$\boldsymbol{Y}$ includes variables affecting individual demand for public services (like per-capita income, tax-price burdened on municipal taxpayers and transfers received from other tiers of government)

$\boldsymbol{S}$ is a set of structural features affecting the overall demand conditions at municipal level (population size, commuting, age structure of population).

The fitted values of per capita expenditure $\hat{E}$ are taken as the expenditure needs indicators for the public services programme considered in the regression.

3. Decision making systems and the choice between “complex” and “simple” models

As mentioned before, this paper follows a positive approach in investigating whether different collective decision mechanisms (i.e. voting system) may affect the adoption of complex vs. simple rules. To discuss this point we focus on the case of the estimate of expenditure needs indicators for Italian Municipalities. As discussed in Section 2, this issue is dealt here with reference the local police expenditure programme, that is the item of Municipal budget in which the process of the determination of expenditure needs indicators has up to now been actually implemented.

To the purposes of this work, we refer model developed by IFEL (see Section 2) as the "complex model" since it relies on a very detailed information data-set on structural characteristics of Municipalities and on the techniques they adopt to produce local police and includes a very wide array covariates (as much as 28: see Table 1, Section 1 for the regression results, see the Appendix for a description of the covariates).

We compare this "complex model" with two alternative models that are both more parsimonious in terms of covariates and information requirements. The "intermediate model" (see Table 1, Section 2 for the regression results) is derived from the "complex model" by excluding the covariates that in the "complex model" results to be less statistically significant (t<=3). Finally, the "simple model" (see Table 1, Section 3 for the regression results) is characterized by a dramatic cut in the number of covariates that is now restricted only to the population and population squared in order to take into account possible economies of scale in local police services production. Moving from the "complex model" to the "intermediate model" and successively to the "simple model" the proportion of variability that is accounted for by the statistical models measured by R squared progressively declines[2].

In comparing the three models of determination of expenditure needs indicators previously introduced (and the corresponding distributions of financial resources among Municipalities) we follow a positive approach. Firstly we wonder which of those models (differentiated along the complexity-simplicity dimension) is supported by a collective decision mechanism, and if different collective decision mechanisms may affect the adoption of complex vs simple rules.

Suppose that all Municipalities are involved in a majority rule voting system by which they choose the model to be used to determine expenditure needs indicators by successively comparing pairs of alternative resources assignments corresponding to pairs of estimation models. In the voting system considered here votes in favour of the model that assigns to him more financial resources than the other model under scrutiny, irrespective for the size of gains and losses (in other terms the preference intensity is not included).

[2] To some extent we follow here the same procedure shown in a different setting – that one of the financial student aid programme in the US – by Dynarski and Scott-Clayton (2006).

Tab. 1 The regression models

Section 1: the "complex model"

```
Linear regression                               Number of obs =    2764
                                                F( 28,  2735) =  103.06
                                                Prob > F      =  0.0000
                                                R-squared     =  0.5179
                                                Root MSE      =  .38161

------------------------------------------------------------------------------
             |               Robust
      LOG_Y_pc |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          lpop |  -2.156511   .5234203    -4.12   0.000    -3.182851   -1.130172
         lpop2 |   .1736988   .0548292     3.17   0.002      .066188    .2812095
         lpop3 |  -.0045323   .0018747    -2.42   0.016    -.0082083   -.0008563
        A01_pc |   21.87095   7.348419     2.98   0.003     7.461938    36.27996
        A02_pc |   .0051263   .0026693     1.92   0.055    -.0001078    .0103604
        A06_pc |   .9427867   .2531282     3.72   0.000      .446445    1.439129
  veic_su_supurb |   .0000214   7.93e-06     2.70   0.007     5.85e-06    .0000369
 PERC_ad_turismo |   .9343128   .1293291     7.22   0.000     .6807202    1.187905
     litoraneo |   .1428539    .029679     4.81   0.000     .0846585    .2010493
 LOG_Pz_personale |   .3678083   .0350941    10.48   0.000     .2989947     .436622
 LOG_Pz_veicoli_top |    .076087   .0127512     5.97   0.000     .0510842    .1010899
  LOG_Pz_residuo |   .0592003   .0032635    18.14   0.000     .0528011    .0655996
   Pz_veic_x_dum |  -.0759852   .0127325    -5.97   0.000    -.1009514   -.0510189
OMI_AFFITTO_MQ_2009_EURO |   .0189018   .0041279     4.58   0.000     .0108077    .026996
    Sportelli_pc |   23.87478   13.34777     1.79   0.074    -2.297944    50.04751
         L00301 |   .0010068   .0001386     7.27   0.000     .0007351    .0012785
    altriout_pc |   8.187778   2.532818     3.23   0.001     3.221348    13.15421
 SpostamentiOUT_pc |  -.7434746    .148846    -4.99   0.000    -1.035337   -.4516127
          PA |   .0899227   .0167852     5.36   0.000     .0570099    .1228356
          PG |   .0897431   .0340746     2.63   0.008     .0229285    .1565577
          PC |   .0413486   .0181038     2.28   0.022     .0058501    .0768471
     reddito_pc |   .0117181   .0036474     3.21   0.001     .0045661    .0188701
   trasf_comp_pc |    .270585   .0653528     4.14   0.000     .1424392    .3987308
      UNIONE |   .1643015   .0427848     3.84   0.000     .0804077    .2481953
  _Iclasse_te_2 |  -.1573476   .0289467    -5.44   0.000    -.2141071   -.1005881
  _Iclasse_te_3 |  -.1075616   .0238121    -4.52   0.000    -.1542532   -.0608701
  _Iclasse_te_4 |   .0615005   .0261249     2.35   0.019      .010274    .1127271
  _Iclasse_te_5 |   .0785142   .0251119     3.13   0.002      .029274    .1277544
         _cons |   6.700009   1.676749     4.00   0.000     3.412187    9.987832
```

Section 2: the "intermediate model"

```
Linear regression                               Number of obs =    2764
                                                F( 16,  2747) =  127.32
                                                Prob > F      =  0.0000
                                                R-squared     =  0.4569
                                                Root MSE      =  .40417

------------------------------------------------------------------------------
             |               Robust
      LOG_Y_pc |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          lpop |  -.1821291   .0140313   -12.98   0.000    -.2096421    -.154616
 PERC_ad_turismo |   1.295432   .1200057    10.79   0.000     1.060122    1.530743
     litoraneo |   .1082681    .030613     3.54   0.000     .0482413    .1682949
 LOG_Pz_personale |   .3856237   .0358421    10.76   0.000     .3153434    .4559039
 LOG_Pz_veicoli_top |   .0744829   .0131859     5.65   0.000     .0486277    .1003381
  LOG_Pz_residuo |   .0603689   .0033038    18.27   0.000     .0538907     .066847
   Pz_veic_x_dum |  -.074369   .0131665    -5.65   0.000    -.1001862   -.0485518
OMI_AFFITTO_MQ_2009_EURO |   .0290497   .0040596     7.16   0.000     .0210895      .03701
         L00301 |   .0020631   .0001514    13.62   0.000     .0017661      .00236
 SpostamentiOUT_pc |  -.6545024   .1415009    -4.63   0.000    -.9319613   -.3770435
          PA |   .0853801   .0178094     4.79   0.000     .0504588    .1203013
   trasf_comp_pc |   .5779196   .0790736     7.31   0.000     .4228699    .7329693
  _Iclasse_te_2 |  -.1478116   .0282918    -5.22   0.000     -.203287   -.0923362
  _Iclasse_te_3 |  -.0567947   .0244564    -2.32   0.020    -.1047495   -.0088399
  _Iclasse_te_4 |   .0810306   .0269524     3.01   0.003     .0281815    .1338797
  _Iclasse_te_5 |   .0534257   .0262371     2.04   0.042     .0019792    .1048723
         _cons |   -.224514   .3928902    -0.57   0.568    -.9949041    .5458761
```

Section 3: the "simple model"

```
Linear regression                               Number of obs =    2764
                                                F(  2,  2761) =   99.37
                                                Prob > F      =  0.0000
                                                R-squared     =  0.1529
                                                Root MSE      =  .50349
```

```
------------------------------------------------------------------------------
             |               Robust
      log_y_pc |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        lpop |  -1.442794   .1030431   -14.00   0.000    -1.644844   -1.240745
       lpop2 |    .081668   .0059046    13.83   0.000     .0700901    .0932459
       _cons |   9.821358   .4431774    22.16   0.000     8.952365    10.69035
```

We can consider two different voting systems:
a) in the first one each Municipality takes part in the collective choice by casting only one vote irrespective of its own demographical size (following the "one Municipality - one vote" rule). In this case, given the number of Municipalities that prefer one model to the other in each pair of alternatives (see Tab. 2, upper section), given that the corresponding resource assignment is greater in the former than in the latter, the resulting preference ordering for all the Municipalities is:

"simple model" $\succ$ "intermediate model" $\succ$ "complex model"

Therefore if the voting system actually adopted is the "one Municipality - one vote" rule, the "simple model" ends up collecting the majority of votes and therefore prevailing as the most preferred one.
b) in the second one each Municipality takes part in the collective choice by casting a number of votes proportional to its own demographical size, or equivalently the citizens of each Municipality directly takes part in voting system (following the "one man - one vote" rule). In this case, given the number of citizens that prefer one model to the other in each pair of alternatives (see Tab. 2, lower section), the resulting preference ordering is:

"simple model" $\succ$ "complex model" $\succ$ "intermediate model"

The "simple model" ends up being the most preferred one in this case too.

Tab. 2 Preferences of Municipalities/citizens on alternative models

	"intermediate" $\succ$ "complex"	"simple" $\succ$ "complex"	"simple" $\succ$ "intermediate"
Net # Municipalities	-242	456	452
Net # citizens	989,839	-12,824,689	-11,018,959

We can investigate this outcome more thoroughly by considering some relevant features of the Municipalities involved in the voting system as, for instance, the population size. The predominance of the "simple model" particularly damages small and middle-sized Municipalities (with population between 2,000 and 10,000 inhabitants): in this group those

suffering losses when the “simple model” is adopted compared to “intermediate model” case exceed those benefitting from this choice (Tab. 3).

Tab. 3 Preferences of Municipalities/citizens on alternative models by Municipal population size: Net # of Municipalities/citizens

Municipal population size	“intermediate” ≻ “complex”	“simple” ≻ “complex”	“simple” ≻ “intermediate”
pop<2000	-69	63	115
pop<5000 & pop>=2000	541	109	-35
pop<10000 & pop>=5000	199	-41	-109
pop<60000 & pop>=10000	-174	2	74
pop<250000 & pop>=60000	-33	-7	1
pop>=250000	-8	6	6
Municipal population size	“intermediate” ≻ “complex”	“simple” ≻ “complex”	“simple” ≻ “intermediate”
pop<2000	102731	104967	82207
pop<5000 & pop>=2000	1830649	308791	-171453
pop<10000 & pop>=5000	1274033	-205497	-648375
pop<60000 & pop>=10000	-5124274	120610	2108124
pop<250000 & pop>=60000	-4104607	262017	1082601
pop>=250000	-6803221	6261619	6261619

In the end whatever voting mechanism is adopted (taking into account the population size of Municipality or not) the financial resources distribution implied by the “simple model” is preferred by the majority of Municipalities to that one produced by the “complex model”. This result is at odds with what suggested by the literature about complexity vs. simplicity in the design of fiscal rules reviewed in Section 1. According to this literature complex fiscal rules are more likely successful than simple rules in mustering support and being accepted by the public and policy makers since it is easy, given the large number of determinants included in those rules, to manage some of those in favour of a large number of specific interests producing a widespread consensus with limited gains for winning jurisdictions. On the contrary the simple rule easily leads to outcomes where a narrow majority of jurisdiction gains a lot at the expense of the minority of losing jurisdictions. The case that we discuss here seems to deny this intuition: the “simple model”, that differentiates financial resources across local jurisdictions less than the “complex model”, gains the majority of votes.

Quite surprisingly the model resulting from the majority voting system (as said the “simple model”) does not match with the model actually developed and proposed by IFEL to the government (as said the “complex model”) for the determination of the expenditure needs indicators. What are the reasons of this divergence? Which criteria (different from majority rule) have been actually used by IFEL in selecting the “complex model”?

We try to tackle this issue following three different approaches. The first one points out the power of specific groups of Municipalities in distorting the outcome of majority voting mechanism in their own favour. Think for example to the role of the political alignment between central and local governments that can bring financial benefit to some Municipalities or the role that the territorial area can play in giving stronger voice in the political arena to certain Municipalities compared to others. We are not able to investigate thoroughly this point given the limitations of our data-set. However some evidences can be derived from Tab. 4 which shows the preferences of Municipalities/citizens on alternative models by territorial area. The Municipalities/citizens located in the Southern Italy are those that would have most suffered if the "simple model" were adopted instead of the "complex model" actually supported by IFEL. Then it is possible that in the choice made by IFEL the pressures of Southern Municipalities have played some role.

Tab. 4 Preferences of Municipalities/citizens on alternative models by territorial area: Net # of Municipalities/citizens

Territorial area	"intermediate" ≻ "complex"	"simple" ≻ "complex"	"simple" ≻ "intermediate"
North-west	208	270	220
North-east	53	181	151
Centre	64	-100	-94
South-west	43	-171	-149
South-east	88	-48	-76

Territorial area	"intermediate" ≻ "complex"	"simple" ≻ "complex"	"simple" ≻ "intermediate"
North-west	-2203047	4011769	3533991
North-east	-3012819	3148687	3251157
Centre	-4511166	890182	1931572
South-west	-1687736	-1139420	-332036
South-east	-1409921	-58711	330039

The second argument we can exploit to rationalize the decision making process used by IFEL refers to the current distribution of per-capita expenditure across local jurisdictions ("status quo"). As mentioned before, current level of per-capita expenditure is the dependent variable for all the regression models considered here. The "complex model", which uses a large number of regressors, implies fitted values of per-capita expenditure which minimize the deviation from the current values for all the Municipalities. Conversely a simple rule, which is more parsimonious in terms of the number of regressors, usually brings about relevant (positive or negative) deviations from the current allocation of resources among local jurisdictions. Now consider that the decision-making process used by IFEL gives weight to the requirement to avoid dramatic departure of standardized values of expenditure with respect to the current levels (a sort of "inertia effect"), and this requirement is asymmetric in the

sense that in the decision-making mechanism adopted by IFEL the political weight of the Municipalities suffering possible looses exceed the political weight of the Municipalities benefitting from possible gains (since, for example, the lobbying efforts of the former are more effective than those of the latter). The result is that the “complex model” prevails over the “simple model”. In other terms the “inertia effect“ produces a bias in the collective choice mechanism towards the “complex model” which ends up being nothing more than a rationalization of the status quo.

This result is confirmed by the case of expenditure needs indicators for local police services considered here. As a matter of fact tab. 5 shows that, comparing the expenditure needs indicators derived from the various models with the status quo, the losses suffered by losing Municipalities (in percentage terms) raise on average when we move from the “simple” model to the “complex” model. As a consequence, if IFEL wanted to avoid large departures (at least on average) in the new distribution of financial resources from the status quo, the preference should go to the “complex” model rather than to the “simple” (or even the “intermediate”) model.

Tab. 5 Losses suffered by losing Municipalities compared to status quo (average of percentage values)

	number of Municipalities	percentage average value
"complex" model	1393	-22.77%
"intermediate" model	1389	-23.75%
"simple" model	1352	-28.57%

Finally it is probable that IFEL, in order to achieve approval from Municipalities, favoured a model that reduces the variance of the deviations of the corresponding resources allocation from the status quo within “peer groups”, that is groups of Municipalities that share some relevant characteristics. The aim of reducing the variance “within peer groups” responds to the principle of reducing “horizontal inequity”, even if here this inequity is probably referred to a limited array of municipal characteristics (usually population size, territorial area, and so on), that not necessarily are those most relevant for explaining differences in expenditure needs indicators.

Tab. 6 gives some evidence that this criterion has actually played some role in the selection by IFEL of the model for determining expenditure needs indicators. Analogously to Tab. 5, we consider again the distribution of percentage losses among those Municipalities that lose in adopting one of the models of expenditure needs indicators compared to the status quo, but here we analyze the variance of those losses by class of demographic size of the Municipalities. Over again we can see that in all demographic groups (except the last one where no Municipality ends up to lose if the “simple” model is adopted) the “complex model” always

dominates the “simple” one if the relevant criterion is to reduce the variance of the deviations from status quo within each group.

Tab. 6 Losses suffered by losing Municipalities compared to status quo (Standard deviation of percentage values)

Municipal population size		number of Municipalities	Std. deviation of percentage values
pop<2000	"complex" model	439	0.1778
	"intermediate" model	455	0.1963
	"simple" model	428	0.2051
pop<5000 & pop>=2000	"complex" model	364	0.1491
	"intermediate" model	312	0.1439
	"simple" model	347	0.1965
pop<10000 & pop>=5000	"complex" model	276	0.1349
	"intermediate" model	260	0.1364
	"simple" model	278	0.1809
pop<60000 & pop>=10000	"complex" model	291	0.1328
	"intermediate" model	323	0.1439
	"simple" model	273	0.1809
pop<250000 & pop>=60000	"complex" model	20	0.1134
	"intermediate" model	32	0.1527
	"simple" model	26	0.1585
pop>=250000	"complex" model	3	0.0224
	"intermediate" model	7	0.1514
	"simple" model	0	0.0000

4. Concluding remarks

This paper investigates the way the collective decision mechanisms affects the adoption of complex vs. simple rules through the analysis of the recent Italian experience on the design of equalization grants at Municipal level.

The results we get are manifold. On the one hand, in a decentralized mechanism of majority voting, a “simple” rule is always preferred regardless if the voting system involves Municipalities or citizens. This happens since majorities are formed on the basis of the number of winners, regardless of the intensity of the gains. Since a “simple” rule determines large losses in the tails of the distribution, it produces a greater number of winners when such tails are not too large, as the Italian case looks like. On the contrary, a “complex” rule is able to better fit the tails than a “simple” one, thus reducing the size of losses at the expenses of the number of winners.

On the other hand, since the choice resulting from the majority voting mechanism does not match with the “complex” model actually supported by the Association of the Italian Municipalities (a sort of “central planner”), we discuss the key factors that may have affected

the choice of the Association and may explain the divergence between the two outcomes. Based on past choices made by the Association about financial matters, we test for a number of factors that could have been relevant in the central planner strategy:
1) the role of specific groups of Municipalities in biasing the outcome of majority voting mechanism;
2) the aim of avoiding too relevant losses (compared to the current distribution of resources) even for a small number of Municipalities;
3) the aim of reducing the variance of losses (compared to the current distribution of resources) within groups of Municipalities that are similar for some relevant characteristics.

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Appendix

lpop "Logaritmo della popolazione"
lpop2 "Log quadrato della popolazione"
lpop3 "Log cubo della popolazione"
A02_pc "Aree pedonali permanenti"
A05_pc "Giorni annui di mercato"
A06_pc "Aree di sosta a pagamento"
iscrizioni_anagrafe_pc "Iscrizioni all'anagrafe"
veic_su_supurb "Veicoli circolanti per km di sup urbana"
presenze_pc "Presenze turistiche"
sec_case_pc "Presenze seconde case"
Scuole_pc "Scuole"
TEMPO_MEDIO_INTERNI_N "Tempo medio pendolari interni al Comune"
visitatori_pc "Visitatori musei"
strade_int_pc "Strade interne"
pend_saldo "Pendolari entranti meno uscenti"
PERC_ad_turismo "% di addetti nel turismo"
litoraneo "comune litoraneo"
LOG_Pz_personale "Log costo del personale per addetto"
LOG_Pz_veicoli_top "Log costo per veicolo di servizio"
Pz_veic_x_dum "---"
LOG_Pz_residuo "Log costo residuo norm."
OMI_AFFITTO_MQ_2009_EURO "Livello medio affitto OMI"
Sportelli_p "Sportelli aperti al pubblico"
L00201 "Quota personale di polizia armato"
L00301 "Gior. annue con serv.notturno"
L00901 "Attività di segreteria (%)"
querele_pc "Querele e denunce°"
altriout_pc "Altri fattori di carico esogeni"
SpostamentiOUT_pc "Perdolari uscenti"
PA "Polizia armata(var. bin.)"
PG "Polizia giudiziaria(var. bin.)"
PC "Protezione civile(var. bin.)"
Densità "Popolazione per kmq"
A01_pc "Accessi ZTL"
mq_pc "Superficie adibita al servizio"
ici_pc "Entrate per ICI"
reddito_pc "Imponibile IRPEF"
Q2_pc "Entrate proprie"
entrate_tot_pc "Entrate totali"

trasf_comp_pc "Trasferimenti e compartecipazione IRPEF"
trasferimenti_pc "Trasferimenti"
compartecipazioni_pc "Compartecipazione IRPEF"
ISTAT_COMUNE_LITORANEO_SN "comune litoraneo ISTAT"
PERC_Incidenti "% incidenti su auto circolanti"