

Fiscal decentralization in a dual country: expenditure needs and equalization in the Italian reform of municipal finance

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1 – Introduction

Since the beginning of the 90s Italy has been implementing a process of fiscal decentralisation. There have been a number of reforms aiming at increasing the fiscal responsibility of local government (regions, provinces and municipalities) and promoting fiscal consolidation.

This paper provides an overview of the on-going reform, started with a law approved in 2009. The reform has recently been implemented with a series of decrees and is meant to be fully in force in 2014. It aims to stimulate higher efficiency in the provision of local public services. Both at the intermediate (regions) and local (provinces and municipalities) levels, expenditure needs will be determined through a formula-based system. Thus, for the first time, funding the multi-tier government will no longer be based on the method of "historical expenditure", according to which expenditure levels are determined in relation to what they were in the past and as a result of the bargaining power of each local government. At the same time the present system of grants will be completely replaced with tax resources (local taxes and different forms of tax sharing). The aim of this change in the funding system is to increase political accountability and fiscal responsibility.

The paper is focussed on the effect if the reform on municipal finance, It is organized as follows: § 2 gives some figures about the decentralization of expenditure in Italy and about the municipal finance; § 3 describes the main geographical and demographic characteristics of municipalities; §§ 4-6 present the empirical investigation: the evaluation of expenditure

needs (§ 4), the evaluation of fiscal capacities (§ 5), the consequences in terms of equalization (§ 6). The last paragraph (§ 7) offers some conclusions.

2. The current system of intergovernmental fiscal relations

In Italy there are three tiers of government. The state at the centre, the regions at the intermediate level and two distinct entities at the local level: provinces and municipalities. Regions are 20, five of them have a larger autonomy guaranteed by a special statute (RSS). Provinces are 111, municipalities 8,094.

Table 1 shows the relative weight of local government in terms of expenditure.

Table 1 - Expenditure for levels of Government (2008)

General government (net of interest payments)	Millions of euro	% of GDP
Central government	354,249	22,59%
Social security	283,800	18,10%
Local government	239,06	15,25%

Local gov. regions with an ordinary status (RSO)	Millis of euro	% of GDP
Regions	136,851	8.73%
Provinces	13,028	0.83%

Local gov. Regions with a special status (RSS)	Millions of euro	% of GDP
Regions	42,872	2.73%
Provinces	1,926	0.12%
Municipalities	14,318	0.91%

Source: National Accounts

Table 2 provides the main items of expenditure and revenue in the balance sheet of municipalities.

Table 2 - The structure of municipal finance (2008)

REVENUE	MI. €	€ per capita	EXPENDITURE	MI. €	€ per capita
Tax revenue	17,890	351	Current expenditure	41,725	820
- Local property tax (ICI)	8,604	169	- Essential functions	38,180	750
- Municipal surtax on IRPEF	2,530	49	- Central services	13,407	263
- Other tax revenue	6,756	132	- Planning & environ.	7,251	142
Grants	25,752	506	- Social services	6,571	129
- Current from State	12,861	252	- Education	4,467	87
- Current from Regions	2,429	47	- Urban transport	3,955	77
- Capital from State	1,382	27	- Local police	2,520	49
- Capital from Regions	3,670	72	- Minor functions	3,556	69
Non-tax revenue	18,874	370	Capital expenditure	25,079	492

Source: Balance Sheets of Municipalities (accrual basis)

3 - The Italian municipalities: geographical and demographic characteristics

Figure 3.1 shows the huge heterogeneity in the structure of Italian municipalities, in terms of size and geographical location. It compares the distribution of municipalities by regions (bars) with the distribution of total population (line). For example, in some regions such as Piemonte, municipalities are very small, conversely in regions such as Puglia municipalities present, on average, a larger size.

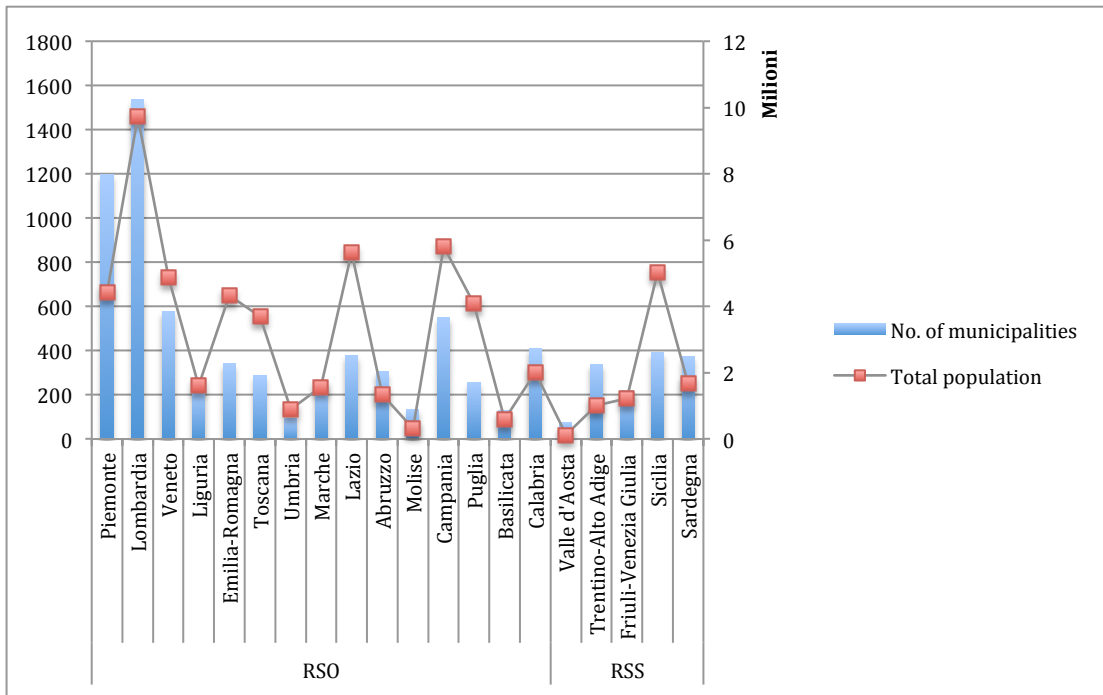


Figure 3.1 - Regional distribution of municipalities and total population

Figure 3.2 shows the distribution of municipalities and of the total population, grouping municipalities in 12 layers. More than 45% of total population live in small municipalities with less than 10000 inhabitants, almost 20% of total population live in municipalities with a number of inhabitants between 20,000 and 60,000, the remaining 35% of total populations live in this last group of municipalities. Only 85 cities present more than 60,000 inhabitants and only ten more than 250,000.

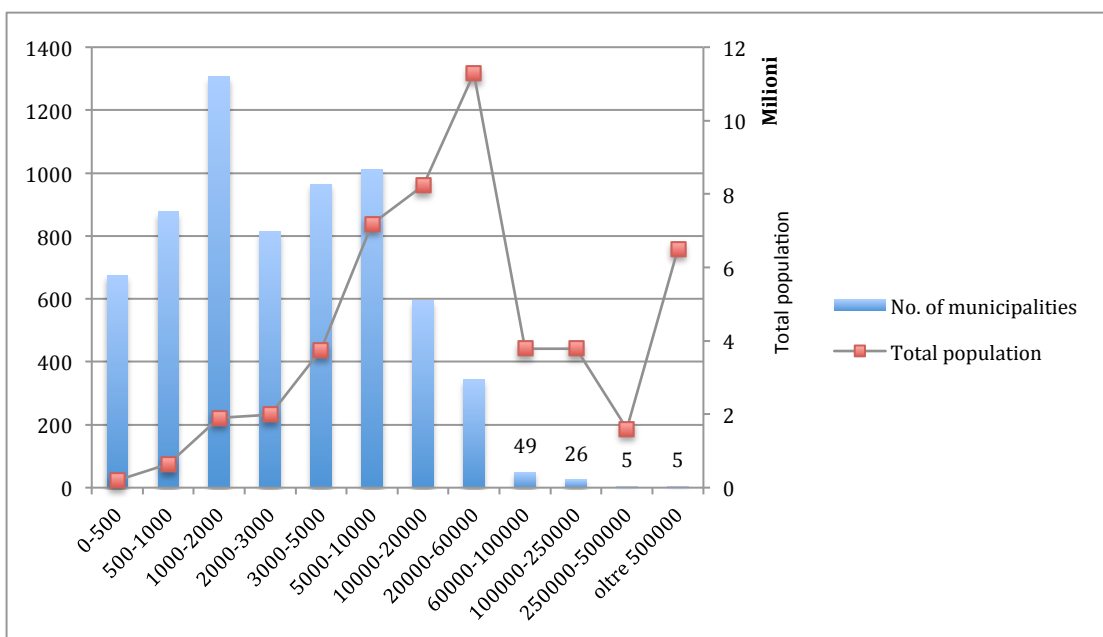


Figure 3.2 - Distribution of municipalities and total population by population brackets

Since GDP values are not available at the municipal level, the declared income for tax purposes is the only measure of income available at municipal level. Figure 3.3 shows that municipalities located in the southern regions (both RSO and RSS) are characterized by an average declared income below the mean, a result of the dual structure of the Italian economy.

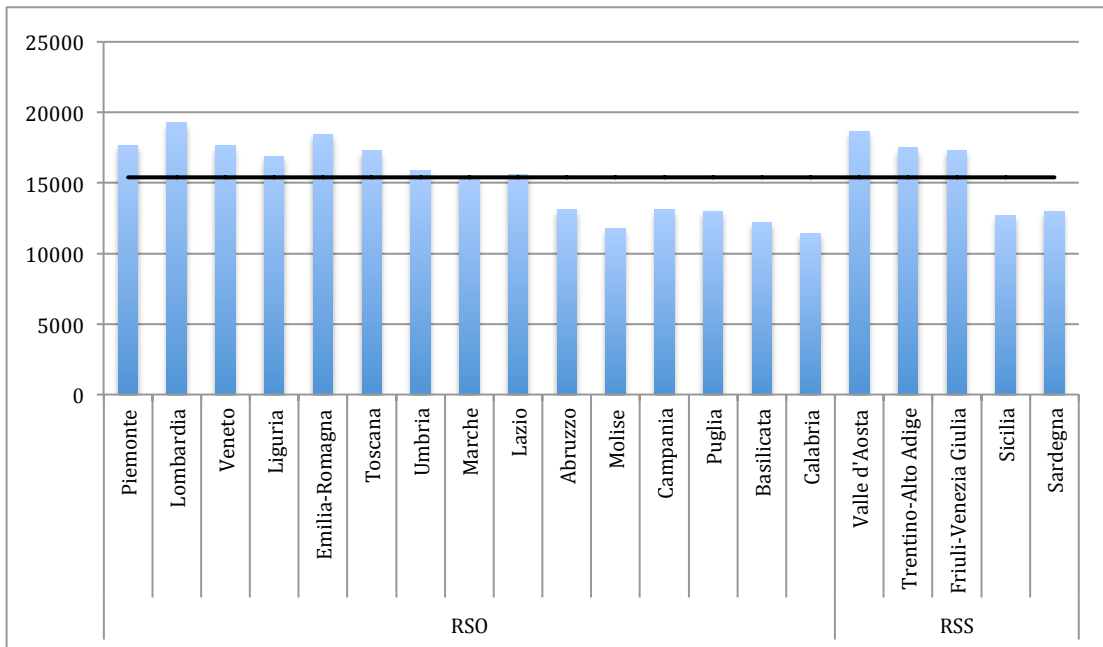


Figure 3.3 – Regional distribution of declared income for tax purposes (year 2008)

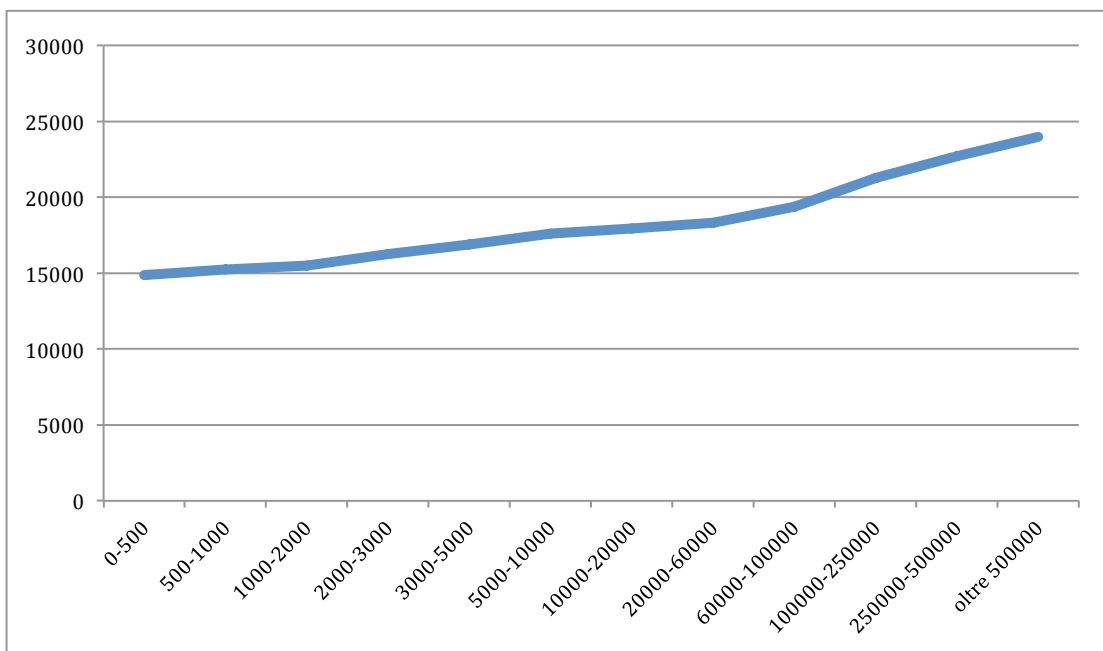


Figure 3.4 - Distribution of declared income for tax purposes by population size (only RSO, year 2008)

Figure 3.4, instead, reports the distribution of the declared income, after grouping municipalities in 12 different population brackets. In general there is a clear positive relationship between income and population size. This relationship will have an important impact in the estimation of expenditure needs and the computation of equalization grants.

4 – The evaluation of expenditure needs

The evaluation of expenditure needs can follow two main possible approaches.

1. Cost function approach

Two alternative empirical strategies:

- a. Estimation of a structural model of demand and supply of local public goods (LPG)
 - b. Instrumental Variables to tackle the endogeneity of the output quantities (local public good) in the cost function
- Both strategies are very difficult to implement and the estimates rely on many assumptions (e.g. good instruments etc.)
 - High risk of biased point estimates

2. Expenditure function approach

- reduced form model of supply and demand of LPG
- The level of LPG in the cost function is replaced by the determinants of the demand for LPG (income and environmental variables such as the demographic structure which determine local preferences)
- There are no problem of endogeneity because on the RHS of the model there are only exogenous variables
- The risk of biased point estimates is very low
- It is not possible to estimate the direct relationship between output and expenditure

Using the expenditure function approach, the final empirical model corresponds to the following **linear panel data model**

$$E_{it} = \phi y_{it} + \lambda h_{it} + \beta D_{it} + \gamma S_{it} + \alpha_i + \eta_t + \varepsilon_{it}$$

- where: E = total expenditure for essential functions, y = average municipal income, h = average municipal premises rent, D = vector of environmental variables related to the demand of LPG, S = vector of environmental variables related to the supply of LPG, α = municipal fixed effect, η = set of year dummies, ε = homoskedastic error term, i = municipal index, t = year index

- All variables are in per capita or unit terms

- Cross-sectional dimension = 3669; 85% population ≥ 15000 , 78% $5000 \leq \text{population} < 15000$, 44% population < 5000 ; 83% of total population

- time dimension = 5 years from 2001 to 2006

- Estimator = Generalized Least Square (Mundlak's approach is used to capture the correlation between the regressors and the unobserved heterogeneity)

In Table 3 the descriptive statics are reported, while Table 4 shows the parameters point estimates.

The sample includes almost 90% of the local authorities, with more than 5,000 inhabitants and around 50% of small municipalities. As a result the cross section dimension of our dataset will count almost 4,000 municipalities. The time series dimension of the dataset spans over eight years period, from 2001 to 2008.

Table 3- Descriptive statistics

Variables	Unit of measure	Mean	Std.Dev.
Current expend. essential functions	€ per capita	750	395
Resident population	No.	7388	42548
Monthly rents (offices located in the city centre)	€ per square meter	58	32
Declared income (IRPEF tax returns)	€ per taxpayer	15882	3678
Registration and deletions in the register of births marriages and deaths	No. per 1000 inhabitants	86	29
Daytime population (commuters)	No. per 1000 inhabitants	8	59
Accommodation capacity	No. of beds per 1000 inhabitants	103	395
Net elderly population (Pop. > 65) - (Pop. < 16)	% of total population	9	9
Illiterate people	% of total population	1.6	2.2

Urban car accident	No. per 1000 inhabitants	3.2	3.2
Vehicles	No. per 1000 inhabitants	745	115
Population density	Inhabitants per hectare	3.1	6.7
Private service sector workers	% of total number of workers	28	7
Public service sector workers	% of total number of workers	22	8
Self-employed workers	% of total number of workers	25	6
Bank counters	No. per 1000 inhabitants	676	456
Energy plan approved	Dummy 1 = yes	0.02	0.16
Altimetric zone =plain, 5 = high mountain	Discrete variable	2.9	1.5
Rural degree 1=low, 3 = high	Discrete variable	2.3	0.7
Mountain area	Hectares	17	32

Table 4 Parameters point estimates

Variables	Interpretation	Parameter type	Point estimates	Robust standard errors
Declared income (IRPEF)	€ per 1000 euro of income	ϕ	5.8552***	[1.1391]
Monthly rents	€ per square meter monthly rents	λ	0.5027***	[0.1531]
Monthly rents square		λ	0.0038***	[0.0008]
Registration in the register of births	€ per registration	β	0.8216***	[0.1026]
Daytime population	€ per commuters	β	6.9139***	[0.6787]
Daytime population square		β	-0.0011***	[0.0003]
Accommodation capacity	€ per bed	β	0.3624***	[0.0287]
Net elderly population	€ per person	β	3.6812***	[0.5872]
Net elderly population square		β	0.0787***	[0.0273]
Illiterate people	€ per person	β	12.8199***	[4.0872]
Urban car accident	€ per event	β	4.0088***	[1.0056]
Vehicles	€ per vehicle	β	0.1364*	[0.0705]
Private service sector workers	€ per worker	β	1.6578***	[0.4229]
Public service sector workers	€ per worker	β	3.0122***	[0.3190]
Self-employed workers	€ per worker	β	2.0778***	[0.4256]
Bank counters	€ per bank counter	γ	0.0910***	[0.0187]
Energy plan approved	€ if approved	γ	21.6558***	[7.9096]
Population density	€ per person	γ	1.8782***	[0.1920]
Resident population	€ per capita	γ	-8.8199***	[0.9263]

Resident population square		γ	0.0019***	[0.0006]
Altimetric zone	€ per point	γ	11.7488***	[1.3056]
Rural degree 1=low, 3 = high	€ per point	γ	17.7173***	[3.6004]
Mountain area	€ per per hectares	γ	0.8124***	[0.1091]
Mountain area square		γ	-0.0024***	[0.0003]

The evaluation of the “*theoretical per capita expenditure needs*” (*TPNeeds*) for each municipality i is done using the fitted values

$$TPNeeds_i = \hat{\phi}\bar{y}_i + \hat{\lambda}\bar{h}_i + \hat{\beta}\bar{D}_i + \hat{\gamma}\bar{S}_i$$

- municipal fixed effects α are excluded because they capture the level of council inefficiency
- year dummies η are excluded because they capture the general fluctuation of expenditure common to all municipalities
- All variables (y, h, D, S) are averages between 2001 and 2007
- Average values have been preferred to 2008 values because of the lack of data for many municipalities in 2008

The evaluation of per capita expenditure needs (*PENeeds*) of each municipality is done in three steps.

Computation of the coefficient of apportionment R_i for each municipality i :

$$R_i = \frac{\text{population}_i \cdot TPNeed_i}{\sum_{i=1}^N \text{population}_i \cdot FPT_i}$$

Computation of total expenditure needs for each municipality ($Eneed_i$)

$$Eneed_i = R_i \cdot \sum_j T_j$$

- where $T_i = 2008$ current expenditure for essential functions
- however, $\sum T_i$ can change according to the comprehensive budget constraint imposed by the central government

Finally, per capita expenditure needs correspond to:

$$PEneed_i = \frac{Eneed_i}{\text{population}_i}$$

Figure 4.1 shows that the distribution of the estimated expenditure needs in terms of population brackets is very close to that one of the “historical” expenditure. This means that the variables used in the empirical model do capture very well the variability in the “historical” expenditure. It can be seen that provision of local services by Italian municipalities is characterized by significant economies of scale until a given level of population, above which diseconomies prevail: the function reminds a long rung average cost function of a single firm. Only at the two end points of the distribution it is possible to observe some differences between “historical” expenditure and expenditure needs, that can be attributed to the presence of inefficiency.

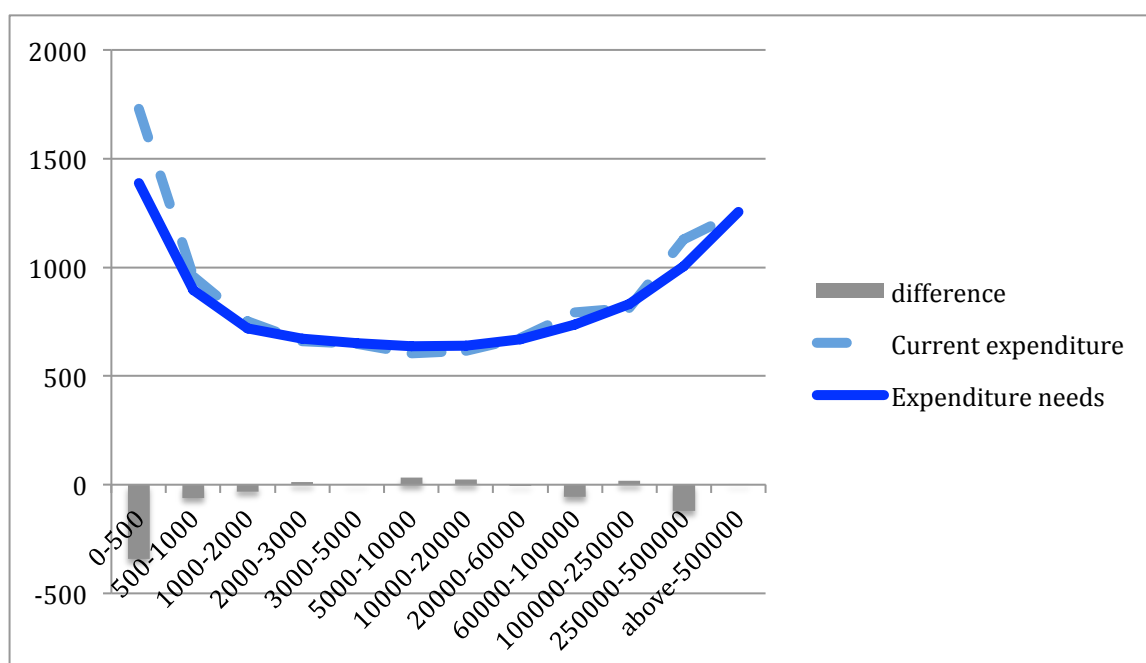


Figure 4.1 Expenditure needs and historical expenditure by population size

Figure 4.2 measures on the vertical axis the per capita expenditure, both historical and estimated, and on the horizontal axis the 15 ordinary regions ordered from the North to the South of the country. As already seen in Figure 4.1, the distribution of the estimated expenditure needs is very close to the distribution of the historical expenditure. Moreover the figure seems to indicate that there is not a strong correlation between inefficiency and regional location of municipalities. Apparently, only municipalities located in central regions are more efficient.

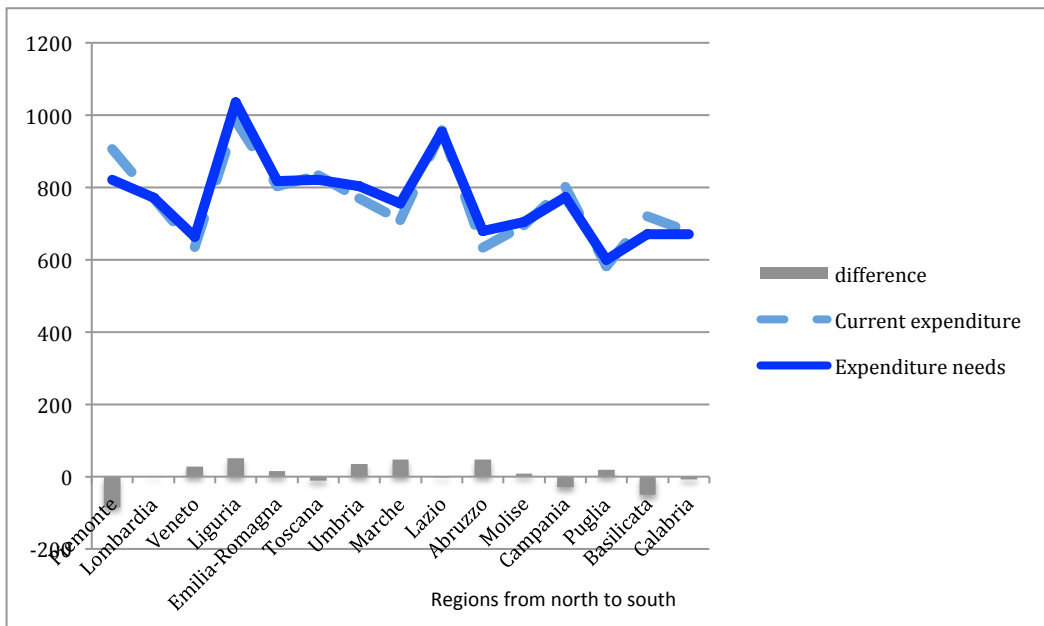


Figure 4.2 The regional distribution of expenditure needs and historical expenditure

5 - The evaluation of fiscal capacity

Table 5 - The evaluation of fiscal capacity: sources and methods

	Source / computation
Municipal VAT (share)	Ministry of Finance
Municipal property tax (IMu)	Estimated total revenue apportioned by municipal property fiscal capacity
Withholding tax on rents (share)	Ministry of Finance
Personal income tax and stamp duty on rents.	Estimated total revenue apportioned by municipal property fiscal capacity.
Registry tax (share)	$9\% \times \text{normal tax base} + 2\% \times \text{special tax base}$
Secondary municipal tax	2001-2007 average revenue of repealed taxes
Municipal surtax on IRPEF	$0.4\% \times \text{municipal personal income tax base}$
Fees on waste management and other essential services	2001-2007 average revenue of existing taxes
Other taxes	2001-2007 average revenue of existing taxes

Table 6 – The evaluation of fiscal capacity: estimated tax revenues

		€ per capita	% of J
A	Municipal property tax (IMu)	210.5	31.49
B	Personal income tax and stamp duty on rents	78.69	11.77
C	Municipal VAT (share)	57.25	8.56
D	Municipal surtax on IRPEF	49.18	7.36
E	Registry tax (share)	25.97	3.39
F	Secondary municipal tax	17.09	2.56
G	Withholding tax on rents (share)	14.51	2.17
H	Fees on waste management and other essential services	195.83	29.3
I	Other taxes	19.43	2.91
J	TOTAL FISCAL CAPACITY	668.46	100
K	FISCAL REVENUES (related to essential functions year 2008)	500.44	74.86
L	CURRENT EXPENDITURE (essential functions year 2008)	767.52	114.82
	Total population (municipalities in the sample)	42,193,668	
	Total population (RSO)	50,881,657	

Two main results can be drawn from the evaluation of the fiscal capacity:

1) First, in line with the declared goals, the reform produces a considerable increase in tax revenues with respect to 2008 figures. The increase is evaluated in 168 euro per capita;

2) However, this increase is not sufficient to finance the total “historical” expenditure that, in per capita terms, results almost 100 euro higher than the fiscal capacity. As a consequence, according to our estimates, a correct implementation of the reform, which as we have seen should imply a complete abolition of grants other than those with equalizing nature, would require either a cut in the total expenditure or a further increase of tax capacity. Otherwise the equalization fund will include a spurious component, i.e. not referable to equalization purposes.

Figure 5.1 shows that both the estimated tax revenue (fiscal capacity) and the 2008 tax revenue show the same distribution in terms of population size: thus the reform will increase the tax revenue uniformly in all municipalities independently on their size; only municipalities located at the end points of the distribution seem to benefit to a larger extent. It is worth noticing that the distribution of the fiscal capacity follows the same U shape of the

expenditure needs, in contrast with the distribution of the declared income, which has been reported above: this can be explained considering that the new tax capacity is mainly linked to real estate income.

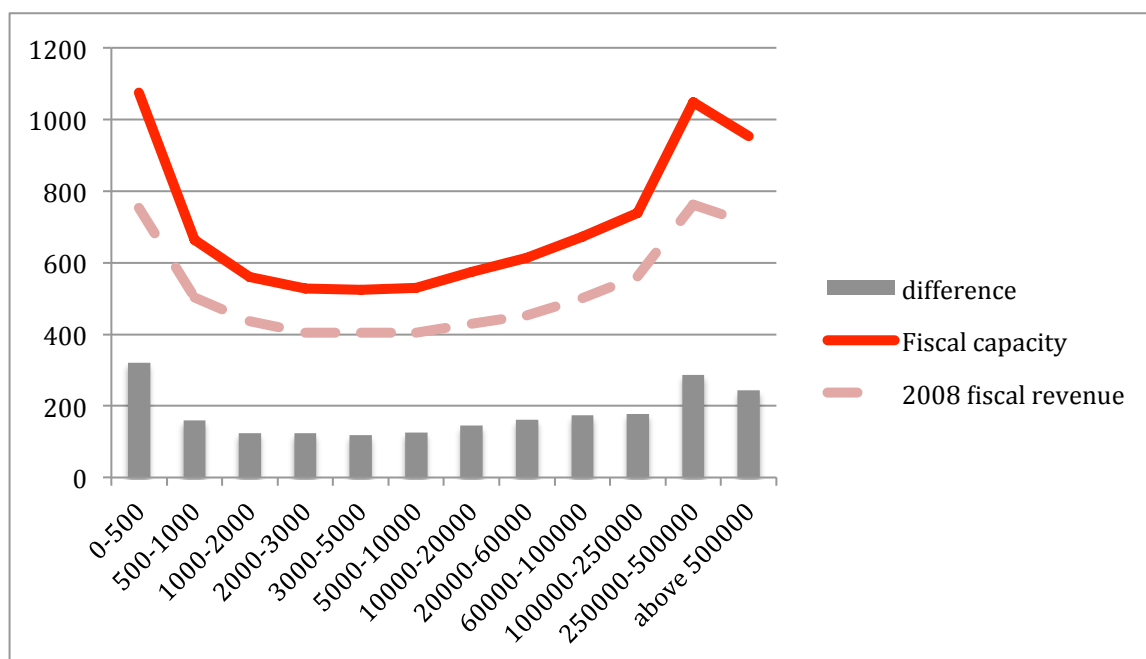


Figure 5.1 - Present and estimated tax revenue distribution by population size

Likely to Figure 5.1, Figure 5.2 shows that the regional distribution of estimated tax revenue and that one of the 2008 actual tax revenue have the same shape. However, it can be seen that the reform will benefit more the municipalities located in the North, where tax revenue will increase more. Moreover, this picture shows the duality of the country in terms of tax capacity: all northern regions present figures above the mean, conversely all southern regions presents figures below the mean.

6 - Two possible models of fiscal equalization

A well known design of fiscal equalization according to expenditure needs (for example Bird, 1993) requires that the standard rates of SCGs taxes and the formulas of tax sharing are set at the level necessary to provide the richest SCG with an amount of tax revenue just sufficient to cover its expenditure needs. The tax resources of all the other SCGs must be integrated with equalizing grants. This model will be applied in the following with reference to the Italian reform and denoted as *hypothesis 1* (H1). The fiscal capacity resulting from the reform is recalibrated in order to balance tax revenue and expenditure needs of the richest municipality. This is obtained setting at 22% the share of the withholding tax, PIT and stamp duty on rents, and at 18% the share of the registry tax. It must be noticed that, according to this approach, not all the grants have an exclusive equalizing nature, because in

the aggregate the tax revenue falls short of the expenditure needs: there is a component of transfers directed to fill the gap.

An alternative hypothesis can be considered: setting the standard tax capacity at the level necessary to balance tax revenue and expenditure needs at the aggregate level. Under this hypothesis, referred to in the following as *hypothesis 2* (H2), the municipalities with larger fiscal capacity will obtain a tax revenue larger than their expenditure needs. The grants flowing to municipalities having insufficient tax capacity will be of a purely equalizing nature. It must be noticed that the overall amount of resources (tax revenue + grants) assigned at the sub-central level will be greater than under H1. This second model will be applied with reference to the Italian case setting at 100% the share of the withholding tax, PIT and stamp duty on rents, and at 80% the share of the registry tax.

In the following, the structure of grants under the two hypotheses and the pre-reform situation (2008) will be compared. Table 7 provides the correlation matrix of the three grants structures and a series of variables.

All kinds of grants exhibit the same degree of positive correlation with the geographical location and with the expenditure needs. They also show a similar degree of negative correlation with the declared income and the 2008 fiscal revenue. As a result, all types of grants structures benefit more the municipalities located in the South (the poorest part of the country). Grants are weakly correlated with expenditure needs. The correlation is higher under H1 than under H2: this was expected, because in the former case a component of grants has a funding, rather than an equalizing, nature. Some differences in correlation indices can be found in relation with the post reform tax revenue: the degree of negative correlation is much weaker in the case of the present grants structure.

With reference to the “historical” expenditure, the present grants structure (2008) exhibits a positive correlation, whereas both the equalization hypotheses exhibit no correlation at all. This last result shows that an important function of the present grants structure is to finance expenditure, while in the reformed system grants will mainly have an equalization function.

Finally, none of the grants structure is correlated with the resident population, mainly because the relationship between grants and population size is non linear, as shown below in figure 6.2

Table 7 – Correlation matrix

	Grants pre-reform	Hypothesis 1	Hypothesis 2
Geographic position (north-south direction)	0.3889*	0.3341*	0.3811*
Expenditure needs	0.2095*	0.2840*	0.1389*
Declared income	-0.6656*	-0.5610*	-0.6047*
Tax revenue pre-reform	-0.3143*	-0.4826*	-0.5056*
Tax revenue post-reform	-0.2528*	-0.5059*	-0.5221*
Historical expenditure	0.3309*	-0.0551*	-0.0488*
Resident population	0.026	0.0158	-0.0267
Grants pre-reform	-	0.6035*	0.6425*
Second hypothesis	0.6425*	0.9079*	-

We can evaluate the different impact of the two hypotheses in term of distribution of *expenditure capacity*, defined as the sum of tax revenue and grants.

Given a Gini index of 0.11 in the distribution of expenditure needs, in H1 the Gini index of expenditure capacity is just slightly higher. Instead, in H2 it increases up to 0.16. It must however be noticed that the total amount of grants in the latter case is more than twice the one resulting in the former hypothesis. In a dual country as Italy the cost, in terms of funds from the central government, is necessarily high (Table 8).

Table 8 – The distributional consequences of the two schemes of equalization

$E_{need_i} = R_i \cdot \sum_j T_j$	H1	H2
Gini index in the distribution of expenditure needs	0.11	0.11
Gini index in the distribution of expenditure capacity	0.12	0.16
Equalization fund	3.9 billions euro	9.3 billions euro

Figure 6.1 shows the composition of financial resources necessary to finance total expenditure needs, comparing the present situation with H1 and 2. In the case of H 2, the

equalization fund is only 10% of the total expenditure needs. Instead, under H1, the equalization fund jumps to 24%, slightly lower than the present 30%.

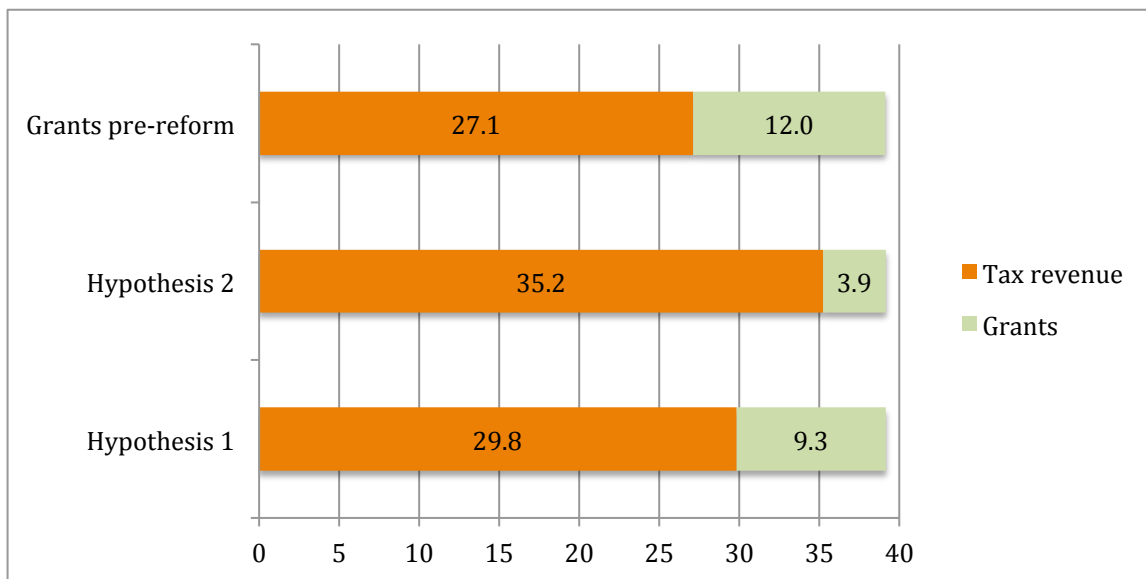


Figure 6.1 – The composition of SCGs financial resources

Figure 6.2 represents the distribution, by population brackets, of per capita equalization grants (H1 and 2) in comparison with the distribution of the present intergovernmental grants. H1 follow more closely the U shape than present grants, instead H2 presents a decreasing path with the only exception of the cities with more than 500,000 inhabitants. However, with few exceptions, in both cases the municipalities located at the end points of the distribution seems to lose more resources, especially in case of H1.

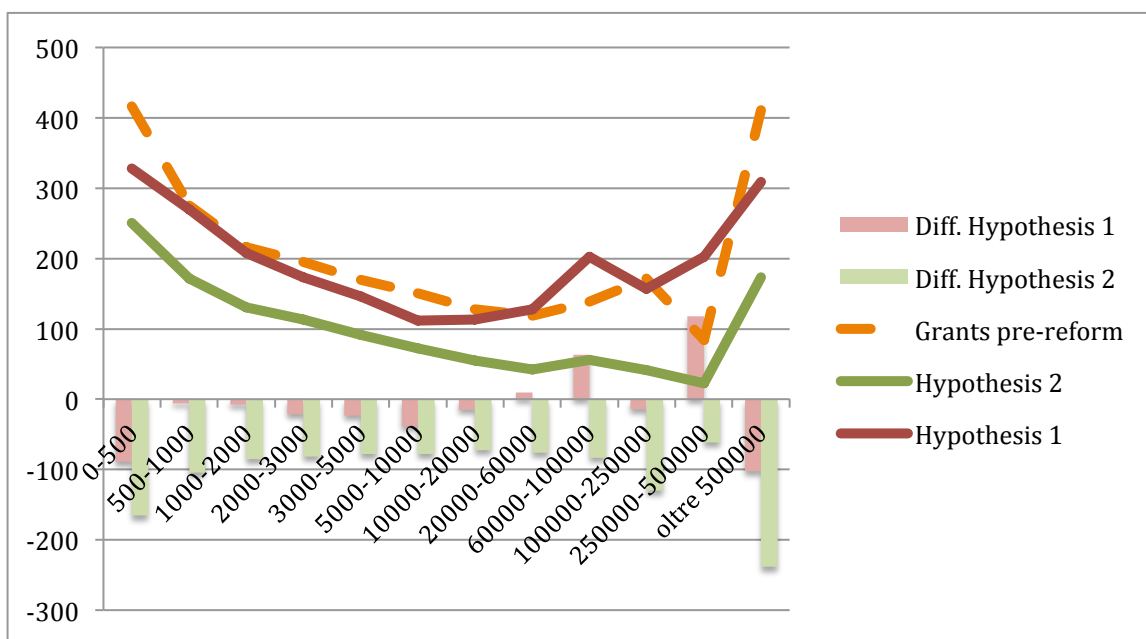


Figure 6.2 – Distribution of per-capita equalization grants by population size

Figure shows the regional distribution of per capita equalization grants (H1 and H2) in comparison with the distribution of the present intergovernmental grants. It can be noticed that grants follow a similar pattern in all the three scenarios, both respect to the geographical trend, in favour of South, and in the regional gaps within each geographical macro-area (North, centre, South).

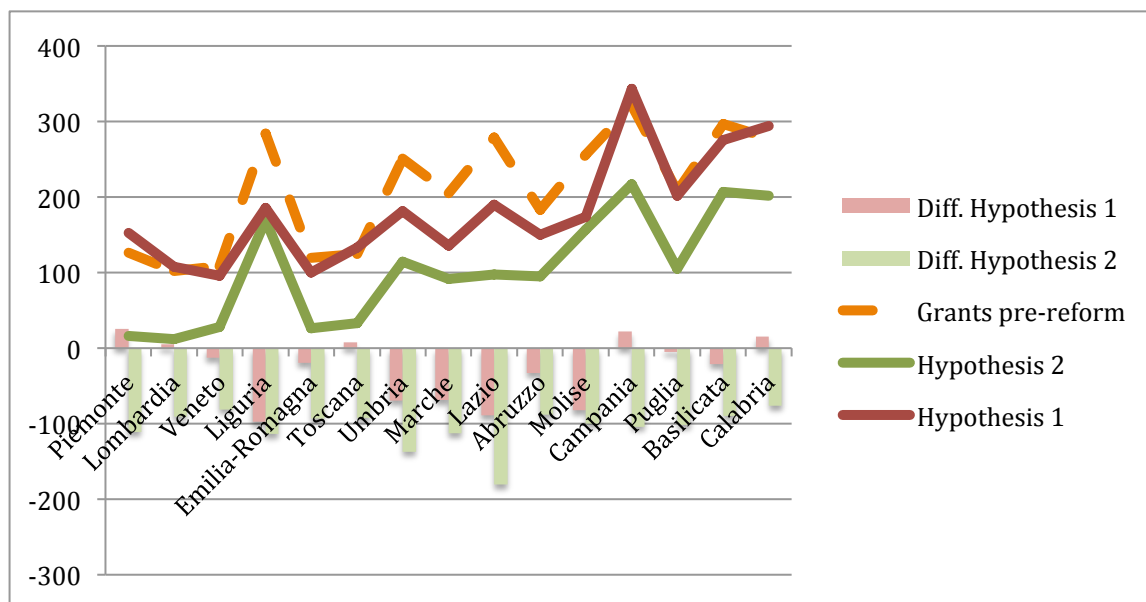


Figure 6.3 - The regional distribution of per capita equalization grants

7 - Conclusions

The reform of intergovernmental fiscal relations, which is presently being implemented in Italy, aims to enhance fiscal responsibility of SCGs by abolishing grants as an ordinary means of finance. However, the movement from grants to tax revenue exacerbates the fiscal consequences of the huge disparities in income levels over the Italian territory, especially over the North-South dimension.

Considering that the Italian Constitution (art. 117) establishes that certain “essential services”, associated with basic citizenship rights, must be provided uniformly all over the country, the reform has huge equalisation requirements.

In the paper expenditure needs and fiscal capacities of Italian municipalities have been estimated in the scenario depicted by the reform and their consequences in terms of equalization have been investigated. We have shown that estimated expenditure needs are very close to “historical” expenditure, the few significant differences being imputable to inefficiency. The evaluation of municipalities’ fiscal capacity shows that the reform will effectively produce a considerable increase of tax resources. However fiscal capacity is not set

in the aggregate at a level sufficient for financing the total “historical” expenditure: a correct implementation of the reform should thus imply either a cut in expenditure or an increase in fiscal capacity.

Finally two different equalizing schemes have been compared. Given the dual structure of the country, the reduction of inequality in the distribution of municipal expenditure capacity is very costly in terms central resources: grants of about 1.35 billions of euro are necessary to reduce by one percentage point the Gini index.