

Article

# Can Local Policies Reduce the Gap between ‘Centers’ and ‘Inner Areas’? The Case of Italian Municipalities’ Expenditure

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**Abstract:** This study analyzes the links between Italian inner area municipalities’ expenditure and per capita incomes, considered as a proxy of well-being. Inner areas are territorial contexts characterized by a significant distance from the centers, the main supply poles of essential services. Following a top-down approach, the paper at first demonstrates the existence of a global convergence process in per capita incomes, with a faster rate of convergence in inner areas with respect to centers; then, attention is focused on local administrations’ policies and their impact on incomes in Italian inner areas. The paper gives a twofold contribution to the debate about the implementation of territorial cohesion policies: (a) on one side, public expenditure data are considered for the first time in an econometric model regarding Italian inner areas; (b) on the other side, the reference territorial subdivision is the lowest possible, giving the opportunity to investigate the changes in well-being at the finest scale.

**Keywords:** local public expenditures; per capita incomes; Italian inner areas; spatial error model; panel regression model

**JEL Classification:** R58; H72; C33

## 1. Introduction

This paper proposes an analysis of the relationships between Italian local administrations’ policies and incomes at the municipality level (LAU2, Local Administrative Units of territorial units nomenclature) in years 2008–2016, that is, the years following the global crisis that started in 2007.

During these years, the Italian economy experienced a decrease in GDP, an increased unemployment rate ([World Economic Forum 2017](#)), an increased poverty rate, both absolute and relative, and also augmented inequalities ([ISTAT 2018](#)). All of these indicators are strong determinants of well-being levels, which depend on the presence/absence of environmental, social, and economic resources and public and private services ([Stiglitz 2012](#); [Seery and Arendar 2014](#)). In this respect, there has been much debate in recent years regarding a new definition of ‘sustainable well-being’ ([Costanza et al. 2016](#)). Starting from the UN Sustainable Development Goals, a composite well-being index should include many different indicators, among which, as an example, life expectancy at birth, leisure, poverty risk reduction, and quality of environment ([Eurostat 2018](#)). In any case, income remains the main component of well-being ([OECD 2013](#)), and it plays a central role in explaining territorial disparities.

Italy presents significant differences in incomes at a territorial level ([Viesti 2016](#)). These inequalities are due to the historical North–South gap ([Felice 2015](#)), as well as to the uneven development between cities and rural areas ([Fabiani 2015](#)), plains and mountains ([Fondazione Montagne Italia 2016](#)), coast and inland ([Cialdea and Mastronardi 2014](#)), and centers and inner areas (IAs) ([Barca et al. 2014](#)).

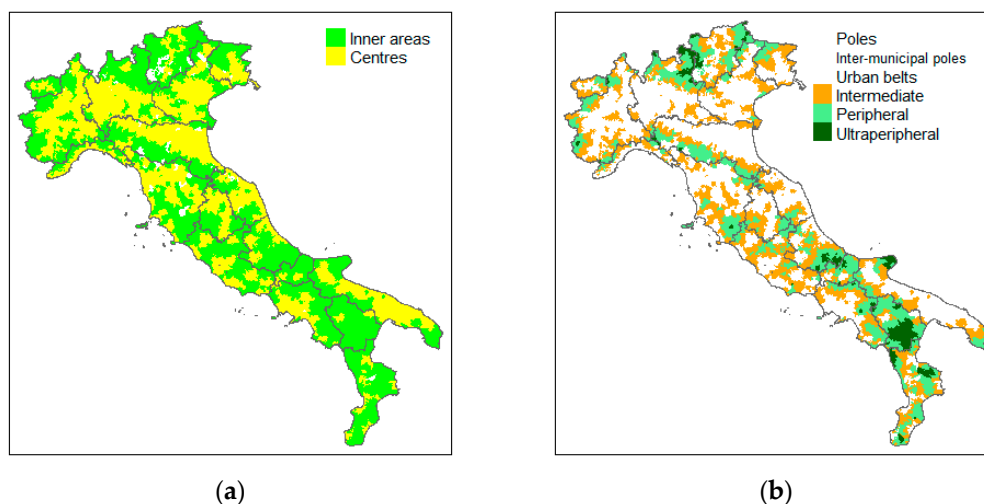
The specificity of the territorialization method, as applied to inner areas, is the overcoming of the classical juxtaposition between cities and countryside (Lucatelli and Peta 2010). The gravity center may be a small municipality or even several neighboring municipalities capable of offering essential public services. On the other hand, a city can be classified as an inner area if it is not able to offer adequate citizenship services (Lucatelli 2016).

Inner areas classification makes use of descriptive indicators referring to the degree of spatial peripherality of these territories with respect to the accessibility of essential services (health, education, mobility), under the hypothesis that it may condition the quality of life for citizens, their degree of social inclusion, and even their economic potential (Carlucci et al. 2012). The detection of inner areas thus relies on a polycentric Italian territorial reading, that is, a country characterized by a network of municipalities or aggregations of municipalities (service supply poles), around which areas gravitate with different degrees of spatial peripherality.

The methodology adopted by Strategia Nazionale Aree Interne (SNAI, in English Inner Areas National Strategy) consists of two major phases:

1. Identification of the poles, according to their ability to offer some essential services; and
2. Classification of the remaining municipalities into four groups: urban belt areas; intermediate areas; peripheral areas; and ultra-peripheral areas, based on the respective distance from the poles. The last three groups are defined as “inner areas”, and the others are defined as “centers”, as shown in Figure 1a.

The final mapping is mainly influenced by two factors: the criteria underlying the detection of the service supply poles, and the choice of the distance thresholds to measure the degree of peripherality of the municipalities. In this regard, inner areas classification has been obtained on the basis of an indicator of accessibility calculated as the time (in minutes) required to reach the nearest pole, as shown in Figure 1b. In particular, intermediate areas are those whose distance is between 20 and 40 min; peripheral areas are those whose distance is between 40 and 75 min; and ultra-peripheral areas are more than 75 min away from the nearest pole.



**Figure 1.** SNAI 2014 classification of Italian municipalities: (a) SNAI 2014 macro-classes; (b) SNAI 2014 classes (in colors, the 3 inner areas categories).

Inner areas policies are part of a strand which, in Italy, has a long tradition (Mantino and Lucatelli 2016). This policy has always had, as its primary object, mountain and rural areas; however, it has obtained rather limited results in terms of social and economic growth (Marino et al. 2017).

The policies for inner areas have their main theoretical reference in the Keynesian approach. This approach is set into a context where there is not full employment of the existing production

potential. In this context, only public intervention can remove the lagging conditions (Harrod 1939; Domar 1957; Kaldor 1955; Lucas 1988; Romer 1986).

Inner areas have recently been the subject of specific policies, which find their main reference in the SNAI (Dipartimento per lo Sviluppo e la Coesione Economica DPS). SNAI relies upon a place-based approach (Barca 2009). It starts from the observation that the impact of public investments is differentiated at a local scale, and infers that the success of the interventions is influenced by the characteristics of the context, such as productive specialization, urban quality, cultural atmosphere, and efficiency of local institutions. The main purpose of the SNAI is to invert the negative demographic trend afflicting inner areas. In connection with this, a 'long-term strategy intended to face the ongoing under-use of resources and to reduce the persistent social exclusion in specified places by means of external interventions and a multilevel governance' is planned.

In 2014, when SNAI was defined, there were 4185 municipalities classified as inner areas, which represented almost 52% of total Italian municipalities. The resident population amounted to more than 13 million inhabitants (approximately 22% of the national population), mainly residing in small municipalities. SNAI acknowledges the role of municipalities in inner area development. Municipalities 'constitute the basic unit in the public policies decision process and, in the form of aggregations of neighboring municipalities—inter-municipal local systems—they are privileged partners for the implementation of growth strategies' (Dipartimento per lo Sviluppo e la Coesione Economica DPS).

Local growth-oriented policies play a fundamental role in providing essential services (Petretto 2014). Following the prescriptions of Italian constitutional law, municipalities have been given many fundamental functions: (a) administration, financial management, accounting, and control; (b) supply of public services in municipal areas (i.e., economic development funding), including public mobility; (c) planning and housing; (d) civil protection; (e) waste disposal services; (f) welfare services supply; (g) school facilities; (h) safety of citizens; and (i) keeping of registry offices. Moreover, regions can transfer to municipalities certain other functions, such as conservation of natural resources and landscape preservation. In light of these competencies, municipalities play a key role in the reconstruction of the vitality of local communities and in the correction of the declining population trend (IFEL 2018).

Municipalities' expenditure in 2014 amounted to roughly €64 billion, 7.7% of total public administration (PA) expenditure (Cottarelli 2016). This is a significant amount, although it represents only 39.5% of regional expenditure (€162 billion). Municipalities' expenditures have a multisectoral valence, while regions spend their budget primarily on health care.

In this scenario, the aim of the paper is to evaluate the possible effects of public expenditure on the variations of the per capita incomes—taken as a proxy of well-being levels—of IAs residents.

The literature has devoted a great deal of attention to the issue of the relationships between the amount of public expenditure and economic growth at a country level (Modigliani and Sterling 1986; Barro 1990; Butkiewicz and Yanikkaya 2011; Wu et al. 2010). Researchers have differentiated between productive and non-productive government expenditure, and have shown how a country can increase its economic growth by changing the mix between these alternative forms of expenditure (Gemmell et al. 2015; Chu et al. 2018).

To our knowledge, there are no studies performed on the relationship between public expenditure and income at municipal detail, as well as research focused on the detailed composition of expenditure at the finest territorial partitioning.

In light of this framework, in which public policies are aimed at reducing regional inequalities, it is reasonable to ask the following research questions (RQs):

RQ1: Are incomes converging at the municipality level, with special attention to the distinction between inner areas and centers?

RQ2: With reference to Italian inner areas, can local administrations' policies have positive effects on per capita incomes?

The contribution of the present paper is twofold: (a) on one side, public expenditure data are introduced for the first time in an econometric framework concerning Italian IAs; (b) on the other side, the reference territorial subdivision (municipality) is the lowest possible, giving the opportunity to investigate the changes in well-being at the finest scale.

The paper is structured as follows: Section 2 gives details regarding data collection, the variables employed, and the methods involved; Section 3 presents the results and analyzes the convergence process and the effects of public expenditure on per capita incomes; Section 4 concludes the study with some final remarks.

## 2. Dataset and Methods

The data taken into account in our study are: (a) the per capita incomes at the municipality level, resulting from the Revenue Agency public database; and (b) the budgets of municipalities, in particular, for what concerns expenditure, as subdivided in the so-called ‘Missions’.

The basic assumption underlying our study is that these expenditure categories may have effects on per capita income levels.

Budget data have been gathered on the Aida PA database of Bureau van Dijk. The reference years are 2008 and 2016; in this latter case, all of the values have been converted to constant 2008 price values. It is important to specify that we have been compelled to remove from our analyses the two biggest Italian islands, Sardinia and Sicily, owing to problems in linking the municipality codes in the two databases, and in the two different years considered. The total number of continental Italy municipalities amounts to 7129; 3448 of which are classified as inner areas, and 3681 of which are classified as centers.

On the basis of the RQs presented in Section 1, we have applied the following methods:

RQ1. Initially, we analyzed the per capita income convergence, on the basis of a simple conditional model (Barro 2000) with the following form:

$$\frac{1}{\Delta t} \ln(Y_{t_1} \oslash Y_{t_0}) = SNAI + NUTS1 + \beta \ln Y_{t_0} + \varepsilon \quad (1)$$

where the symbol  $\oslash$  denotes Hadamard (elementwise) division,  $\Delta t = 8$ ,  $Y_{t_1}$  represents the per capita income at year 2016,  $Y_{t_0}$  is the per capita income at year 2008,  $SNAI$  is the six-level factor classifying Italian municipalities into categories, as shown in Figure 1b, and  $NUTS1$  is another factor identifying Italian macro-regions: North-West (NW), North-East (NE), Centre (CE), and South (SO). The introduction of the two factors allows to highlight potential differences in mean values of log-variations of the dependent variable. The variables usually employed in conditional models (Barro 2015) are not available in our case at LAU2 level.

Following Rey and Montouri (1999), we then investigated the possible presence of spatial autocorrelation in the residuals. Spatial contiguity has been introduced by means of the row-normalized matrix  $W = [w_{ij}]$ , with  $w_{ij} > 0$  if and only if two municipalities  $i$  and  $j$  are considered to be spatially connected, and  $w_{ij} = 0$  otherwise. Different connectivity matrices have been considered (Anselin and Bera 1998; Getis 2010), all of which are based on a clear exogeneity of the measures: (a) first-order contiguity ( $w_{ij} > 0$  if municipalities  $i$  and  $j$  share a part of common border), (b)  $k$ -nearest neighbours, i.e., each municipality has exactly  $k$  neighbours, which are the  $k$  nearest ones (in our case, we took  $k = 6, 8$ , and  $12$ ), and (c) the inverse distance function  $f(d_{ij}) = w_{ij}^* = 1/d_{ij}^2$  with  $w_{ij} = w_{ij}^* / \sum_j w_{ij}^*$ , for  $d_{ij} < \bar{d}$ , with the threshold distance  $\bar{d}$  fixed to  $\max_i \left( \min_j d_{ij}, \forall i \right) = 17$  km, that is the maximum among the minimal distances evaluated for each of the 7129 municipalities. After applying all the possible contiguity matrices, we found confirmation to the robustness of the spatial specification to different criteria—for this reason, only the results regarding the  $W$  matrix based on inverse distances will be presented in Section 3.

Spatial autocorrelation has been assessed through Moran’s index,  $I$  (Moran 1950). On the basis of the significant results, we then proceeded to the choice of the best spatial autoregressive model to explain the convergence process.

RQ2. As a most relevant step for our study, we have focused our attention to IA municipalities. The chosen model was a random effects panel regression model (Wooldridge 2010), relating per capita incomes with the public expenditure categories. In particular, we have considered the following expenditure components, comprising both productive and non-productive categories: (1) education (EDU); (2) cultural heritage (HER); (3) youth, sports, and leisure (YSL); (4) tourism (TOU); (5) environment protection and planning (ENV); (6) social policies (SOC); (7) economic development (ECO); and (8) agriculture (AGR). Three dummy variables have also been added in matrix  $D$ , for the territorial partitions (with the reference macro-region being NW), giving:

$$y = X\beta + D\gamma + \varepsilon \tag{2}$$

where:  $y = (y_{11} y_{12} \dots y_{1T} y_{21} \dots y_{2T} \dots y_{m1} \dots y_{mT})'$ ;  $X = [x_1 x_2 \dots x_k]$  is the independent variables matrix, with  $x_h, h = 1, \dots, k$  having the same structure as  $y$ ;  $D = [d_1 d_2 \dots d_m]$  is the dummy variables matrix, with  $d_l, l = 1, \dots, m$  having the same structure as  $y$ ;  $\beta$  and  $\gamma$  are parameter vectors of dimension, respectively,  $(k \times 1)$  and  $(m \times 1)$ ; and the  $(nT \times 1)$  error vector  $\varepsilon$  is modelled as  $\varepsilon_{it} = \alpha_i + u_{it}$ , with  $\alpha_i$  being the random individual component (constant across time periods) and  $u_{it}$  is the residual noise term. All the quantitative variables included in the model have been log-transformed (adding 1 to allow for the transformation in the case of null expenses).

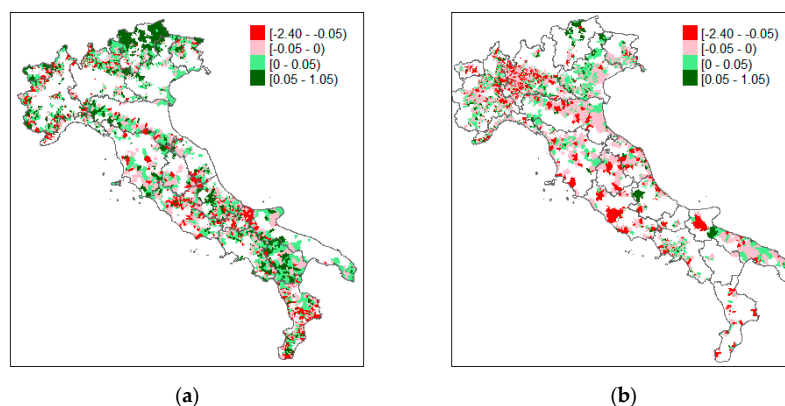
### 3. Results and Discussion

The following Table 1 presents univariate statistics regarding per capita incomes.

**Table 1.** Univariate statistics for the per capita incomes in 2008 and 2016.

Year	SNAI	Min	Q <sub>1</sub>	Q <sub>2</sub>	Mean	Q <sub>3</sub>	Max	SD	CV
2008	Inner areas	2367	8441	10,773	10,628	12,518	21,870	2610	25
	Centers	4699	11,590	13,401	13,068	14,866	29,472	2893	22
2016	Inner areas	2402	8428	10,763	10,729	12,665	32,315	2787	26
	Centers	1238	11,472	13,298	12,918	14,619	28,508	2823	22

The mean and median (Q<sub>2</sub>) per capita incomes are lower in inner areas with respect to the centers. It is important to stress the fact that in the period considered, inner areas have recorded a 0.95% increase in mean per capita incomes, while centers have experimented a decrease in real incomes (−0.77%). Figure 2a,b shows the logarithms of the ratio between per capita incomes in 2016 and 2008 for inner areas and centers, respectively.



**Figure 2.** Values of  $\ln(Y_{2016}/Y_{2008})$  in Italian municipalities: (a) inner areas; (b) centers.



In particular, 1840 inner area municipalities show an increasing income (53.36% of the total), while only 1378 centers achieve the same result (37.44%). This suggests a convergence process between inner areas and centers with respect to per capita incomes.

The results for the conditional  $\beta$ -convergence model (1) are presented in Table 2. All the variables are highly significant, with the exception of the dummy relating to inter-municipal poles. The  $\beta$  coefficient presents a negative sign, highlighting a positive annual rate of convergence regarding the per capita income levels. Regarding SNAI classification, the convergence is faster moving from poles to remote areas (ultra-peripheral municipalities). As to *NUTS1*, only NE has positive sign, implying a differentiated convergence process among macro-regions, which is faster in Northern than in Central and Southern Italy.

**Table 2.** Parametric estimation results for model (1).

	Estimate	Std. Error	t Value	Pr(> t )
Intercept	0.0602	0.0066	9.12	<0.001
SNAI-Inter-municipal poles	0.0009	0.0011	0.82	0.4113
SNAI-Urban belts	0.0018	0.0007	2.63	0.0085
SNAI-Intermediate	0.0030	0.0007	4.22	<0.001
SNAI-Peripheral	0.0032	0.0007	4.37	<0.001
SNAI-Ultra-peripheral	0.0052	0.0010	5.47	<0.001
Rip-NE	0.0035	0.0003	11.70	<0.001
Rip-CE	−0.0021	0.0004	−5.86	<0.001
Rip-SO	−0.0024	0.0004	−5.64	<0.001
ln $Y_{2008}$	−0.0067	0.0007	−9.89	<0.001
Adj. R-squared	0.0535			
Moran test on residuals	0.1177			<0.001

We conclude this first part of the analysis by noting that there seems to be a confirmation of neoclassic theory (Solow 1956), according to which less developed areas, inside a single country economy, tend to grow faster than more advanced ones. At an EU countries level, on the other hand, the same process is put into question (Haynes and Haynes 2016). Indeed, literature shows how economies with different degrees of development converge only in the presence of not too dissimilar structural conditions—for example, technological level or propensity to save (Barro and Sala-i-Martin 1991; Higgins et al. 2006).

The presence of significant spatial autocorrelation in the residuals, measured through Moran's  $I$  calculated on the inverse distances connectivity matrix, suggests the inclusion of a spatial parameter into the classic convergence model (1). Various models have been fitted to the data: spatial auto-regressive (SAR), spatial error model (SEM), spatial auto-correlation (SAC), spatial Durbin model (SDM), spatial auto-regressive moving-average (SARMA). Akaike's information criterion has led to the choice of SEM, which assumes the following formulation:

$$\begin{aligned} \frac{1}{\Delta t} \ln(Y_{t_1} \oslash Y_{t_0}) &= SNAI + NUTS1 + \beta \ln Y_{t_0} + \nu \\ \nu &= (I - \lambda W)^{-1} \varepsilon \text{ and } \varepsilon \sim N(\mathbf{0}, I_{7129}) \end{aligned} \quad (3)$$

Parametric estimation is reported in the following Table 3. The resulting model is satisfactory from a purely statistical point of view—the (pseudo) R-squared has increased remarkably, the errors show no more spatial autocorrelation, as indicated by Moran's  $I$  test, there is no correlation ( $r = 0.0131$ ) between the residuals and the independent variable  $\ln Y_{t_0}$  and, at last, the Breusch–Pagan test clearly states the absence of heteroskedasticity. From the point of view of the interpretation of the results, we have to remember at first that SEM are the only spatial econometric models for which the classical interpretation of the parameters of linear models is retained (LeSage and Pace 2013). The error autoregressive parameter  $\lambda (=0.5673)$  accounts for autocorrelation in measurement errors, which is most important and very coherent in our framework, or for autocorrelation in the unmeasured variables in the

model. In other words, it highlights global spatial diffusion effects deriving from an exogenous shock on a variable not included in the model:  $\Delta \nu = (I - \lambda W)^{-1} \Delta \varepsilon = I \Delta \varepsilon + \lambda W \Delta \varepsilon + \lambda^2 W^2 \Delta \varepsilon + \lambda^3 W^3 \Delta \varepsilon + \dots$ . The most relevant consideration pertains once again to the parameter  $\beta$ , which is negative and stronger than in Model (1), confirming the convergence process. Furthermore, the increase in per capita incomes is higher in IAs and in Northern Italy regions.

**Table 3.** Parametric estimation results for model (3).

	Estimate	Std. Error	z Value	Pr(> z )
Intercept	0.0939	0.0075	12.5151	<0.001
SNAI-Inter-municipal poles	0.0006	0.0011	0.6047	0.545
SNAI-Urban belts	0.0012	0.0006	1.9183	0.055
SNAI-Intermediate	0.0019	0.0007	2.8361	0.005
SNAI-Peripheral	0.0018	0.0007	2.3509	0.019
SNAI-Ultra-peripheral	0.0035	0.0011	3.2498	0.001
Rip-NE	0.0028	0.0006	4.6745	<0.001
Rip-CE	−0.0032	0.0007	−4.5733	<0.001
Rip-SO	−0.0038	0.0007	−5.5691	<0.001
$\beta$	−0.0102	0.0008	−13.1686	<0.001
$\lambda$	0.5673	0.0231	24.5990	<0.001
Nagelkerke's pseudo R-squared	0.1202			
Moran test on residuals	−0.0195			>0.999
Breusch–Pagan test for heteroskedasticity	6.1549			0.7243

Since our interest, as stated in RQ2, is to understand the impacts of local public policies on incomes, we now turn to the results of the implementation of panel Model (2). Some important variables may be excluded from the study, but, as for the case of convergence analysis, data at municipality level are lacking (e.g., employment rates by economic sector, consistency and structure of firms, and so on).

In order to show the dimensions of inner areas' local administrations' expenditure, we calculated the percentiles reported in Table 4.

**Table 4.** Univariate statistics for the per capita public expenditures in Italian inner areas (2008 and 2016 deflated values).

Expenditures	2008					2016				
	P <sub>0</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>100</sub>	P <sub>0</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>100</sub>
EDU	0.00	51.46	83.25	126.29	2580.36	0.00	43.59	74.25	119.42	1707.81
HER	0.00	3.05	13.74	37.79	5138.22	0.00	1.21	8.21	24.52	7553.18
YSL	0.00	5.00	16.07	41.09	3385.71	0.00	1.60	7.36	21.76	5349.03
TOU	0.00	0.00	3.80	18.63	6437.69	0.00	0.00	2.20	13.64	11,166.45
ENV	0.00	114.09	173.34	275.57	5046.95	0.00	120.34	174.87	273.87	8174.08
SOC	0.00	36.47	63.11	110.62	2156.48	0.00	28.19	51.10	88.91	2731.01
ECO	0.00	0.00	0.90	10.01	4198.99	0.00	0.00	0.02	3.84	4893.18
AGR	0.00	0.00	0.00	0.29	1528.11	0.00	0.00	0.00	0.00	1889.24
<b>Tot</b>	<b>0.00</b>	<b>333.29</b>	<b>461.52</b>	<b>690.13</b>	<b>8238.16</b>	<b>0.00</b>	<b>291.17</b>	<b>401.41</b>	<b>602.29</b>	<b>13,332.43</b>

The median total expenditure in 2008 was about €460. The upper 25% of municipalities spent at least €690 per capita. In 2016, the median total expenditure had reduced to €400, and, in the same way, the third quartile had lowered to about €600. The highest expenditures relate to environment protection and planning, followed by education and social protection. On the other side, the lowest expenditures are those for agriculture and economic development.

The main results for the panel regression model are highlighted in Table 5; some other diagnostics—including generalized variance-inflation factors for the presence of multicollinearity,

the Breusch–Pagan test for the choice of a random effects model, and the standardized residuals distribution—are reported in Appendix A.

**Table 5.** Parametric estimation results for Model (2).

Effects:	Var	Std. Dev	Share	
idiosyncratic	0.0031	0.0559	0.12	
individual	0.0229	0.1515	0.88	
theta:	0.7462			
Coefficients:	Estimate	Std. Error	z-Value	Pr(> z )
Intercept	9.3632	0.0084	1110.1907	<0.001
NE	0.0826	0.0083	10.0090	<0.001
CE	−0.1347	0.0084	−16.1113	<0.001
SO	−0.4008	0.0067	−59.7170	<0.001
EDU	0.0037	0.0013	2.9168	0.0035
HER	0.0024	0.0008	2.8485	0.0044
YSL	0.0018	0.0008	2.3139	0.0207
TOU	0.0070	0.0008	8.8272	<0.001
ENV	−0.0035	0.0013	−2.7307	0.0063
SOC	0.0014	0.0012	1.2381	0.2157
DEV	0.0013	0.0008	1.7182	0.0858
AGR	−0.0016	0.0013	−1.3015	0.1931
R-Squared:	0.8010		Adj. R-Squared:	0.8007

Adjusted R-squared accounts for about 80% of the observed variability; and only two variables are not significant, that is, social policies (SOC) and agriculture enhancement (AGR) expenditure.

The functions of municipalities relating to agriculture are very restricted, and, as a consequence, they allocate scarce financial resources to this economic sector—this might explain the absence of significant effects of this expenditure on per capita income levels. Actually, the transfer of administrative functions in this field from regions to municipalities is rather limited (Tubertini 2016). In any case, the multifunctional agriculture model plays a very important role in local development (CREA 2018). Municipalities can promote bottom-up planning paths—these projects must include goals relating to sustainable development, social inclusion, and protection and enhancement of natural resources and landscapes (Basile and Cavallo 2020).

Social policy expenditures represent a major signal of the attention paid to internal cohesion (IFEL 2018). In any case, they do not seem to influence income levels, because of the increasing situations of suffering and distress deriving from economic and social crisis in inner areas. Families, older people, minors, and people with disabilities are the main beneficiaries of social expenses. They are people without income for tax purposes, and this might explain—at least in part—the lack of positive effects on the part of these policies. The offer of services needed for improving population well-being should have a key role in the present economic, social, and demographic context (IFEL 2016).

Environmental expenditure (ENV) is the only variable to take a negative parametric value. It is used to combat environmental emergency afflicting inner areas, such as hydrogeological instability and natural and landscape resource deterioration, as well as waste and water resources management (Mastronardi et al. 2016). They are not aimed at large investment projects, for example, circular economy or green economy projects, which could promote the development of these lands.

Among the remaining expenditure categories, all positive and significant, the most important role is played by tourism (TOU), followed by education (EDU). Italian inner areas are, in fact, rich in cultural and natural resources (Forleo et al. 2017). Tourism may constitute an engine for economic growth (MIBACT 2017). Tourism expenditures are aimed at the valorization of amenity resources, which represent the main reason to visit inner areas (Mastronardi et al. 2017). They promote youth



employment, the recovery of dwellings, and the creation of income opportunities for local residents (Becheri et al. 2018), and they facilitate the discovery by the general public of remote regions which were formerly excluded from big tourism circuits (Pazzagli 2017).

Education expenditures primarily comprise the maintenance and management of public school buildings (heating, electricity, water, and so on). Municipalities possibly also invest in training activities, which are needed for the entry into employment of the students. Education improvement is the pivotal point for the school system to take on an important role in terms of social and economic development (Ciarini and Giancola 2016).

The territorial effect has been captured by means of the dummy variables relating to macro-regions—in this regard, it is possible to see how North-Eastern inner area municipalities have experienced a much higher per capita income growth with respect to North-Western inner area municipalities, while Central and Southern inner area municipalities have had negative growth when compared with North-Western ones. This is a further confirmation of the gap that still exists between Southern and Northern inner areas.

#### 4. Conclusions

Italian inner areas are identified by means of indicators measuring the distance of the territories from schools, hospitals, and train stations in terms of travel times. These areas are geographical zones less served by public services. They have been characterized by strong depopulation and ageing. Inner areas' policies are based on a national cohesion policy that has obtained rather scarce results, in terms both of social and economic growth, and of appropriate governance.

The weakening of inner areas stems, in fact, primarily from inappropriate policies, such as institutional reforms not based upon territories, public investments focused on urban areas, and public subsidies granted in the form of indiscriminate all-round distributions, only to reduce social tensions (Barca 2018). As a consequence, inner area municipalities have lower per capita income levels than centers. However, a process of convergence relative to territorial features has emerged from the analysis—the gap shows a reduction between 2008 and 2016. Spatial differences are important, with inner areas having better performance than centers. This process is not homogeneous in space (inner areas and North-Eastern municipalities are experiencing a faster convergence rate). Regarding the municipalities' policies, not all of the local administrations' expenditures have had a positive effect. A change is needed in the distribution of expenditure among categories, in order to achieve a bigger impact on per capita incomes (e.g., higher expenditure for tourism and education could improve income level).

SNAI has introduced novelty elements that can facilitate inner area development and, consequently, promote an increase in income levels, but translating them into decision-making processes needs a significant planning effort and the creation of relationships with institutional networks. The beneficiaries of SNAI are generally small communities with weak planning potential, and therefore they need support in the building of their own bottom-up growth strategy.

Inner area development requires an increased investment in human resources through the reinforcement of local public administration and local communities. National laws must take into account the specific requirements of inner areas. Similarly, EU policies should not limit themselves to enunciating high principles, but also ensure the flexibility required to meet the real needs of these territories.

Another factor that could promote inner area development could be that of implementing forms of cooperation among mayors, to carry out effective and efficient public policies. In this context, the diffusion of forms of association among municipalities (Unions of Municipalities) could improve the quality of public expenditure, with positive effects on per capita income levels. The optimization of the management of the missions, as well as easier access to services on the part of citizens, are the primary objectives of Municipality Unions.

Finally, the spending review process can negatively affect municipalities' investment opportunities and, as a consequence, the per capita income growth in inner areas. In order to avoid this scenario, it is necessary to preserve at least the current public expenditure level, to keep the cohesion policy unchanged for all of the Italian regions, and to give priority to social inclusion.

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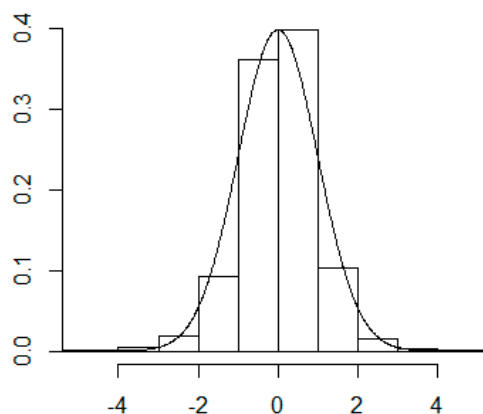
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## Appendix A

**Table A1.** Generalized variance-inflation factors (GVIFs) for Model (2).

Variable	GVIF	Df	GVIF <sup>1/(2·Df)</sup>
Macro-regions	1.052	3	1.008
EDU	1.219	1	1.104
HER	1.105	1	1.051
YSL	1.121	1	1.059
TOU	1.074	1	1.036
ENV	1.185	1	1.089
SOC	1.152	1	1.073
DEV	1.145	1	1.070
AGR	1.153	1	1.074

Breusch–Pagan Lagrange multiplier test for random effects:  $\chi^2_1 = 2426.7; p < 0.001$ .



**Figure A1.** Residuals histogram for Model (2) versus standard normal curve.

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