

IL CONTRIBUTO DELLE PICCOLE E MEDIE CITTÀ ALLA CRESCITA REGIONALE
IN ITALIA. PRIME EVIDENZE PER IL PERIODO 2001-2011

David Buralassi¹, Sabrina Iommi²

SOMMARIO

Small and medium-sized cities host the largest share of Italian population and jobs. Moreover, they have represented the engines of economic growth in many Italian regions. This holds especially for those regions characterized by the presence of industrial districts and clusters, which have steeply shaped their economic structure and development patterns. Those include the regions of Central Italy, which show the highest presence of small and medium cities.

Our work aims to explore the contribution made by small and medium-sized urban systems to the economic development of Italian regions in the last decade. We analyze what are the determinants of economic trajectories in urban regions and whether different kinds of agglomeration externalities, such as mechanisms of functional specialization, may have been a role for urban and regional growth by acting as substitutes for the lack of metropolitan scale. After having discussed the issue of the spatial definition of city, we provide an economic taxonomy of Italian urban systems according to their specialization in terms of economic functions available at the urban level. This allows for a synthetic urban ranking index describing the role of the city into the regional hierarchy. The following step is the analysis of the economic performance of different typologies of cities, by identifying the dimensions that have driven regional growth in terms of population, jobs and economic competitiveness. The results of the analysis provide some remarks about the challenges and the potential of small and medium-cities for regional and national economic development.

¹ IRPET, Istituto Regionale di Programmazione Economica della Toscana, via P. Dazzi 1, 50141, Firenze, e-mail: david.buralassi@irpet.it.

² IRPET, Istituto Regionale di Programmazione Economica della Toscana, via P. Dazzi 1, 50141, Firenze, e-mail: sabrina.iommi@irpet.it..

1. Introduction

Small and medium sized cities represent an important feature of the Italian economic and social landscape. Nowadays around the 47% of Italian population (27.8 million inhabitants) lives in areas between 50 000 and 500 000 inhabitants, while 39% of population is settled in large and metropolitan urban areas.

The presence and development of Italian small and medium sized cities derives from several reasons. Historical reasons (e.g. the presence of several and independent States till mid 19th century) determined a polycentric development of cities settled relatively close to each other, which influenced – by means of path dependency – urban growth in the last decades. Geographical and orographic factors also influenced urban development in small and medium cities, since urban expansion has been bounded by physical limits.

Small and medium sized urban environments often hosted development patterns characterized by the presence of clusters of (small and medium) enterprises, such as the industrial districts. This especially holds for the regions of Central and North-Eastern Italy, which lack large metropolitan areas. Instead, they show both the presence of medium urban systems and industrial cluster, which often overlay. In those systems several mechanisms of agglomeration externalities, other than size, had been a role for urban and regional economic growth, such as economic and functional specialization and polycentric development. The development of industrial clusters leaded economic take-off in the period 1950-1980, while it slowed in 1980-2000, where conversely, (large) cities became the drivers of growth. Hence, it is worth focusing on the last decade, which has been characterized by structural change in economic basis of regions and, in the last years, it has been affected by economic crisis.

Aiming to investigate the role of small and medium cities in economic development, we argued that “size” of cities have to be defined not only by using a demographic approach (in terms of population, firms, ...) but also considering the amount and quality of “urban” services provided by cities, which in turns determine the relative position of cities within the urban hierarchy. Hence, we first discussed the issue of the spatial economic identification of cities. By adopting a functional approach to the delimitation of cities, we considered Functional Urban Areas (FUA) as units of analysis. We incorporated also a morphological criterion, by merging neighbouring functional areas that share the same urban morphological zone (UMZ). Then, we provided an economic taxonomy of Italian FUAs in terms of economic functions that they provide. We proposed and applied a synthetic urban ranking index. This is a multidimensional index that synthesises the factors affecting the role of a city: presence of advanced services, economic level and dynamics, sectoral variety, agglomeration economies. This taxonomy showed how hierarchy can be disentangled from demographic scale: there are some large urban areas which seem to lack some of the factors that are

nowadays determinant to exploit agglomeration economies within urban environments, such as the provision of hi-tech and high-knowledge services; this turns in a low rank in the national hierarchy. Conversely, some medium and even small urban areas show a relatively high rank.

The subsequent step of the analysis was the assessment of development patterns in the period 2001-2011 by different typologies of cities. We considered both demographic typologies and Urban rank typologies. In the last decade urban growth has been linked to urban size: large and metropolitan urban areas has shown higher dynamics, in terms of employment creation, than smaller settlements. However, Italian cities show a high degree of heterogeneity, both at dimensional and territorial level, that affected their dynamics. In some cases small and medium cities outperformed largest urban areas: despite the relative small size, the former are often characterised by high rank within national urban hierarchy. This holds especially in regions belonging to Central and North-Eastern Italy.

The results of the analysis allowed us to give some remarks about the challenges and the potential of small and medium-cities for regional and national economic development, which have been presented in the conclusion of the article.

2. A taxonomy of Italian cities based on the provision of (urban) services

The first step for an analysis aimed at studying the effects of urban size and functions on economic development is represented by the identification of the unit of analysis, i.e. the definition of city to be applied. As is well known, industrial development, and the related experiences of urbanization first and of suburbanization later on, made the notion of a city's administrative boundaries outdated. In fact, these had been usually traced at a time when the compactness of settlements, the density of population and the concentration of economic activities fitted together, and were immediately visible as opposed to the rural areas characterized by a low-intensity settlement. The modern city has instead a somewhat diluted shape, which poses problems of identification.

The procedure suggested in the present work is meant to circumscribe a *city's boundaries* starting from a conceptual clarification of the unavoidable “ingredients” of an urban pole: *demographic dimension, economic dimension, quality and variety of functions* performed and a certain degree of *settlement compactness*. Consequently, the factual data on settlement modalities are not entirely neglected, but – as it will be shown afterwards – they are employed at a later stage for comparison with other parameters. Our method has many points in common with those of several recent studies of urban structure. We can mention, first of all, the analyses carried out in the framework of the European project ESPON (cf. Nordregio,

2004), then the later contributions inspired by them, and finally, for the Italian context, the surveys of ISTAT (2006), Bank of Italy (Di Giacinto *et al.*, 2012) and of university research teams (Calafati, 2012). The methodological innovation is to identify first the cities and afterwards the urban hierarchy, through the application of consecutive filters to a set of common data taken as a basis, that is the map of Local Labour Systems (LLSs)³.

The application of a demographic threshold introduces a first distinction between urban and non-urban systems, where the former are by definition characterized by a stronger concentration of population. For the sake of methodological homogeneity, we choose to apply the threshold already used by ESPON contributions at European level for the identification of *Functional Urban Areas* (FUAs): these are local systems with a total population of no less than 50,000 inhabitants and a main centre of at least 15,000 inhabitants. This threshold is clearly very low, so that it leaves the ground for the application of the following filters.

One aspect to be taken into account in the identification of the urban areas relates to the possibility that some FUAs can be highly linked to each other and hence should be considered as a unique urban area. The criterion we chose to check for this possibility is given by *settlement modalities*. We referred to an indicator available at European level, the *Urban Morphological Zone* (UMZ), which is constituted by urbanized areas distant no more than 200 metres, and was developed starting from the survey *Corine Land Cover* 2006. We thus combined FUAs interconnected by a compact built fabric, in the assumption that, even if it is true that the contemporary city no longer corresponds to a compactly built area but can be better approximated as the territory in which socioeconomic relationships are more dense (which is the reason why we initially decided to adopt a functional definition), it is also true that these relationships are present and significant where they take the form of a morphological category. The presence of UMZs cross-cutting the boundaries of FUAs can however be observed, as regards Italy, only in a few cases, which are provided by table 1.

³ The definition adopted is functional to the national territory, where it identifies the nowadays local communities (be them districts, cities, metropolitan areas) starting from commuters' daily travels correlated to the organization of labour markets. The basic idea, on which are grounded the studies leading to the definition of a LLS (ISTAT-IRPET, 1986), is that daily movements take place where economic and social relationships are more dense, in a space that corresponds to the community to which people belong. Although the calculation method used by ISTAT to identify daily commuting basins is not exempt from critics, and can certainly be refined (cf. Compagnucci, 2009), the idea that a good approximation for a territorial collectivity is given by the places of daily attendance is certainly a sound concept.

Table 1
EXTENDED URBAN AREAS FORMED BY MORE THAN ONE FUA

	Region	Number of FUAs	Population
Milan metropolitan area	Lombardia	6	5.2 millions
Bergamo	Lombardia	2	875 000
Brescia	Lombardia	2	530 000
Thiene-Schio	Veneto	2	200 000
Rimini	Emilia-Romagna	2	300 000
Firenze-Prato	Toscana	2	985 000
La Spezia - Versilia	Toscana & Liguria	5	525 000
Naples metropolitan area	Campania	7	3 millions
Palermo	Sicilia	2	950 000
Catania	Sicilia	2	700 000

Once the units of analysis have been delimited, the second step of the analysis is to *identify the urban functions*, a criterion that will be employed later on to select further the territorial areas. Even if the identification of urban functions is not a new issue from a conceptual viewpoint (see, e.g., Stewart Jr, 1958), a well-established method for identifying and selecting urban functions does not really exist at present. In general, the starting point for the identification of urban functions is the commonly shared and empirically founded idea that cities, because of their demographic and economic dimensions, can put into effects some unique and highly-specialized functions, which cannot be found everywhere, but only in a few poles benefitting from very peculiar contextual conditions (i.e., urbanization economies). Territorial uniqueness is applied to the employees of the different economic sectors,⁴ and gives us a distinction between urban and non-urban functions and assigns them a different degree of urbanity. Among the urban functions selected we find a number of *high- and medium-tech manufacturing activities*, as well as *highly-specialized tertiary activities* associated with logistics, financial intermediation, academic education and research, hospital and business support services. The activities associated to *academic education*, *telecommunication* and *publishing* seem particularly rare even in the urban environment (Table 2).

⁴ The figure on employees was drawn from the ISTAT archive ASIA of business local units, 2009. Given that the public tertiary sector, especially with a high level of qualification, plays a key role in the cities, we decided to complement this archive with the data concerning the employees of universities (Source: Ministry of Education, Universities and Research) and hospitals (Source: Ministry of Health).

Table 2
CLASSIFICATION OF URBAN FUNCTIONS. 2009

	Specialization index FUA/non-FUA (a)	Concentration index normalized for urban FUAs (b)	Overall degree of urbanity (geometric average of a*b)
HT and ICT manufacturing			
CF Chemical-pharmaceutical industry	2.54	1.42	1.90
CI Computers, electronics, optics	1.91	1.23	1.53
MHT manufacturing			
CD Oil products	2.11	1.33	1.68
CE Chemical products	1.70	1.15	1.40
CK Mechanical engineering	1.14	1.10	1.12
CL Means of transport	1.29	1.16	1.22
Logistics			
H Transportation and storage	1.39	1.01	1.18
Financial services			
K Financial and insurance activities	1.72	1.03	1.33
Publishing and telecommunications			
JA Publishing	5.18	1.31	2.61
JB Telecommunications	8.05	1.33	3.27
KIBS and universities			
JC Information services	2.45	1.16	1.68
MA Professional activities	1.32	0.97	1.13
MB Research & Development	2.62	1.23	1.80
MC Other professional activities	1.58	1.04	1.29
University staff (Ministry of Education, Universities and Research)	11.10	1.37	3.90
Personal care services			
L Real estate activities	1.11	0.89	0.99
R Arts and entertainment activities	1.05	0.98	1.01
E Public utilities (water, urban sanitation)	1.71	0.98	1.30
Hospital staff (Ministry of Health)	1.34	1.03	1.17
Other specialized services to firms			
N Administration and support activities	2.27	1.07	1.56

Source: IRPET elaboration on data from ISTAT, Ministry of Education, Universities and Research and Ministry of Health

Once the urban functions have been identified, consistently with the wide literature on the Jacobsian approach (Jacobs, 1969), we introduced an additional component in the concept of city, the *variety* of the urban functions offered by cities. FUAs are accordingly classified and arranged as to their *degree of urban specialization*, as well as to the *number of urban functions* in which they gain a specialization, the *quality* of these urban functions (degree of uniqueness), and the *homogeneity* of their specialization level. Two straightforward indicators of economic performance (employees per inhabitants, and added value per inhabitants), have finally been included in order to obtain a classification of urban poles which simultaneously takes into account the functions performed and the results obtained.

Then, summarizing all the relevant aspects discussed above (urban functions, urban economic specialization/variety, economic performance), we obtained a hierarchical classification of the urban poles across Italy. For each FUA, a synthetic index of the position in the hierarchy, or Urban Rank Index, has been computed by summarizing the first factor of a principal component analysis, whose aim is in fact that of inferring a latent variable (urban ranking) from a multiplicity of observed variables. The explained variance, the correlations between the initial variables and the first component, as well as the contribution of each variable to the final result are illustrated in table 3. The extracted factor, assumed as the index of urban ranking, explains a 52% of the overall variance and derives from basically equal contributions

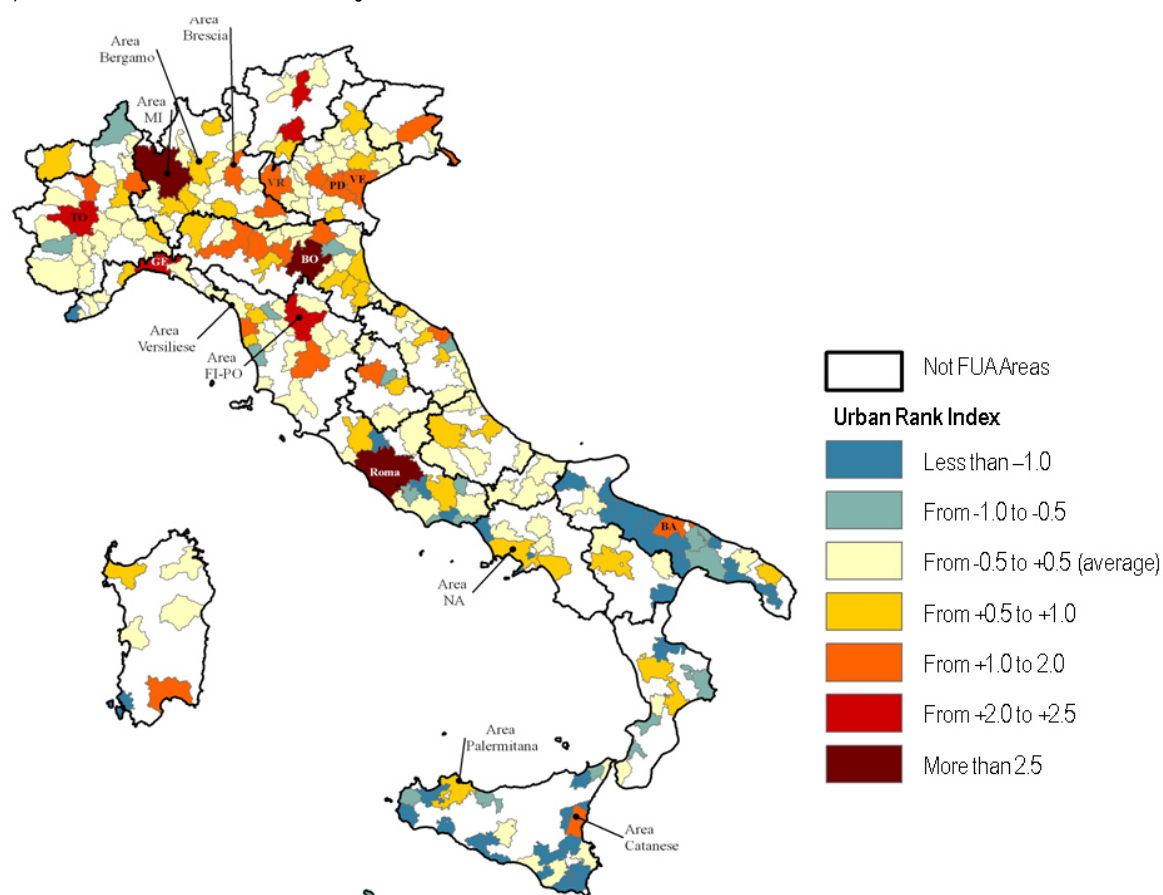
of the initial variables. Figure 1 shows the map of Italian FUAs according to their Urban Rank Index.

Table 3
Results of the principal component analysis

Components	Eigen values	% variance	Cumulated %	Variables	Coefficients of Correlation with the first component	Factorial weights for the first component
1	3.098	51.6	51.6	Abs value per inhabitant	0.821	0.265
2	1.250	20.8	72.5	No. of urban specializations	0.782	0.252
3	0.975	16.3	88.7	Total urban specializations	0.774	0.250
4	0.393	6.6	95.3	Employees per inhabitant	0.710	0.229
5	0.208	3.5	98.7	Urban functions	0.676	0.218
6	0.076	1.3	100.0	1/CV urban specializations	0.505	0.163

Source: IRPET elaboration on data from ISTAT, Ministry of Health and Ministry of Education, Universities and Research

Figure 1
Map of Italian Functional Urban Areas according to their Urban Rank Index



As expected, Italian FUAs show a high degree of spatial heterogeneity in their urban rank index. This is of course related to the distribution of population and economic activity across Italy. Northern areas are generally characterized by higher level of urban functions, economic

performance and variety of economic structure, hence they show higher Urban Rank Index (Table 4).

Table 4

Average values of population, Urban Rank index and Economic level of FUAs within macroregions

	Population	Urban Rank Index	Economic level
North	224,799	0.44	0.70
Centre	201,375	0.15	0.22
South	184,090	-0.64	-0.93

Obviously urban rank index and size of the FUAs in terms of population are highly linked to each other. However, there are some FUAs, among small and medium sized cities, which show values of Urban Rank Index relatively high. Table 5 shows the main urban areas in Italy, which have been clustered in four groups according to their dimension. We considered small and medium cities those FUAs comprised respectively between 100,000 and 250,000 inhabitants and 250,000 and 500,000 inhabitants. The table summarizes the presence of urban functions as identified in the first step of the analysis, the economic performance, the specialization index of production functions and the specialization index of cultural function and the Urban Rank Index. Focusing on the clusters of medium and small cities, we can see how some of them show levels of Urban Rank Index relatively high. This is the case of many cities in Emilia-Romagna Region (in Northern Italy), such as Parma, Modena, Reggio Emilia, Ferrara. Other medium sized FUAs, such as Vicenza and Udine and small FUAs, such as Pisa, Siena, Ancona, show the same levels of Urban Rank Index which is possible to find in large cities and even in Metropolitan systems. Conversely, there are FUAs within the two higher clusters (metropolitan systems and large cities) that show low levels in their Urban Rank Index. Those FUAs are generally characterized by high demographic dimension and high share of public services, while they lack of presence of urban functions, especially those provided by private sector and involving high-skill positions.

Table 5
THE URBAN HIERARCHY IN ITALY

City typology	Population size class	City – LLS or total of LLSs (descending order of population)	Presence of urban functions (high > 3° quartile, low < 1° quartile)	Economic performance (high > 3° quartile, low < 1° quartile)	Specialization index of production functions	Specialization index of cultural functions	Urban Rank Index (urban if ≥0,5)
Metropolitan systems	> 1,000,000	Milan area*	High	High	1.2	1.3	2.95
		Rome	High	High	1.0	1.7	2.78
		Turin	High	High	1.4	1.3	2.37
		Naples area*	High	Low	0.9	1.0	0.78
Large cities	500,000-1,000,000	Bologna	High	High	1.3	1.2	3.34
		Genoa	High	High	0.9	1.3	2.41
		Florence-Prato *	High	High	0.8	1.0	2.10
		Padua	High	High	1.0	1.2	1.86
		Venice	High	High	0.9	0.8	1.51
		Verona	High	High	0.8	0.9	1.46
		Bari	High	Medium	1.2	1.2	1.41
		Brescia *	Medium	High	1.2	0.9	1.39
		Catania *	High	Medium	1.0	1.0	1.01
		Bergamo *	Medium	High	1.2	0.7	0.97
		Palermo- *	High	Medium	0.8	1.2	0.61
Medium cities	250,000-500,000	Parma	High	High	1.3	1.0	1.74
		Modena	High	High	1.4	0.8	1.40
		Reggio Emilia	High	High	1.5	0.8	1.36
		Vicenza	High	High	1.2	0.8	1.26
		Udine	High	High	1.1	1.0	1.22
		Cagliari	High	Medium	1.0	1.2	1.13
		Pescara	Medium	Medium	1.0	1.0	0.81
		Lecce	High	Medium	0.8	1.3	0.69
		Treviso	Medium	High	0.8	0.8	0.64
		Salerno	High	Medium	0.7	1.1	0.55
Small cities**	100,000-250,000	Frosinone	Medium	Medium	1.1	0.6	0.55
		Pisa	High	High	0.9	1.9	1.91
		Siena	High	High	0.8	1.5	1.86
		Ancona	High	Medium	1.0	1.1	1.64
		Ferrara	High	High	1.0	1.1	1.33
		Livorno	High	Medium	1.1	0.7	0.96
		Pesaro	Medium	High	1.1	1.0	0.90
		Piacenza	High	High	1.2	0.8	0.85
		Forli	Medium	High	1.0	0.7	0.64
		Ravenna	Medium	High	0.8	0.7	0.72
		Sassuolo	Medium	High	1.3	0.4	0.66
		Lucca	Medium	High	0.7	0.8	0.63
		Cesena	Medium	High	0.8	0.7	0.56

* These areas combine two or more urban LLSs, united in a same UMZ. In details, the Milan area is the sum of the LLS of Milan, Busto Arsizio, Como, Seregno, Sesto Calende and Varese, while the Naples are comprise the LLSs of Naples, Aversa, Castellammare di Stabia, Cava de' Tirreni, Nocera Inferiore, Nola and Torre del Greco.

** The cases scored are only those of the four regions under analysis. There are still 19 cases in the remaining regions; only 11 cases among the class of population under 100,000 inhabitants have a urban ranking, five of which are in polycentric regions.

Shaded entries show the polycentric regions.

Source: IRPET elaboration on data from ISTAT, Ministry of Education, Universities and Research e Ministry of Health

3. Dynamics of Italian cities: the role of Small and Medium sized cities

Once having identified a taxonomy of Italian cities according to the index of urban hierarchy, we analyzed their development in the last decades, both taking into account urban size and hierarchy. More specifically, we took into account the period 2001-2011, by means of Census of Industry and Services data, which have been recently made available for year 2011, and made comparable between the previous census. Following the mainstream literature on urban growth (e.g. Glaeser et al., 1995), the economic performance of Cities has been

conceptualised in terms of growth in jobs. An increase in employment can be considered as a proxy for economic and it is likely to be linked to structural change and investment made on cities. Moreover, increase in jobs, as well population, can indicate a higher degree of attractiveness of cities linked to new opportunities, high wages (which are in turns related to high productivity of the labour force) and quality of life.

This section reports the main results of the analysis carried on by considering growth in jobs. Apart from the sake of simplicity, there are some reasons to consider employment instead of population changes. This because Italian population is characterised by low residential mobility, if compared with other contexts. Moreover, during the last decades population growth has been driven mostly by migration of foreign people. In some cases it derives from regularization of people irregularly living in the areas: so population growth might be “artificial”, while jobs growth is less affected by this phenomenon. Finally, in most populated areas, which are interested by suburbanization phenomena, negative variations of population may not necessarily imply a weakening of their economic base. We first investigated the relationships between urban growth and size, and then the between urban growth and urban hierarchy. Finally, we linked size and hierarchy, by taking into account regional heterogeneity, which characterises urban dynamics: in order to do so, we considered the four Italian macroregions – North-west, North-east, Centre, South.

Urban growth and size

The decade 2001-2011 has been characterised by a general growth of jobs in Italian FUAs, even taking into account the effects of economic crisis which started in late 2008. Employment increased by 3%, affecting mostly the private sector, which increased jobs by 4.7%, while public sector dropped by 10.5%.

However, Italy shows a high heterogeneity in the performance between FUAs. The largest share of growth has taken place in metropolitan systems, which on average have been increased by 3.2%, while small cities (from 100,000 to 250,000 inhabitants) have been characterized by a growth rate considerably lower (1.5%). However, the performance of medium cities has been considerably high and slightly higher than large cities, both considering growth rate in jobs (respectively 3% and 2.9%) and local units of firms (12.5% and 10.3%). Table 6 reports growth rates of jobs and local units of firms by size classes, and the contribution of each class of cities to the total growth.

Table 6
Growth rates of jobs and local units and percentage contribution to growth rates of clusters of cities

	Jobs		Local units of firms	
	Growth rate	% contribution to growth	Growth rate	% contribution to growth
Small cities	1.5%	0.2%	9.7%	1.2%
Medium cities	3.0%	0.2%	12.5%	0.7%
Large cities	2.9%	0.2%	9.5%	0.7%
Metropolitan systems	3.2%	2.0%	10.3%	6.1%
Total	2.8%	3%	9.8%	9.8%

Source: IRPET elaboration from ISTAT data

Economic performance in terms of job growth shows also a high territorial heterogeneity which is linked to a phenomenon of convergence between regions. Southern regions showed the highest growth rates, while Northern regions showed the worst performance, especially those of North-Eastern Italy. Central Italy was characterised by an average growth by 2.22% (Table 7).

Table 7
Growth rates of jobs by macroregion (% values)

Macroregion	Average growth rate	Standard deviation	mimumum	maximum
North-West	1.35	7.82	-15.22	21.06
North-East	0.70	6.54	-15.63	17.91
Centre	2.22	5.99	-10.43	15.06
South	5.72	8.65	-10.52	38.69

Source: IRPET elaboration from ISTAT data

By considering simultaneously the territorial and the dimensional aspects, a high level of heterogeneity is evident. In fact, Southern regions, which have shown the highest growth rates, have been characterized by the best performance of large cities (+5.7%), while Central and North-Eastern regions have shown high growth rates from medium cities (Table 8).

Table 8
Growth rates of jobs by macroregion and size of FUAs (% values)

	Small cities	Medium cities	Large cities	Metropolitan areas
North-West	1.1%	-1.1%	3.0%	1.2%
North-East	0.1%	3.5%	2.0%	--
Centre	2.5%	7.1%	0.4%	11.9%
South	4.2%	4.4%	5.7%	0.4%

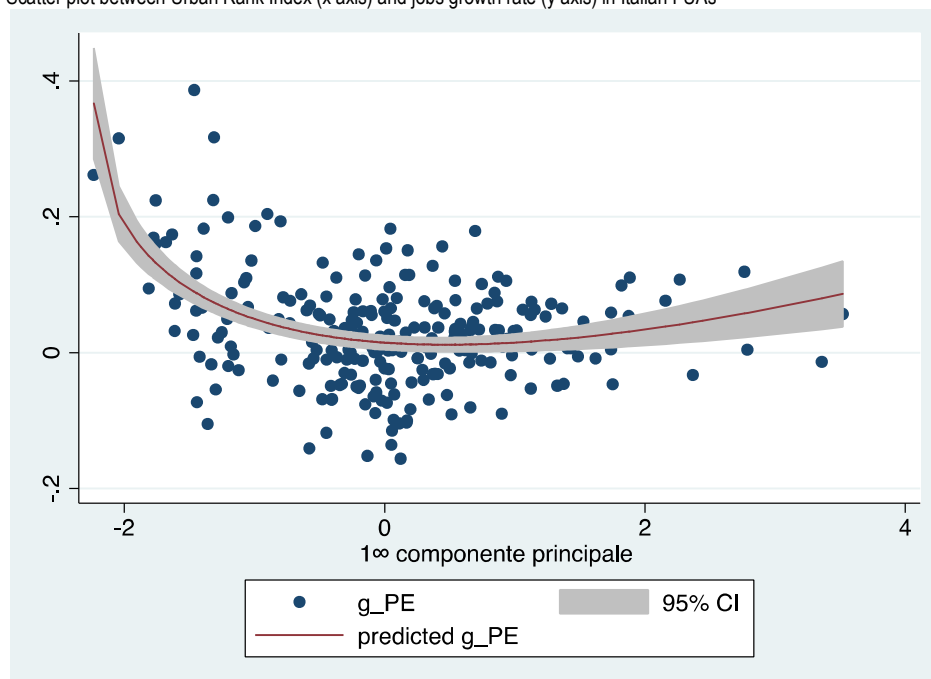
Source: IRPET elaboration from ISTAT data

Urban growth and hierarchy

The next step of the analysis was to investigate the relationship between urban growth and hierarchy, where hierarchy is declined in terms of supply of urban services, as described in the previous section of the paper.

Looking at the plot between Urban Rank Index and jobs growth rate, we can see that there is not a clear relationship (Fig. 2). When taking into account all FUAs, it seems that urban dynamic is negatively related to hierarchy for low rank cities (i.e. with a value of Urban Rank Index less than 0), while, when taking into account top rank cities the relationship appears to be positive. Jobs showed an increase by 2.5% in urban areas which presented a value of urban rank lower than 0 (36 observations) and 1.5% for FUAs with an index between 0 and 1 (62 observations). Then, it was 3.3% for FUAs with index between 1 and 2 (22 obs) and 4.9% for the eight cities which have the value of the urban rank index higher than 2.

Figure 2
Scatter plot between Urban Rank Index (x axis) and jobs growth rate (y axis) in Italian FUAs



Source: IRPET elaboration from ISTAT data

The relationship between urban rank and growth is linked with size. Economic dynamics are differentiated according to the demographic class. In small cities a high value of the Urban Rank Index is linked with high growth rate, while the same level of rank has been associated with lower growth in medium cities (Table 9).

Table 9
Growth rates of jobs by demographic size and classes of Urban Rank Index (% values)

		Size				
		Small cities	Medium cities	Large cities	Metropolitan areas	total
Urban Rank Index	very low	2.4%	3.6%	---	---	2.5%
	low	0.6%	3.2%	6.4%	3.0%	1.5%
	medium	1.9%	3.8%	2.8%	---	2.6%
	high	9.2%	1.4%	---	4.1%	4.3%
	total	1.6%	3.4%	3.3%	3.8%	2.1%

Source: IRPET elaboration from ISTAT data

At the same time, growth dynamics show a high degree of spatial heterogeneity. Taking into account both the Urban Rank Index and the geographic area (macroregion), results show that, while in general high values of Urban Rank index are associated with high growth rates in all areas, in North-Western regions the highest growth has been shown by urban areas with relatively low values of the Urban Rank Index (between 0 and 1). The highest growth values are represented by urban areas in central Italy characterized by Urban rank index between 1 and 2: as seen in the previous section, those are generally medium sized cities with a relatively high value and quality of the urban services provided (Table 10).

Table 10
Growth rates of jobs by macroregion of Urban Rank Index (% values)

	Urban Rank Index			
	< 0	between 0 and 1	between 1 and 2	>2
North West	0.4%	2.3%	-0.1%	1.9%
North East	-0.4%	-0.1%	1.7%	5.7%
Centre	2.1%	1.9%	6.8%	6.0%
South	5.4%	1.6%	4.7%	---
Total	2.5%	1.5%	2.6%	4.3%

Source: IRPET elaboration from ISTAT data

In particular, focusing on small and medium sized cities, it appears that in North-Eastern and Central cities the Urban Rank Index is positively related with urban growth, while in North Western and Southern regions there is respectively no relationship and negative relationship. Hence, urban dynamics of small and medium sized cities appear to be highly associated with geographical factors (Table 11).

Table 11
Correlation coefficient between urban growth and Urban Rank Index, by macroregions and demographic dimension (% values)

	small and medium	large and metro
North West	7%	-4%
North East	27%	-53%
Centre	20%	49%
South	-31%	-72%

Source: IRPET elaboration from ISTAT data

4. Discussion and concluding remarks

This paper aimed to shed some light on the role of small and medium sized cities for urban growth in Italy. Answering to that question involved some preliminary questions, regarding the definition of cities and their boundaries. Following the existing literature we applied a functional concept of cities, by adopting Functional Urban Areas, which in Italy coincide with Local Labour Systems and we merged those FUAs which belong to the same Urban Morphological Zone.

We then proposed a method to classify cities according to the urban functions and position them in the urban hierarchy. In fact, apart from demographic size, other factors can affect the rank of a city within national urban hierarchy, such as economic specialization/diversity, presence of advanced services (hi-tech, knowledge services, cultural services, etc.). Hence, we developed a multidimensional index for urban functions: the Urban Rank Index. As expected, the Urban Rank Index was positively related to population. However, in some cases urban size and urban rank diverged. This is particularly interesting when focusing on small medium sized cities. In fact, some small and medium cities are characterized by a high level and quality of the urban services provided, being for instance specialized in knowledge intensive sectors. This holds especially for some cities in Central and North-Eastern Italy, where polycentric systems of medium urban areas with relatively high rank in Italian urban hierarchy emerged: for instance, this is the case of Emilia-Romagna where other cities apart from a large centre (Bologna) do present high urban rank (Parma, Modena, Ferrara, Reggio-Emilia), and the case of Tuscany, where two small cities, Pisa and Siena, do present values of the urban rank comparable with those of large cities.

The article then reported some results of an explorative analysis on the link between dimension and urban growth in the decade 2001-2011, by means of Census data. We considered both population size and urban rank. Urban growth has been expressed in terms of jobs creation. During the last decade metropolitan systems showed the highest growth rates. If growth rate of medium cities has been comparable with large and metropolitan cities, small cities showed a slower growth. However, this result is characterized by a high degree of geographical heterogeneity, since employment dynamics differentiated across regions, being higher in Southern and Central Italy (indicating a dynamic of convergence between regions in the period). By combining size and geography, we found that large cities were the key players in Southern Italy, while in Central and North-Western Italy medium cities showed the highest growth rates. When considering urban rank instead of demographic size, we found that the top-rank cities showed the highest growth rates. However relationship between urban rank and performance appears to be not clear and, for low rank cities it appears to be negative. When linking urban rank with size, it appears that the former can have a key-role in small

cities. Small urban areas with high rank showed considerably high growth rates in jobs. The same holds for metropolitan areas. While in metropolitan areas this result can be linked with structural change involving increasing importance of urbanisation economies and knowledge-intensive services, in small cities a high rank, which have been generated by the provision of advanced services, may have acted as substitute for size in generating agglomeration economies.

As for demographic size, results for urban rank showed a high degree of geographic heterogeneity. In particular, notwithstanding that highest rank cities showed the best performance in almost all regions, in Central and North-Eastern small and medium cities the urban rank is positively associated with growth, while it seems to not be relevant in North-Western Italy, and negatively associated with growth in Southern Italy. Urban dynamics of small and medium sized cities appear to be highly associated both with geographical factors and their position in the national urban hierarchy. In some cases, which are found in specific areas of Italy economic mechanisms may have played a role and acted as substitutes for dimension in exploiting agglomeration externalities, ending up in relatively high growth of jobs. Hence, from our explorative analysis, it appears that there is no an optimal size for Italian urban areas, but it depends on the geography, on economic structure and on the urban services and amenities provided. Those factors can be crucial for the development of cities in Italy, which are mostly experiencing a mature phase of urbanization, being their demographic growth bounded by several constraints.

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