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The Impact of Distributive Services on the Productivity Growth: The Case of Italian Industrial Districts

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Abstract:

The relationship between tertiary activities and productivity growth has been extensively studied over the past decades. Research has shown that, within tertiary activities, distributive services play a key role in this dynamic. This framework overturns the traditional view of services as unproductive activities, usually responsible for a structural burden that slows down the evolutionary dynamics of the economic system. Given the slow pace with which the process of modernization of services is moving forward, Italy seems to be making an important exception to this general conclusion. It should be noted that empirical research that approached this problem in the past was usually based on data at the national level. Such an approach does not consider the strong heterogeneity that usually exists between territorial clusters within a nation. In order to overcome such limitations, this paper focuses on the impact of distributive services on productivity growth at the local level, using the Italian industrial districts as a unit of analysis.

The results show that in industrial districts the growth of the employment share of distributive services is the consequence of a positive integration with the industrial activities. In the industrial districts, in addition, distributive services make a positive contribution to the productivity growth of the whole economy and to the productivity growth of the industrial sector, confirming that no structural burden seems to be at work. On the contrary, non-district manufacturing areas do not show such positive trends, thus confirming the existence of a district effect.

Keywords: tertiarisation, distributive services, industrial districts, total productivity growth, industrial productivity growth.

JEL Classification: O14, O47, R10.

1. Introduction

It is widely recognized in economic and managerial literature that the growing weight of tertiarisation in modern economies has led to a deep reshaping of the relations between the tertiary sector and industrial activities, with a greater level of synergistic integration, which generates benefits in terms of productivity growth both at the firm and the general economic system level. This positive relationship appears weaker in Italy than in other developed countries. However, the studies conducted on the topic have considered the national average trends, without taking into account the strong territorial heterogeneity of the national economic system, which is the sum of very backward areas and modern and dynamic ones, such as those represented by clusters or industrial districts.

This heterogeneity raises the following issue: if (and how much) the relations between distributive services, industrial productivity and growth behave differently once evaluated at the local labour system (LLSs) level. To answer this question, an econometric model is estimated for the period 2001–2005, the only one for which data on value added of Italian LLSs are available. The paper is organized as follows: section 2 summarizes the literature on the relationship between distributive services and productivity growth and develops the research question; section 3 presents the data and the methodology used, and includes the econometric analysis; a discussion of the results and some concluding remarks are in section 4.

2. Distributive services and productivity growth: a positive relationship for the development of Italian industrial districts?

There is broad agreement among researchers that in modern and competitive economic systems a deep reshaping of the relations between industry and services is taking place. Value creation for customers is widely recognized as being increasingly influenced by the strategic integration between industrial and service activities. Distributive services, in particular, play a key role in this process, thanks to the growing contribution they offer to the competitive advantage of leading industrial producers. Managerial literature on this topic has been particularly prolific. For example, many studies have described the shift of market power to downstream services consequent to the growing ability of large distribution companies to influence consumer's choices (Pellegrini 1999, Pine and Gilmore 2000, Castaldo 2001, Varaldo and Dalli 2011). Additionally, there is general agreement on the fact that competitive advantage and brand recognition are strongly related to an effective control of distribution channels and logistic flows, which can be achieved through downstream vertical integration or through strategic relationships based on long-term contractual agreements (Oi 1992, Rullani 2006, Morelli 2008, Pellegrini 2008, Rullani 2012).

Also, economic literature has become interested in the problem. Several empirical studies, for example, have shown that the growth of employment in distributive services has a positive impact on both average labor productivity and TFP of national economies (Van Ark *et al.* 2003, Triplett and Bosworth 2004, Manser 2005, Inklaar and Timmer 2008, Inklaar *et al.* 2008). In addition, some general studies concerning the systemic consequences of tertiarisation have shown that distributive services (along with other special types of services such as KIBS) can sometimes speed up growth dynamics instead of generating a "structural burden", as suggested by the classical literature on tertiarisation (Baumol 1967, Castells 1972, Sylos - Labini 1974, Bacon and Eltis 1978). Most of this literature points out that services are a heterogeneous set, and when studying the implications of the tertiarisation process on productivity growth, distinctions have to be made between its single subsets, because they can sometimes behave very differently (Oulton 2001, Baumol 2002, Pugno 2006, Sasaki 2007, Maroto and Rubalcaba 2008, Maroto-Sanchez and Cuadraro-Roura 2009). In particular, distributive services show a significant growth of employment shares and contain factors such as innovation and human capital that make their productivity growth rates similar to, or even higher than, those of the most dynamic manufacturing industries. (Maroto-Sanchez and Cuadraro-Roura 2009, Maroto-Sanchez 2012, Maroto-Sanchez and Cuadraro-Roura 2013, Mei Ling 2013)

What both economic and management literature conclude, in a nutshell, is that modern and efficient distributive services can have positive effects on industrial competitiveness and on the global productivity growth of economic systems. Compared to this overall picture, the Italian situation has some peculiar features. The relationship between the distributive services and productivity growth appears weaker than in other developed countries for which studies are available (Pellegrini 1985, Pellegrini and Cardani 1993, Gordon 1996, Timmer and Inklaar 2005, Timmer and Ypma 2006, Bella and Mauro 2008). Some authors attributed this poorer performance to the slowness of the process of modernization of distributive services still strongly bound in that country to traditional and poorly dynamic models (a reality that only in recent years is beginning to change). Furthermore, for many years the distributive services have represented a "refuge sector" for unemployment created during the downturns of the economic cycle.

Testing the relationship between distributive services and productivity growth at the national level only, however, can lead to misleading conclusions. As is well known, the Italian productive system is characterized by the coexistence of very backward areas with modern and dynamic ones; the latter often organized in industrial districts of great vitality. This heterogeneity of the production system raises questions on what lies "beneath the national averages", and in particular if (and how much) the relationship between distributive services, industrial productivity and growth behave differently once evaluated at the local-system level.

This research question rests on a sound theoretical basis. Several studies have shown that the interactions between industry and services, and in particular those with distributive services, can be much more effective within local systems, such as industrial districts, where relevant external economies contribute to competitiveness (Spithoven 2000, Peneder 2002, Peneder 2003), and spatial proximity makes the reorganization processes easier (Boschma 2005). The industrial districts play a central role in the Italian development model (Signorini 2000, Bellandi 2002, Sforzi 2002, Signorini and Omiccioli 2005, Becattini and Coltorti 2006, Becattini and Dei Ottati 2006, Quintieri 2006, Corò and Micelli 2007, Becattini *et al.* 2009, Di Giacinto *et al.* 2014). In detail, the consistent body of literature has been accumulating on a large number of specific issues that span from social and cultural aspects (Dei Ottati 2005, Lorenzini 2011) to internationalization (Chiarvesio *et al.* 2010), innovation factors and analysis of new specialization areas (Amighini and Rabellotti 2006, Muscio 2006, Rabellotti *et al.* 2009, De Marchi *et al.* 2014).

However, still there are few empirical studies devoted to the role and the effects of tertiarisation (De Rita and Varaldo 2006, Rullani 2006, Busato and Corò 2011).

In particular, works on the specific role of distributive services seem to be almost completely missing. In order to help overcome this gap, this paper tests whether in Italy, at the local level, the growth of the employment share of distributive services has a positive impact on aggregate productivity growth and on the productivity growth of the industrial sector. For this purpose, data provided by ISTAT (the Italian Institute of Statistics) on the local labor systems (LLSs) for the period 2001–2005 are taken into account. The choice of the unit of analysis allows for overcoming the limitations and distortions related to the use of NUTS 2 or NUTS 3 data, which are based on administrative boundaries, not related with the territorial structure of productive systems. The reference period is the only one for which data on added value are available at the LLSs level.

The following analysis has two main elements of novelty: to the best of our knowledge no studies on the relations between distributive services, industrial productivity and growth, at this level of disaggregation, are available; furthermore, our results show some features of industrial districts not underlined until now by other studies. The first is that during the period under observation, in industrial districts, the growth of the employees in distributive services does not correspond to an occupational loss for industrial activities. Instead, in the rest of the Italian production system, they tend to incorporate workers expelled by the industrial sector without creating additional employment. In this context, the distributive services behave as an “occupational sponge”.

The second is that in industrial districts the increase in the employment share of distributive services does not imply the accumulation of a “structural burden”, thanks to a productivity growth rate higher than average. Moreover, distributive services show a positive impact on industrial productivity growth, confirming the existence of a synergistic integration between the distributive services and industrial activities. Neither trend occurs in manufacturing non-district LLSs.

3. Empirical analysis

3.1. Description of the data and methodology

In line with the traditional approach used in the empirical literature, the reference economic unit considered in this analysis is the LLS. The data on LLSs have been elaborated according to the Statistical Atlas of Municipalities and considering the ISTAT Census of industry and services for the year 2001. For 2005, data on employees were derived from the archive ASIA (ISTAT). The data on value added for 2001–2005 were taken from the publication on the added value of LLSs provided by ISTAT in 2008. The data for 2001 and 2005 are fully comparable.

LLSs play an important role because they express, on one hand, the territorial organization of economic activities and, on the other hand, the related movements of the population. “The LLS represent the places of everyday life for the people who live there and work there (and who tend to concentrate there most of their social and economic relations). We are talking about territorial units consisting of multiple neighboring municipalities, with the same geographical and statistical characteristics” (ISTAT 2005). They are defined through the ISTAT census, based on daily commuters’ flows; they are represented by a centroid municipality, which is the gravitational center. The LLSs are, therefore, an appropriate instrument of analysis to investigate the socio-economic structure of Italy, according to a local development perspective.

The methodology based on the 2001 ISTAT Census identifies 686 LLSs in the Italian territory. To locate mainly manufacturing LLSs, the first step is to calculate, for each of the LLSs, a coefficient of territorial concentration relative to each of the economic activities included in the productive sectors of industry and services, corresponding to the entire local economy. The LLSs are considered manufacturing when the coefficient of territorial concentration of employees in manufacturing is higher than the national average.

To identify district LLSs, a multi-stage process is applied. This process includes: (a) the identification of the local manufacturing system; (b) the identification of local manufacturing systems that are small and medium sized (SME), such as those in the size class 1–249 employees; (c) the identification of the predominant manufacturing sector in each local system of SMEs; (d) the labeling of the local system of manufacturing SMEs as an ID when its main industry is predominantly made up of SMEs (ISTAT 2001)⁹. The industrial districts defined in the 2001 ISTAT

⁹ The LLSs and industrial districts have been identified by ISTAT by adopting the methodology present in Sforzi and Lorenzini (2002). However, there are other classifications of industrial districts. On one hand, the districts are identified according to administrative criteria, through regional laws 37/1991 and 140/1999, and the districts are “geographical areas characterized by high concentration of small and medium-sized enterprises, with particular reference to the relationship between the presence enterprises and the resident population, as well as the specialized production enterprises”. On the other hand,

Census are 156. In 2005, districts accounted for 27% of total employees and 39% of manufacturing employees (Sforzi 2009).

The ISTAT services classification distinguishes: market services, which include distributive services, services provided by hotels and restaurants, transport services and business services; and non-market services, which include, mainly, public administration activities¹⁰. In order to identify and investigate the dynamics exclusively related to the production system, only firm employees have been taken into account, discarding employees in public bodies and non-profit entities. Furthermore, the total employees in each LLS is calculated as the sum of industry and services employees¹¹, thus excluding classes A (agriculture, hunting and forestry) and B (fishing, fish farming and related services) of the Nace Rev. 1.1 classification, as the data provided by ISTAT do not include labor units and the value added figures for these sectors in 2005. However, this is not an issue, as the aim of this work is to focus on the relationship between distributive services and ID-type manufacturing systems. Lastly, figures concerning hotel and restaurant services have not been taken into account, as these two segments are not relevant for the purpose of the present work.

3.2. Early insights form the descriptive analysis of different Local Labour Systems

In this section we show the descriptive statistics referring to the variables considered in the analysis of the 156 industrial districts (ID LLSs). The results are compared with other LLSs to detect the different trends. First, we consider the performance of the 136 manufacturing non-district LLSs (Man.Non-ID LLSs). This allows us to verify if within manufacturing LLSs, districts show more favorable trends than non-districts. Second, we consider the performance of 394 non-manufacturing LLSs (Non-Manuf. LLSs). This allows us to compare the performance of districts with areas traditionally characterized by a greater presence of services. Finally, we consider the 686 total LLSs (total LLSs) to compare the performance of districts with the national average.

Table 1 - Descriptive statistics. Variables

VARIABLE	ID LLSs (156)		Man.Non-ID LLSs (136)		Non-Manuf. LLSs (394)		Total LLSs (686)	
	Mean	Std. Dev	Mean	Std.Dev	Mean	Std. Dev	Mean	Std. Dev
GPUL	0.022	0.021	0.019	0.019	0.009	0.028	0.014	0.026
GPUL_IND	0.033	0.031	0.027	0.034	0.020	0.037	0.024	0.035
PUL	10.942	0.149	11.025	0.144	11.107	0.226	11.053	0.208
WSER	0.417	0.076	0.475	0.091	0.641	0.079	0.557	0.128
GSER	0.025	0.015	0.024	0.019	0.009	0.014	0.016	0.017
WSERM	0.369	0.067	0.418	0.080	0.565	0.074	0.491	0.115
WSERNM	0.048	0.014	0.057	0.023	0.076	0.023	0.066	0.025
GSERM	0.020	0.017	0.017	0.019	0.003	0.016	0.010	0.019
GSERNM	0.059	0.047	0.067	0.053	0.047	0.059	0.054	0.056
WDSB	0.170	0.036	0.189	0.047	0.263	0.057	0.227	0.066
WTRA	0.045	0.017	0.057	0.022	0.070	0.030	0.062	0.028
WBUS	0.108	0.033	0.109	0.034	0.130	0.043	0.121	0.041

there are several sources (Il Sole 24 Ore, the Edison Foundation, Unioncamere) that are methodological assumptions, as well as static data, in field surveys. The ISTAT methodology, however, remains in some respects the most reliable. Among the advantages present, it is worth noting the possibility of adopting a conceptual grid that allows us to compare systematically the different situations and to follow trends over time, in order to make countless studies comparable on this topic (Signorini and Omiccioli 2005).

¹⁰ In line with the classification Nace Rev. 1.1, in industry includes the employees relative to the extraction of minerals (class C), to manufacturing (class D), production and distribution of electricity, gas and water (class E) and construction (class F). In services, they include those employees in the remaining classes (from class G to class Q).

¹¹ More specifically, market services (from class G to the class K of the Nace Rev. 1.1 classification) are those related to the "wholesale and retail trade, repair of motor vehicles, motorcycles and goods (distributive services); hotels and restaurants (services provided by hotels and restaurants); transport, storage and communication (transport services); financial intermediation; real estate, renting, information technology, research, other professional and business activities (business services)". The non-market services (from class L to class Q of the Nace Rev. 1.1 classification) are those related to "public administration and defense; compulsory social security; education; health and other social services; other community, social and personal services; domestic services at households; extraterritorial organizations and bodies".

VARIABLE	ID LLSs (156)		Man.Non-ID LLSs (136)		Non-Manuf. LLSs (394)		Total LLSs (686)	
	Mean	Std. Dev	Mean	Std.Dev	Mean	Std. Dev	Mean	Std. Dev
GDSB	0.009	0.020	0.006	0.025	-0.009	0.021	-0.002	0.023
GTRA	-0.003	0.035	-0.010	0.048	-0.020	0.054	-0.014	0.050
GBUS	0.028	0.033	0.030	0.037	0.003	0.037	0.015	0.038

Source: Own elaboration. ISTA data

Legend: GPUL (rate of total productivity growth for the years 2001–2005), GPUL_IND (rate of industry productivity growth for the years 2001–2005), PUL (productivity of the economic system in 2001, resulting from the ratio between added value and the number of labor units), WSER (share of employees in services in 2001), GSER (increase in the share of employees in the services for the years 2001–2005), WSERM (share of employees in market services in 2001), WSERNM (share of employees in non-market services in 2001), GSERM (increase in the share of employees in the market services for the years 2001–2005), GSERNM (increase in the share of employees in non-market services for the years 2001–2005), WDSB (share of employees in distributive services in 2001), WTRA (share of employees in transport services in 2001), WBUS (share of employees in business service in 2001), GDSB (increase in the share of employees in the distributive share for the years 2001–2005), GTRA (increase in the share of employees in the transport services for the years 2001–2005), GBUS (increase in the share of employees in the business services for the years 2001–2005).

Consistently with strong industrial characteristics, ID LLSs showed lower shares of service employees (*WSER*) in 2001 (41.7%) compared to the national average (55.7% for all the 686 LLSs) and the other LLSs. Indeed, the average share of service employees amounts to 47.5% for the 136 manufacturing non-ID LLSs and 64.1% for the 394 non-manufacturing LLSs. Although the increase in the share of service employees over the period 2001–2005 (*GSER*) characterize all the LLSs considered, this figure is higher (+2.5%), and with a lower standard deviation in the ID-type LLSs. For manufacturing non-ID LLSs and non-manufacturing LLSs, the increase in the share of service employees is, respectively, 2.4% and 0.9%, while it is only 1.6% when the total number of LLSs is considered. ID LLSs show a greater increase (2%) in the share of employees in the market service sector (*GSERM*), and a lower growth in the share of employees in the non-market services (*GSERNM*) than manufacturing non-ID LLSs. This performance is likely due to the strong presence of industries within the districts that require services, including market services, to carry out their activities. These trends are associated with more significant increases of the total and industrial productivity in ID-type systems (GPUL 2.2% and GPUL_IND 3.3%) compared to manufacturing non-ID LLSs (GPUL 1.9% and GPUL_IND 2.7%), non-manufacturing LLSs (GPUL 0.9% and GPUL_IND 2.0%) and the whole set of LLSs (GPUL 1.4% and GPUL_IND 2.4%).

When sub-categories of market services are investigated, the lower initial share of each single service category (*WDSB*, *WTRA*, *WBUS*) in IDs is confirmed, but the share of employees in distributive services shows a more significant growth and a lower variability (*GDSB*) than other LLSs. Conversely, IDs are characterized by an increase in the share of transport (*GTRA*), which is lower than that of other LLSs; the increase in the share of business services (*GBUS*) in ID LLSs is lower than manufacturing non-ID LLSs.

An important feature of the Italian economy to consider is the coexistence of two very different geographic macro-areas - Centre-north and south - in the industrial development of the economic system. The degree of industrialization, calculated as the weight of the industrial employees on the total employees in 2001, is only equal to 14% in the south. This value is much smaller than the degree of industrialization of the Centre-north (26%) and the national average (22.9%). The low level of industrialization of the south is reflected in the presence of manufacturing LLSs and district LLSs: the manufacturing LLSs in the south are in fact only 37.7% of the total LLSs; instead in the Centre-north the manufacturing LLSs represent a large share in the total LLSs (59.3%). In this context, the weight of the industrial districts in the south plays a minor role compared to the other areas of the country. Indeed, the industrial districts only represent 8% of the total LLSs in the south, while industrial districts represent 36% of the total LLSs in the Centre-north (Table 2).

Table 2 - Weight of industrial district on total LLSs, on manufacturing LLSs and degree of industrialization for geographical areas, 2001.

	% ID on Total LLSs	% ID on Manuf. LLSs	Degree of industrialization
Centre-north	36.0	59.3	26.0
North-west	34.1	52.0	29.0
North-east	35.3	61.8	28.0
Centre	38.3	64.5	20.0
South	8.0	37.7	14.0
Italia	22.7	54.2	22.9

Source: Own elaboration. ISTAT data

Delving into the relationships characterizing the dynamics related to the tertiarisation process, a linear correlation analysis is carried out (considering a significance level of 1%) in order to assess the nature and the extent of the link between the growth of the share of service employees and either the growth of the total number of employees (Table 3) or the growth of industry employees (Table 4).

Table 3 shows that for industrial districts, there is a particularly strong relationship between the increase in the number of employees in the service sector and the growth of total employees. The correlation index for the two variables, in fact, is quite high (0.91) compared to manufacturing non-ID LLSs (0.71). Distributive and business services are the service categories more heavily influencing the dynamics of districts.

Table 3 - Correlation index between employee growth in single service categories and total employee growth

	ID LLSs (156)	Man.Non-ID LLSs (136)	Non-Manuf. LLSs (394)	TOTAL LLSs (686)
Distributive services	0.8329*	0.6878*	0.9399*	0.9203*
Transport services	0.5444*	0.0777	0.4954*	0.4654*
Business services	0.8908*	0.5890*	0.9571*	0.9443*
TOTAL services	0.9148*	0.7151*	0.9745*	0.9633*

Source: Own elaboration. ISTAT data

Note: * Significance 1%

The correlation between the growth of employees in distributive services and the growth of total employees amounts to 0.83 for IDs against 0.68 for manufacturing non-ID LLSs; quite similar is the situation for business services, for which the values of the correlation are 0.89 for IDs and 0.58 for manufacturing non-ID LLSs. As expected, for non-manufacturing LLSs, employee growth in services shows a stronger correlation with the total employees. In these areas, in fact, services have a greater role within the economic system.

Table 4 shows the results of the correlation between employee growth in the service sector and the employee growth in the industry sector. The correlation index between these two variables is negative and statistically significant for the manufacturing non-ID LLSs under study, while there is no such correlation in the ID LLSs. In detail, the correlation index is -0.53 for manufacturing non-ID LLSs. These figures suggest the existence of a "substitution effect" between industry and service employees in manufacturing non-ID LLSs, while this trend does not occur in the districts where there is no such correlation. The employee growth in the service sector within the districts, in fact, seems to be autonomous and virtuous enough to avoid a "sponge effect"; services do not absorb employees excluded from other productive sectors.

This trend, which characterizes the districts, seems to be more significant for distributive services that show a correlation index with industry employees next to zero (-0.0043). Instead, for manufacturing non-ID LLSs under examination, this correlation seems to confirm the presence of a substitution effect; it is equal to -0.46 (with statistical significance at 1%). As expected, there is no correlation between the growth of employees in services and the growth of employees in industry within the non-manufacturing LLSs. This happens because in these areas there is a greater tendency towards tertiarisation compared to industrialization.

Table 4 - Correlation index between employee's growth in single service categories and industrial employee's growth

	ID LLSs (156)	Man. Non-ID LLSs (136)	Non-Manuf. LLSs (394)	TOTAL LLSs (686)
Distributive services	-0.0043	-0.4613*	0.0578	-0.0079
Transport services	-0.1454	0.5793*	-0.0504	0.0439
Business services	-0.1645	-0.6233	-0.0995	-0.1315*
TOTAL services	-0.1663	-0.5373*	-0.0890	-0.1242*

Source: Own elaboration. ISTAT data

Note: * Significance 1%

3.3. Econometric analysis

The previous section highlights the role of services in the considered LLSs. Distributive services emerge as a very important category in the growth of services, and differences in the dynamics of this subsector characterize ID LLSs compared to the other LLSs. Distributive services in fact seem to have two important characteristics. They are positively correlated to growth of total employees in the LLSs; moreover, they do not seem related to a weakening of the industrial structure. Indeed, the greater share of employees in the distributive services is not associated with a decrease in employees in the industrial sector. These trends seem to occur more evident in the industrial districts.

In this section, the relationship between distributive services and productivity will be tested through an econometric model. In particular, we will test if an increase in the share of employees in the distributive services is relevant to explain the productivity growth. The expected result is positive, in line with recent studies; these studies have indeed shown that some kinds of services have a positive impact on the productivity growth in advanced economies; this framework overturns the traditional view of services as unproductive activities that generate a structural burden (Baumol 1967, Maroto-Sanchez 2012). Based on this assumption, the distributive services can have a positive impact on the productivity growth. In addition, on the basis of the positive integration between distributive services and industry highlighted in the previous section, this work introduces a further new element: we will test if an increase in the share of employees in the distributive services has a positive impact on the industrial productivity growth. In order to verify these relations, an ordinary least square (OLS) regression model in a cross-section was used. The model is tested for 156 industrial districts LLSs, and the results are suitably compared with the other LLSs (manufacturing non-ID LLSs—136; non-manufacturing LLSs—394; national total LLSs—686). These comparisons allow us to consider whether the industrial districts show peculiar trends than other LLSs.

For starters, we will test if an increase in the share of employees in the distributive services has a positive impact on the total productivity growth. Additionally, two other explanatory variables are included: the initial level of productivity and the initial share of employees in the distributive services¹². We also include the initial productivity level in the model, because it allows us to consider whether the differences in productivity between LLSs are decreasing. Indeed, a negative relationship between the level of initial productivity and productivity growth rates indicates the presence of a convergence process, reducing disparities (Barro and Sala-i-Martin 1992). Moreover, geographical dummies (*North-west*, *North-east* and *Centre*) are included in the model in order to control the existence of spatial autocorrelation phenomena and the significant differences between advanced and backward areas¹³. Hence, the model is formulated as follows:

$$GPUL_i = \alpha + \beta_1 PUL_i + \beta_2 WDSB_i + \beta_3 GDSB_i + \text{North_west}_i + \text{North_east}_i + \text{Centre}_i + \mu_i \quad (3.1)$$

where $i = 1, 2, N$ is the LLSs in the sample, μ_i is the error term and GPUL represents the total productivity growth rate over the period 2001–2005. GDSB represents the increase in the share of employees in the distributive services over the years 2001–2005. PUL represents the initial level of productivity in 2001. Productivity is measured as the ratio between the added value at constant prices and the number of labor units based on ISTAT data. WDSB is the share of employees in distributive services in 2001 (on the total employees).

Study results are summarized in Table 5. The main result is that the increase in the share of distributive services over the period 2001–2005 (GDSB) has a positive impact on the total productivity growth in the industrial districts (column 1). The estimations are statistically significant (at the 1% level).

¹² The source of every variable included in our model is the ISTAT database.

¹³ Rodriguez-Pose (1999) demonstrates that the inclusion of geographical dummies minimises spatial autocorrelation problems.

Instead GDSB does not impact the total productivity growth in manufacturing non-ID LLSs (column 2). As in ID-LLSs as well, in non-manufacturing LLSs GDSB shows a positive impact on the total productivity growth (column 3). Moreover, the share of distributive services in 2001 (WDSB) makes a positive impact on the total productivity growth within the 156 ID LLSs (column 1) and it is also statistically significant (1%). With reference to the manufacturing non-ID LLSs, the results obtained are qualitatively confirmed, but the coefficients in this case are significantly lower (column 2). These results show the peculiarity of the relationship between distributive services and the district system. Indeed, in the ID LLSs the initial share of employees in distributive services and an increase in the share of employees in distributive services have a more positive effect on the total productivity growth than the manufacturing non-ID LLSs.

The β_1 coefficients of the initial level of productivity are statistically significant and negative, confirming the presence of a convergence effect. The LLSs that show a lower level of productivity in 2001, thus, obtain a higher productivity growth rate than the others over the period 2001–2005. In the industrial districts the convergence effect is higher than the other LLSs considered; indeed, the coefficient β_1 in industrial districts shows higher values. This means that LLSs weaker in terms of productivity have a greater probability of reducing the gap with more advanced LLSs if they are industrial districts. The goodness of the results of geographical dummies testifies the presence of strong regional disparities. Districts located in Northern Italy show better results, but also those located in the Centre show positive results, albeit at lower levels. The explanatory capacity of the model, through its R-squared, is acceptable, and in ID LLSs (0.39) is higher than other LLSs considered.

Table 5 - Distributive services and total productivity growth¹⁴ - Model 1

	(Col. 1) ID LLSs	(Col. 2) Man.Non-IDLLSs	(Col. 3) Non-Manuf. LLSs	(Col. 4) Total LLSs
PUL	-0.0924668 (0.0138785)***	-0.0371961 (0.0123759)***	-0.059048 (0.0058553)***	-0.0588888 (0.0049124)***
WDSB	0.1881445 (0.0609233)***	0.100934 (0.0353415)***	0.0287402 (0.0245077)	0.0698041 (0.0188318)***
GDSB	0.2662488 (0.0737709)***	0.1241734 (0.0889595)	0.3451419 (0.0741855)***	0.2710152 (0.0550861)***
North-west	0.023014 (0.0059856)***	0.0149447 (0.0045501)***	0.0108915 (0.0040916)***	0.0147499 (0.002505)***
North-east	0.0207329 (0.0055347)***	0.0069832 (0.0050197)	0.0056092 (0.0043364)	0.0100743 (0.0026821)***
Centre	0.0159073 (0.0052906)***	0.0077572 (0.0044407)*	0.02058 (0.003391)***	0.0148787 (0.0023487)***
Vif (Mean)	1.93	1.36	1.26	1.48
F stat.	11.21	3.57	29.26	44.29
R-squared	0.3900	0.1406	0.3368	0.3195
n. obs.	156	136	394	686

Source: Own elaboration. Data ISTAT. OLS cross-section regression model. Constant coefficient not shown, although it was included in the model. Corrected standards errors in parentheses. *** Statistical significance level at 1%; ** statistical significance level at 5%; * statistical significance level at 10%.

We must consider that the total productivity growth is also influenced by other variables, such as other kinds of services. Hence, a series of control variables are included in the regression: the other kinds of market services and the non-market services¹⁵. Indeed, the literature has shown, firstly, that generally only the market services have a significant role in explaining the productivity growth and, secondly, that there are marked differences in performance between the several kinds of market services (Oulton 2001, Sasaki 2007, Maroto-Sanchez and Cuadraro-Roura 2009).

¹⁴ In Table 5 as well as in the other tables the data of the constant is not reported, as it appears of little interest for this type of analysis.

¹⁵ In the database on LLSs other data commonly used as control variables in the literature (innovation, education, exports) are not available. Nevertheless, it is believed that the inclusion of geographical dummies allows us to identify in large part the structural differences within the Italian economy.

Based on these assumptions, in model 3.2 the performance of distributive services is compared both with the non-market services and with the other kinds of market services.

The other kinds of market services are included in the model: transport (WTRA) and business (WBUS) services, which represent the share of employees in each respective subsector in 2001, and *GTRA*, *GBUS*, which represent the growth in the share of employees in each respective subsector over the period 2001–2005. In addition, non-market services are included in the model: *WSERNM* (represents the share of employees in the non-market services in 2001) and *GSERNM* (represents the growth in the share of employees in the non-market services over the years 2001–2005). With the inclusion of these variables, the specification of the econometric model becomes:

$$GPUL_i = \alpha + \beta_1 PUL_i + \beta_2 WDSB_i + \beta_3 WTRA_i + \beta_4 WBUS_i + \beta_5 WSERNM_i + \beta_6 GDSB_i + \beta_7 GTRA_i + \beta_8 GIMP_i + \beta_9 GSERNM_i + \text{North_west}_i + \text{North_east}_i + \text{Centre}_i + \mu_i \quad (3.2)$$

Study results are summarised in Table 6. The main result is that distributive services emerge as the main kind of services in the impact on overall system productivity growth, and differences in the dynamics of this subsector characterise ID LLSs (column 5) compared to manufacturing non-ID LLSs (column 6). Indeed, the growth in the share of employees in the distributive services (GDSB) and the initial share of employees in the distributive services (WDSB) have a positive effect on the total productivity growth in the industrial districts.

The analysis of sectoral change dynamics for the years 2001–2005 confirms the existence of a positive relationship between GDSB and the total productivity growth of ID systems shown in Table 5. This relationship is confirmed by a high coefficient and a good explanatory power of the model (the R-squared is 0.449, see column 5). Instead, GDSB does not impact the total productivity growth in manufacturing non-ID LLSs. Indeed, concerning the manufacturing non-ID LLSs, this relationship becomes not statistically significant (column 6). In the other LLSs, the coefficients and the explanatory power of the model are reduced (columns 7-8). The growth in the share of employees in transport services (GTRA) also seems to have an interesting role in the ID LLSs, but less strong than in the distributive services.

For ID LLSs WDSB and WTRA have a positive and statistically significant impact on the total productivity growth. When considering other LLSs, we can see interesting differences compared to IDs dynamics. The role of the initial share of distributive services is much stronger within IDs; the coefficients, in fact, are more robust and statistically significant compared to those reported for other LLSs. Summarising, in the industrial districts, a higher initial share of the distributive and transport services generates a higher productivity growth than the rest of the production system.

Non-market services (*WSERNM* and *GSERNM*) do not seem to show a statistically significant impact on the productivity growth in the industrial districts. This confirms the results of the literature (Baumol 2002, Triplett and Bosworth 2004, Maroto and Rubalcaba 2008, Maroto Sanchez and Cuadraro Roura 2009) on the question that the different kinds of services show a heterogeneous impact on the productivity growth.

These variables instead take positive and statistically significant values, albeit lower, when considering the 394 non-manufacturing LLSs (column 7). Indeed, these LLSs have a weight of non-market services that is much higher than the manufacturing LLSs. The β_1 coefficients of the initial level of productivity are statistically significant and negative; therefore, this confirms the presence of the convergence effect shown by model 1. Also in this case, the coefficient β_1 shows higher values in the industrial districts, confirming the presence of a greater convergence effect compared to the others considered LLSs. These results highlight the peculiarity of the relationship between distributive services and the district system. The territorial dummies confirm the same trends described in Table 5. The explanatory capacity of the model, through its R-squared, is acceptable, and in ID LLSs (0.449) is higher than other LLSs considered.

Table 6 - Distributive services and total productivity growth - Model 2

	(Col. 5) ID LLSs	(Col. 6) Man.Non-ID LLSs	(Col. 7) Non-Manuf. LLSs	(Col. 8) Total LLSs
PUL	-0.0951376 (0.0127586)***	-0.0503229 (0.0149114)***	-0.0738649 (0.0067144)***	-0.0736275 (0.0054716)***
WDSB	0.1870048 (0.0717504)***	0.0939505 (0.0379184)**	0.0435191 (0.0252465)*	0.0644019 (0.0199427)***
WTRA	0.2389832 (0.0955651)**	0.0736024 (0.0492634)	0.1042856 (0.042094)**	0.1042311 (0.0336334)***

	(Col. 5) ID LLSs	(Col. 6) Man.Non-IDLLSs	(Col. 7) Non-Manuf. LLSs	(Col. 8) Total LLSs
WBUS	0.0704084 (0.0443671)	0.1334395 (0.0492634)***	0.0950472 (0.0304746)***	0.1042948 (0.021932)***
WSERNM	-0.143196 (0.1465466)	0.0678165 (0.0691842)	0.1525103 (0.0620492)**	0.1253375 (0.0462166)***
GDSB	0.3313817 (0.0848395)***	0.1416759 (0.0917579)	0.3200017 (0.0699994)***	0.2891726 (0.0517144)***
GTRA	0.0924429 (0.0528254)*	0.0589604 (0.0381653)	0.0329791 (0.0222968)	0.0458826 (0.0180527)**
GBUS	-0.0164126 (0.0555404)	0.1107567 (0.0615976)*	0.0948993 (0.0322398)***	0.0835622 (0.0255511)***
GSERNM	0.0293918 (0.0369195)	-0.0067285 (0.0342835)	0.043667 (0.0253855)*	0.0375032 (0.0191192)**
North-west	0.0209976 (0.0059099)***	0.0146859 (0.0047959)***	0.0077833 (0.0039761)*	0.014017 (0.0025146)***
North-east	0.0182464 (0.0060542)***	0.0084912 (0.0051452)	0.0076898 (0.0040785)*	0.0111164 (0.0026648)***
Centre	0.0167096 (0.0053616)***	0.0078411 (0.0049168)	0.0184847 (0.0033775)***	0.0142776 (0.002432)***
Vif (Mean)	1.97	1.53	1.33	1.53
F stat.	9.33	2.92	17.87	25.27
R-squared	0.4488	0.2158	0.3892	0.3744
no. obs.	156	136	394	686

Source: Own elaboration. Data ISTAT

Note: OLS cross-section regression model. Constant coefficient not shown, although it was included in the model. Corrected standards errors in parentheses. *** Statistical significance level at 1%; ** statistical significance level at 5%; * statistical significance level at 10%.

Another new element of this work is to verify the existence of a positive relation between distributive services and the strengthening of industrial activities. For this purpose, we analyse the impact of the growth in the share of employees in the distributive services on the industrial productivity growth. Hence, the model is formulated as follows:

$$\begin{aligned}
 GPUL_IND_i = & \alpha + \beta_1 PUL_i + \beta_2 WDSB_i + \beta_3 WTRA_i + \beta_4 WBUS_i + \beta_5 WSERNM_i + \beta_6 GDSB_i + \\
 & \beta_7 GTRA_i + \beta_8 GIMP_i + \beta_9 GSERNM_i + \text{North_west}_i + \text{North_east}_i + \text{Centre}_i + \mu_i
 \end{aligned}
 \quad (3.3)$$

where the dependent variable GPUL_IND represents the industrial productivity growth rate over the period 2001–2005. The other variables are the same as in model (3.2).

Study results are summarised in Table 7. The main result is that the distributive services are also confirmed in this case as the main kind of services; indeed, distributive services have very positive impact on the industrial productivity growth, and differences in the dynamics of this subsector characterise ID LLSs (column 9) compared to the manufacturing non-ID LLSs (column 10). Consequently, the growth in the share of employees in distributive services (GDSB) and the initial share of employees in distributive services (WDSB) have a positive effect on the industrial productivity growth in the industrial districts. The analysis of sectoral change dynamics for the years 2001–2005 confirms the existence of a positive relationship between GDSB and industrial productivity growth of industrial districts. This relationship is shown by a high coefficient statistically significant at a 5% level and a good explanatory power of the model (the R-squared is 0.447, see column 9). Instead, GDSB does not impact the industrial productivity growth in manufacturing non-ID LLSs (column 10). Indeed, concerning the manufacturing non-ID LLSs, this relationship becomes not statistically significant and the regression exhibits low “goodness of fit” overall (e.g. low values of R-squared—0.1833). In the other LLSs, the coefficients of GDSB are similar to IDs, but the explanatory power of the model is reduced (column 11). This trend is justified by the greater dynamism of services in non-mainly industrial areas.

For ID LLSs WDSB has a positive and statistically significant (1%) impact on the industrial productivity growth. The impact of WDSB on the industrial productivity growth is confirmed in the manufacturing non-ID LLSs

(column 10) while it is not statistically significant in the other LLSs (column 11). The growth in the share of employees in the transport services also seems to have an interesting role in the ID LLSs. Indeed, Table 7 shows that the increase in productivity of industry in the industrial districts is associated positively both to the initial share of transport services (WTRA) and to the growth in the share of employees in this sector (GTRA). If we consider that the transport services are often classified within distributive services (Micucci and Di Giacinto 2009), this result is further confirmation that the growth in the share of employees in the distributive channel has a positive impact on the productivity growth in the industrial districts. These trends do not occur in the manufacturing non-ID LLSs. The non-market services (WSERNM and GSERNM) confirm a non-statistically significant relation with the industrial productivity growth in the industrial districts. These results once again highlight the peculiarity of the relationship between distributive services and the district system.

Also in this case, the coefficients β_1 of the initial level of productivity are statistically significant and negative, confirming the presence of a convergence effect. Industrial districts show a high coefficient β_1 , confirming the presence of a greater convergence effect than other LLSs considered. In the industrial districts, this coefficient shows higher values compared to previously analysed models concerning the growth of the total productivity; these results show a strong tendency towards convergence in the industrial productivity. Similar results regarding the wider issue of convergence of industrial productivity have been discussed in the literature. (Rodrik 2013)

As for the territorial dummies, the results seem to occur only in the districts of Northern Italy, which represent a majority in the total number of districts in the national territory. The Centre of Italy does not show statistically significant results. The explanatory capacity of the model, through its R-squared, is acceptable, and in ID LLSs (0.447) is higher than other LLSs considered.

Table 7 - Distributive services and industrial productivity growth - Model 3

	(Col. 9) ID LLSs	(Col. 10) Man.Non-IDLLSs	(Col. 11) Non-Manuf. LLSs	(Col. 12) Total LLSs
PUL	-0.1189007 (0.0166692)***	-0.0526028 (0.0301536)*	-0.0414389 (0.0103969)***	-0.0545087 (0.0091823)***
WDSB	0.2048559 (0.0788734)***	0.2100666 (0.0844243)**	0.0284222 (0.0390561)	0.0880623 (0.030766)***
WTRA	0.557385 (0.1415045)***	0.0227448 (0.1420596)	-0.1305766 (0.0515109)**	-0.0412278 (0.048524)
WBUS	-0.1114769 (0.0738004)	0.0708011 (0.0840482)	-0.0374177 (0.0477938)	0.0451756 (0.0367326)
WSERNM	-0.1492656 (0.2391783)	-0.2109926 (0.1664101)	-0.0018599 (0.085447)	-0.0289511 (0.0790963)
GDSB	0.3272982 (0.1302895)**	0.1709587 (0.1837827)	0.3899614 (0.1202535)***	0.3001041 (0.0877769)***
GTRA	0.1602759 (0.064389)**	0.0717287 (0.0681803)	0.0497259 (0.0412077)	0.0708374 (0.0332551)**
GBUS	0.0673297 (0.0735555)	0.1152259 (0.1290163)	0.0930124 (0.0571388)	0.1144377 (0.0481699)**
GSERNM	0.0500209 (0.058162)	0.100894 (0.0485212)**	0.0541506 (0.0392124)	0.0656056 (0.0292431)**
North-west	0.0190923 (0.0081228)**	0.0011603 (0.0095645)	-0.0069671 (0.0070668)	-0.0013123 (0.0043346)
North-east	0.0223284 (0.0078553)***	0.013568 (0.0087668)	0.0018696 (0.0064161)	0.0078071 (0.0042)*
Centre	0.0116812 (0.0072922)	-0.0030842 (0.00886)	0.0108358 (0.0056177)*	0.0042879 (0.0039357)
Vif (Mean)	1.97	1.53	1.33	1.53
F stat.	7.97	2.71	4.42	7.86
R-squared	0.4469	0.1833	0.1624	0.1761
no. obs.	156	136	394	686

Source: Own elaboration. Data ISTAT

Note: OLS cross-section regression model. Constant coefficient not shown, although it was included in the model. Corrected standards errors in parentheses. *** Statistical significance level at 1%; ** statistical significance level at 5%; * statistical significance level at 10%.

In all models there are no multicollinearity problems (Vifmean shows a low value) and standards errors are robust to heteroskedasticity. The territorial dualism between Centre-north and south are confirmed by the territorial dummies. These variables show positive and statistically significant coefficients to both in the northern districts and, to a lesser extent, in the districts of the Centre of Italy.

In conclusion, the analysis shows that the distributive services contribute to the productivity growth of the economic system; the expected results therefore are confirmed; the so-called structural burden does not occur because the distributive services show a driving force in the dynamics of the growth. In addition, the results confirm the existence of a strong relation between the distributive services and industrial activities. These virtuous trends seem to advantage particularly the industrial districts. In manufacturing non-ID areas, in fact, these trends do not occur. These results demonstrate that the industrial districts still have an important role in the vitality of the Italian industrial system. It seems that the industrial districts have faced the challenge of modernisation and tertiarisation better in comparison to the rest of the national productive system.

Conclusion

This paper analyses the effects of the increase of the employment share of distributive services, and whether it has a role in explaining total productivity and industrial productivity growth at LLSs level in Italy.

Recent literature has shown that some kinds of services, such as distributive services, can have a positive impact on the dynamic of productivity growth in advanced economies. This framework overturns the traditional view of services as unproductive activities, usually responsible for a structural burden that slows down the evolutionary dynamics of the economic system.

Given the slow pace with which the process of modernisation of services is moving forward, Italy seems to make an important exception to this general conclusion. It should be noted that the studies which in the past approached this problem are usually based on data at a national level. But, due to the coexistence in the Italian economic system of backward and advanced areas, the results achieved can be misleading. Actually, our study shows that conducting the analysis at the LLSs level, it can be seen that industrial districts show a strongly different dynamic when compared to the rest of the productive system.

In fact, two new, main elements emerge from our analysis. In the first place, the preliminary test carried out in the section 3.2 shows that in the industrial districts the growing employment in distributive services does not follow to a weakening of the industrial structure. In fact, it is not related to the loss of employees in industry, and there is rather a positive, synergistic integration between the distributive services and industrial activities. On the contrary, for manufacturing no-ID LLSs there is a negative correlation between the evolution of employment in the distributive services and in the industrial sector.

In the second place, our econometric analysis proves that the increase in the employment share of distributive services influences both the total and the industrial productivity growth. The conclusions, in this case, are quite clear: on the one hand, it can be said that in the industrial districts the so-called structural burden seems not to be at work; on the other hand, a positive integration between distributive services and industrial activities seems to be operating. These results are even more interesting when compared to the rest of the production system. Manufacturing non-ID LLSs, indeed, do not obtain analogous results. In other words, industrial districts show a peculiar trend and seem to implement, better than the other areas, the opportunities arising from structural change.

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