Performance of Italian firms and Local Dynamics

Stefania Cardinaleschi [1], Stefano De Santis[2] , Francesco Giovanni Truglia[3] Marina Schenkel [4]

1. Introduction

The global integration of the real and financial markets, the completion of the European Single Market and the introduction of the euro, the reorganization of global value chains resulted in two possible consequences for the Italian productive system: the loss of the local identity, and the negative effects on employment, income and growth resulting from the deterioration of the interfirm relations typical of industrial districts.

The "industrial commons" or the "industrial atmosphere", built during the long term growth process, had to face the challenges arising from relocation/internationalization. In some cases the heterogeneity of firms has made the territorial aspects of the ongoing processes almost unrecognizable. In others, the territory of origin has lost its meaning in front of the reorganization of production and the expansion of networks to whom the individual firms participate. Sometimes the sunset of the old winning models also implies the decline of the firms that generated them. Elsewhere the firm's uniqueness in the heterogeneity of the industrial environment allows the permanence of the levels of welfare and development achieved in the past.

Some recent studies point to a decrease (Di Giacinto et al., 2014) or the disappearance (De Marchi and Grandinetti, 2014) of the positive effect of being located in a district upon firm performance.

In the present study various techniques are applied to individual firm data to explain the enterprises performance, taking account of spillovers between contiguous areas and examining the dynamics of Local Labour Systems and Industrial Districts.

The goal of the analysis is to verify if the performance of each Local Labour System/firm depends on the neighbouring areas' one.

2. Background

Since the early '90s, it has been possible to examine enterprises profitability on the basis of longitudinal data. It became apparent that profits were persistently heterogeneous, and their level was systematically higher than the one which should be realized in competitive markets (Bartelsmann, 2000).

This would not be directly explainable if low performance firms were eliminated from the market selection mechanisms. However a variety of theoretical approaches, from those of classical inspiration, as the

[1] Istat, V. Balbo, Roma, Cardinal@istat.it (corresponding author)

[2] Istat, V. Balbo, Roma, sdesantis@istat.it

[3] Istat, V. Balbo, Roma, Truglia@istat.it

[4] Cannaregio 2251, 30121 Venezia, Schenkel@uniud.it

productivity function of Sylos Labini (1984), to more complex selection models, which originate from the work of Alchian (1950), or, more recently, adherent to the evolutionary theory of firm (Dosi and Grazzi, 2006; Dosi, 2008, Dosi et al. 2011), allow to analyze the factors that determine firm success over time, and the survival of those who constantlly underperform in comparison with others (Barba Navaretti et al., 2007; Oropallo and Rossetti, 2007 Arrighetti and Traù, 2012, Traù, 2013). It should also be stressed that the same levels of performance are compatible with significant and persistent differences in many characteristics, as company size, location, turnover, productivity, internationalization, level of investment, Research and Development, etc.

The most common indicator of enterprise performance is the level of productivity, which allows to charge lower prices and achieve higher profits, and therefore have a greater capacity of financing tangible and intangible investments, in particular in R and D.

Moreover, in the presence of fixed costs of entry into foreign markets, productivity differentials can explain the self-selection of firms in export markets. Therefore the most productive firms show a greater propensity for internationalization (Melitz, 2003; Melitz and Ottaviano, 2008).

The use of performance measures (such as EBITDA, gross profits, ROI or ROE) can be criticized for the lack of correspondence with the theoretical variable that should be considered (Mueller, 1990). However, also productivity may reflect, rather than efficiency, the market power of companies, that is the ability to impose higher prices due to the lack of competition (Syverson, 2010).

Many analysis of the Italian case take into account various indicators of firm performance, as exports (Barba Navaretti et al., 2007; Guelpa et al., 2007), productivity growth (Dosi et al., 2011), turnover and number of hours worked (Accetturo et al., 2011). As far as size is concerned, it seems that small and medium-sized firms (10-250 employees) get a better result than the micro and large ones, according to studies conducted at the national level (Monducci et al., 2010) . However, in foreign markets most firms are of a larger size (Brandolini and Bugamelli, 2009).

Empirical results don't confirm the link between productivity and growth, which the theory would predict. Although in larger companies added value per employee is consistently greater (Monducci et al., 2010; Istat, 2010). However the stagnation of productivity is similar both in large and small Italian firms (Dosi et al., 2011).

The analyses that take into account the relationship between profits and productivity (Dosi, 2008; Secchi and Tamagni, 2009; Bottazzi et al. 2010, Dosi et al., 2011, Schenkel and Cassetta, 2014) confirm the positive link between productivity and profits, but not the one between these variables and the firm's growth. In addition it has been found that the influence of labor costs is always negative (Schenkel and Cassetta, 2014). As for the main "strategic" variables (such as investment, internationalization, vertical integration) the results depend from the measure of profitability and the estimation methods chosen.

3. Data and descriptive statistics

A data-base was created for the purpose of this research, matching various administrative and statistical sources. The firm budget data collected by the Chamber of Commerce and the Statistical Archive of Active Enterprises Data (Archivio Statistico delle Imprese Attive - ASIA) were used. The 2004-2011 period is included, allowing to map the firms characteristics over a period centered around the beginning of the crisis in 2008. The units of analysis are the companies subject to budget requirement, organized in the form of non-balanced panel.

The data set includes approximately 1,166,129 companies in the period between 2004 and 2011. Although these companies represent the 15.6% of all enterprises, in 2012 they constitute the largest segment of the Italian economy in terms of turnover (61.1%), value added (55.3%), MOL (43, 2%), employment (60.7%). The creation of the database has involved a complex work of harmonization of the sources, due to:

- the diversity of data structures over time, related to changes in data collection procedures in different years by the Chambers of Commerce
- the territorial changes over time
- the transcoding resulting from changes in the classification of ISTAT territorial unit (detail level NUTS 5) and the transition from the Ateco 2002 to Ateco 2007.

The data have been aggregated on the basis of Labor Local Systems (SLL) that constitute the unit of analysis of this research. The firms in the sample have a turnover and average active respectively equal to 11.48 and 11.74 millions. The corresponding values for micro-enterprises are much smaller (600,000 and 800,000 euro). The average age of the firms, even micro-enterprises, is rather high.

4. Spatial analysis: methodology and first results

The methodology adopted refers to econometric analysis developed by Anselin (1988, 1990, 2002), and falls within the Exploratory Spatial Data Analysis (ESDA) and the Exploratory Space-Time Data Analysis (ESTDA) of Chasco and Lopez (2004, 2006, 2007). This approach allows to assess the contemporary and lagged dependence jointly, identifying spillovers and spinoffs that determine the spatio-temporal dynamics. Föllmer identifies two elements that characterize the spatial interaction: the stochastic feature of the agents' preferences (in our case the agents are the firms located in different Labour Systems); ii) the relationship between agents, which varies depending on their proximity. In this case proximity is in geographical terms. Proximity is expressed in the neighborhood structure. The first variable which has been taken under consideration is ROI_{ti} where t = time (2004-2011) and i =municipality (territorial base 2011).

The procedure has involved 4 steps.

1. ROI_{ti} has been recoded in binary form:

$$ROI_{yi} = \begin{cases} \geq 1 \rightarrow y_{ti} = 1 \\ < 1 \rightarrow y_{ti} = 0 \end{cases} \qquad [1]$$

2. The elements w_{ij} of the spatial contiguity matrix W (which can be calculated for different orders or spatial lags) have been coded in the following way (Neighbourhood Spatial Structure):

$$w_{ij} = \begin{cases} 1 \rightarrow \text{if the } i \text{ municipality is contiguous to the } j \text{ municipality} \\ 0 \rightarrow \text{otherwise} \end{cases} \qquad [2].$$

3. The matrix W has been multiplied for the 2011 recoded ROI (y_{11i}). Denoting by J_i the set of Local Labor Systems contiguous to ith municipality, and $w_{ij} * y_{11ij}$ the indicator variable v_i is called Spatially legend, while $L^s y = w_{ij} y_{ij}$ is the spatial lag.

$$v_i = \sum_{j \in J} w_{ij}\, y_{11\text{ij}} \qquad [3]$$

5. The logistic model

$$p(y_{11i} = 1) = \frac{e^{B_0 + B_1 V_{11i} + B_2 D_i}}{1 + e^{B_0 + B_1 V_{11i} + B_2 D_i}} \qquad [4]$$

was estimated.

The result of the Spatial analysis on ROI has been that the temporal effects are greater than the spatial ones. Moreover the spatial effects are greater when ROI is positive. The model classifies a large percentage of municipalities (around the 83% of cases) "correctly". Furthermore, the ability to correctly discriminate is larger for "successful" municipalities, that is, with ROI ≥ 0. Industrial districts largely reproduce the clusters identified in the analysis, especially in the municipalities where firms have a better performance and,

conversely, the district municipalities belong largely to the most successful clusters (Cardinaleschi et al., 2016).

6. Further developments of the research

A Principal Components Analysis was carried on. Subsequently the spatial analysis was applied again on the outputs of PCA, in order to investigate the effect of the firms' performance on the overall income level, together with the effect, in the longer term, of other geographical and institutional variables. The results are shown in the following two paragraphs.

6.1. Multidimensional analysis of Budget data

The availability of Budget data, arranged in the database described in Section 3, has led to an evolution of the analytical framework, in order to exploit the information potential.

The factorial technique which was chosen is the Principal Components Analysis (PCA), carried out simultaneously on the dual variables space, as on that of the unit. Each of the Local Labour Systems, as a point-unit, has a score on each of the multidimensional ratings (synthetic indices). By the positions taken by the SLL on the various multidimensional charts it has been possible to get information on the various aspects of the complex phenomenon.

These indices are unrelated either linearly, or with higher polynomial functions, even when linked by mathematical formulas (such as ROI and ROE)

The average value of the correlation (absolute values) of the 11 indices calculated has shown a very low value ($r = 0.12$), indicating that the phenomenon is determined by different underlying trends.

The different from zero eigenvalues were 11, of which only 4 had an absolute value greater than 1, and therefore were natural candidates for a possible interpretation. The first eigenvalue was worth about 3.48 and was equal to 31.68% of the trace of the diagonalized matrix, while the second explains a further 16.85%. Since each factor space consisted of orthogonal, and thus additive, components, the first factorial plan has reproduced the 48,53% of the linear variation of the phenomenon. The explained variance was not very high, since various strong latent structures constitute the basic trends of the phenomenon, even with a low number of variables.

In the factorial plane, the first factor was interpreted as the "industrial" Efficiency, given the strong correlations and the quality of the representation of virtually all the variables: gross profitability (EBITDA/VA), return on investments (ROI), productivity per employee and also average labor cost per employee. The latter relationship has been always confirmed by the data, and can be interpreted in two ways: in production processes with high value added margins exist to generously remunerate the labor factor. Alternatively, to achieve a high productivity it is necessary to have - and pay for - high-level skills. These firms tend to be the most "senior". Consistently with these results, at the other polarity of the axis capital elasticity indicator is found, since the less productive firms are characterized generally by a lower endowment of capital per worker (whereby the ratio Current Assets / Fixed Assets turns out to be higher), as well as the solvency indicator, because high values indicate the presence of passive positions larger than the company's gross profitability.

The second factor is interpreted as the net profitability, in terms of financial return. The variables that characterize the Modigliani-Miller formula, ie ROE on one side, ROD and Leverage on the other, are in fact opposed on the axis.

7. Spatial analysis

The two factorial dimensions identified by the PCA for the years 2004-2011 have been used as variables of the spatial regression model described in the following section, in order to identify whether and to what extent the spatial, i.e. the proximity/distance of the territorial units (SLL), and the temporal aspects influence the dynamics of the first two factorial dimensions.

7.1. Spatial-Lag Model

The model has been again part of the theoretical and methodological apparatus developed by Anselin (1980, 1988, 1994, 2002) and, in its general form can be written thus:

[1] $$\rho\, y\, W_1 + X\beta + \varepsilon$$

[2] $$\lambda W\, \varepsilon = \varepsilon_2 + u$$

where:

- y is the vector *N* x1 of the observations of the dependent variable *(N* is the number of geographic units);
- W_1 W_2 are *N* x *N* matrices of contiguity attached to the lagged variables and disturbance;
- X is a matrix *N* x *k* of observations of the explanatory variables;
- ρ and λ are the two autoregression coefficients (scalar), respectively associated with the lagged variable Wy and noise factor ε;
- β are *k* x 1 vectors of the regression and autoregression parameters respectively associated with the explanatory variables X;
- u is the error term and is normally distributed with mean 0 and covariance diagonal matrix Ω.

Since in the general model there are three autoregressive terms ($\rho W_1 y$, δW_{1X} and $\lambda W_2 \varepsilon$), the use of the least squares estimation method (*OLS*) produces biased and inconsistent estimates. Therefore maximum likelihood (*ML*) method was applied.

Starting from the general model and setting:

- δ , $\lambda = 0$ the Spatial Lag model was obtained .

[3] $$y = \rho\, W_1\, X\, y + \beta + \varepsilon$$

- δ , $\rho = 0$ the Spatial Error model was obtained .

[4] $$y = X\beta + (I - \lambda W_2)^{-1} u$$

The spatial dependence takes different meanings depending on the model (Doreian, 1980). In fact, the control parameter ρ of the Spatial Lag model records the relationship between territorial units through the dependent variable, while the parameter λ of the Spatial Error model records the joint effect, in addition to the spatial configuration of the unit, of the variables not included in the model. Finally, Durbin has shown that the Spatial Error model can be formulated in terms of the Spatial Lag model which includes, in addition to the dependent variable lags, also that of the explanatory variables, and can be written (Anselin, 2002) as:

[5] $$y = \rho W_2 y + X\beta - \delta W_2 X + u$$

The Durbin model incorporates the spatial lag in both the dependent and explanatory variables. The first records the spillover effect due to the values that y assumes in contiguous units. The second records the spinoffs that can be ascribed to the values taken the explanatory variables in the nearby areas.

7.2. Identification and estimation of the model

To evaluate the space-time effects at the Local Labour System level the following model has been used:

$$A1\_11 = \rho WA1\_11 + B_1 A1\_10 + B_2 A1\_09 + B_1 A1\_08 + \varepsilon \quad [7]$$

Where:

- WA1_11 the first lagged factorial component in space;
- A1_11 identifies the first PCA factorial component in the year 2011;A1_10, A1_09 and A1_08 the first component in the years 2008-2010.

For the other years the parameters were not significant.

The correct specification of the model was confirmed by the relationship between the Word statistics (Wd), the Likelihood Ratio (LR) and the Lagrange Multipler (LM), that assume the following values respectively:

$$W = 55.2049 > LR = 52.45 > LM = 52.02$$

The spatial component that records the spillover effect was significant, as the first factorial component for the years 2010, 2009 and 2008. Among these the largest weight was that of 2010.

Overall, the spatial analysis results, performed on the first identified component "Efficiency", has confirmed and strengthened those of the analysis on the ROI of municipalities (Sections 6 and 7), in comparison with which the spatial effects have been also more significant. These effects however were not significant on the second component, the overall Profitability, on which the changing financial conditions exert the greater influence.

The predicted values are represented in the figure below, where the highly dynamic areas are in red (i.e. the areas characterized by positive values both in their own history and in nearby areas), the low dynamic areas (specular to the previous one, i.e. characterized by negative values both in their own and neighboring areas) in blue, the disruption areas (high-low and low-high) in pink and pale blue, and finally not characterized areas in gray.

Figure 6 - Map of predicted values

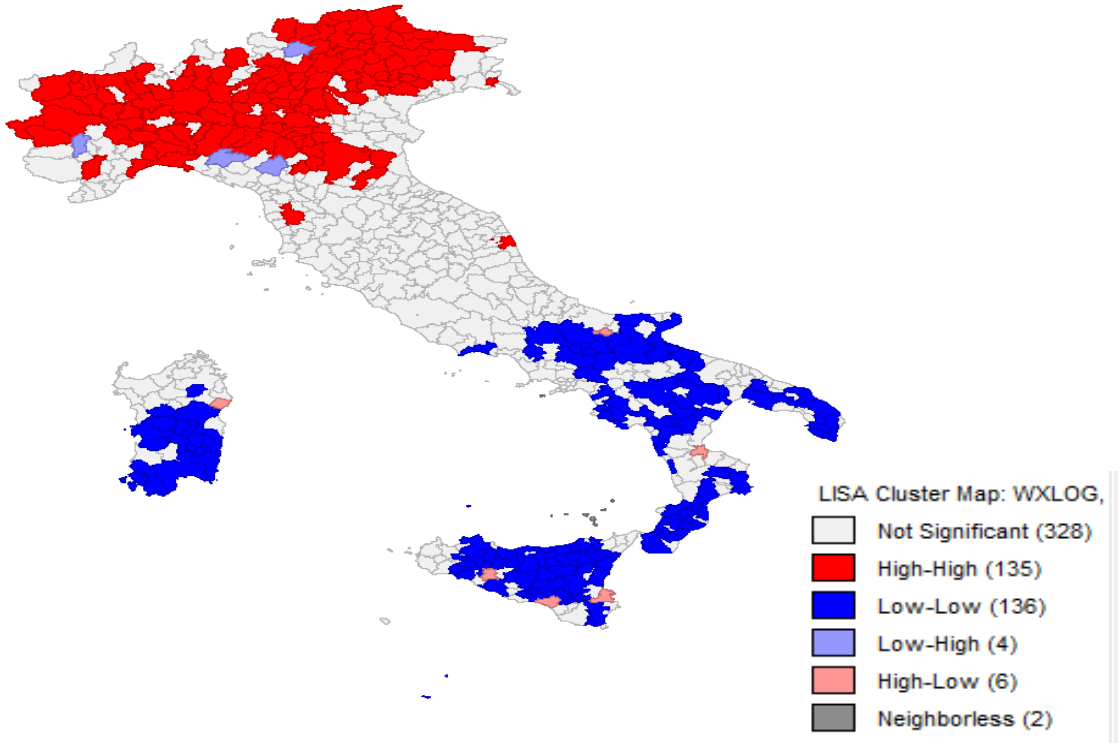


Table 6 - Comparison between Local Labour Systems (LLS) and Clusters

Clusters: descriptive statistics

Specializzation	high-high	high-low	low-high	low-low	no neighb	not significative	Total
No specialization	81	6	4	134	2	243	470
Mechanical Industry	23	0	0	0	0	15	38
Household goods	9	0	0	0	0	15	24
Textile and clothes	6	0	0	4	0	22	32
Metal Industry	3	0	0	0	0	1	4
Food Industries	2	0	0	2	0	11	15
Leather Goods	2	0	0	1	0	14	17
Chemicals and Oil	1	0	0	0	0	4	5
Instruments and jewelllery	1	0	0	0	0	3	4
Paper Industries	0	0	0	0	0	2	2
Total	128	6	4	141	2	330	611

moran	N. of SLL	VA per worker	Labour cost per worker	VA / MOL	ROI	ROE	ROD	Leverage	Patrim. soundness	Patrim. Elasticity	Substainability Index	Firm age
high-high	128	€ 55.966	€ 37.894	35,49%	2,98%	1,59%	1,93%	3,26	32,1%	1,37	4,50	14,80
not significative	330	€ 42.037	€ 31.311	31,16%	2,09%	4,28%	2,01%	3,77	26,0%	1,50	7,04	11,69
low-low	141	€ 33.216	€ 25.495	28,87%	1,80%	-6,92%	1,83%	5,25	21,8%	1,85	8,13	9,77
Total	599	€ 42.937	€ 31.349	31,55%	2,21%	1,07%	1,95%	4,01	26,3%	1,56	6,75	11,90

	moran	Numero SLL	VA per addetto	costo del lavoro per addetto	VA / MOL	ROI	ROE	ROD	Leverage	Solidità patrimoniale	Elasticità patrimoniale	Indice di sostenibilità	Età dell'impresa
Distretti Industriali	high-high	47	€ 53.795	€ 38.261	33,29%	2,62%	1,43%	1,85%	3,23	31,0%	1,57	4,25	14,2
	not significative	87	€ 45.868	€ 33.572	32,93%	2,57%	1,10%	2,03%	3,58	28,0%	1,57	4,84	12,66
	low-low	7	€ 32.493	€ 25.114	30,53%	2,39%	1,13%	1,66%	4,88	20,5%	1,94	6,10	9,7
NO Distretti Industriali	high-high	81	€ 53.835	€ 37.609	34,61%	2,96%	2,74%	1,91%	3,12	32,0%	1,27	4,11	14,3
	no significative	243	€ 39.220	€ 30.275	31,24%	2,11%	-0,35%	1,96%	4,02	24,8%	1,41	6,06	10,98
	low-low	134	€ 32.945	€ 25.550	29,43%	1,96%	0,13%	1,82%	4,57	21,9%	1,64	6,23	9,7

Istat

The comparison between LLS and the clusters identified by the model shows that among specialized areas (industrial districts), the most dynamic areas belong to the "Made in Italy" sector, and, in particular, to the mechanical and to the household goods industries.

Different areas (by exclusion of the few disrupture areas) have values of the various indexes near to the expected ones. In particular the positive areas (high-high) have higher values of value added per employee and consequently higher wages, greater fixed capital/Labour ratios; higher EBITDA and ROI, greater financial strength; higher average age. Distinguishing among the LLS which are industrial districts and the others, average values are identical, and in fact even the difference of means test leads to accept the null hypothesis of equality, in classified areas (high-high and low-low). Among the non-classified clusters, the industrial districts, territorially concentrated areas, with strong industrial vocation, are significantly stronger than the others, while presenting appreciable differences in comparison with the High-High areas.

This analysis has confirmed the industrial districts' vitality: industrial districts represent the 37% of high-high areas (47 of 128), while the 87 districts not classified by the model have a significantly better performance than unspecialized areas, and the total (all Italian areas).

Even if the variables included, as well as the spatial aggregation criterion, have been different between the first model (Municipalities' ROI) and the second one (Local Labour System index of performance), the same core areas emerge.

Summing up the results:

- The time effects predominate over the spatial ones
- However, the spatial effects are significant, especially for areas with better/worse performance

- Districts reproduce the clusters identified in the analysis, and industrial district areas represent about 45% of the most successful clusters.
- To be a district does not discriminate between High-High and Low-Low LLS, but instead discriminate between unclustered LLS.

Both orders of considerations strongly support a postponement of the *De Profundis* expressed by several parties with respect to the vitality of the Italian industrial districts. As mentioned earlier, the industrial vocation and the presence of competitive advantages in location still play a major role in our country's present and future.

It has to be stressed that the period taken into consideration allows to take into account the effects of the Great Recession on the Italian industrial system. On the top of that, the number of firms under consideration gives strength to the above results.

The spatial analysis seems indeed to reinforce the view that the fragmentation of supply and distribution chains have not yet eliminated the positive legacy on the firms productivity and profitability of the industrial districts formation and consolidation. These effects' importance grows when the firms efficiency, net of the influence of the financial conditions, is analyzed.

8. Last developments of the analysis

On the basis of Industrial Census data, a further analysis has been conducted on the characteristic of the clusters identified by the preceding research. The dependent variable is the Efficiency index, as constructed through the Multiway Analisis descripted in Section 6.1. A regression is made first on the whole sample, and then separately on each type of cluster identified by the spatial analysis in section 6.2.

The explanatory variables included represent the main strategic choices made by the firms, i.e. the percentage of sales exported (Exp. Fat.) and the prevailing sales market (Mkt), the enrollment of skilled personnnel (Skills), the introduction various types of innovation (Process inn., Product inn., Organizational inn, Marketing inn.), together with some structural statistics, as size (Clad), macrosector (Macro), Macroregion (rip).
In the following tables (Tabb. 7, 8 and 9), some descriptive statistics and the results of the regression analysis are shown.
Some interesting hypothesis emerge from the comparison of the frequency of the various strategies of enterprises in different types of clusters (Tab. 7). Innovation and skilled labour enrollment are definitely more often adopted in the firms belonging to the High-High LLS (and conversely in very few firms in Low-Low LLS). The same is not true for exports, since the greatest demand comes from the domestic market, as far as High-High LLS are concerned. The exporting areas are to be found mainly among the unclassified ones, above all if they are Industrial Districts (No Signal-ID), while local market is prevailing for Low-Low LLS. It seems that the most prosperous areas enjoy of better opportunities in the domestic, rather than in the European market, while global market is not prevailing for any type of LLS.

Tab. 7. Census data and clusters: descriptive Statistics

Census data and clusters: Descriptive Statistics

CLUSTER	export_	Skills	mkt	Process inn.	Prod inn..	Org. inn	Mark inn
High-High	12,18	46,63	Italia	0,23	0,28	0,28	0,24
Nosignal-ID	14,67	34,17	UE	0,23	0,27	0,26	0,23
Nosignal-NoID	5,61	38,93	Italia	0,18	0,20	0,24	0,19
Low-Low	2,86	32,49	Regione	0,16	0,16	0,23	0,17
Total	9,80	41,42	Italia	0,21	0,25	0,26	0,22

Istat

The results of the regression analysis on the whole sample are presented in the following table (Tab. 8). The positive effect on Efficiency of various types of Innovation and of hiring skilled personnel is apparent. As far as export activity is concerned, a small positive effect is emerging, together with a strong positive effect of exporting in European and extra European markets. The coefficients of structural characteristics are more predictable, since size is positively connected with efficiency, as well as sectorial (Industry and Advanced Tertiary) and regional (North-Center) features. Hopefully, the coefficient of the location in a High-High area is strongly positive, followed by the others in decreasing order of efficiency.

Tab. 8. Census data and clusters Dependent Variable: Efficiency

Census data and clusters: Dep. Variable Efficiency

VARIABLES	β
Low-Low	-0,076***
Nosign - ID	-0,014*
Nosign - noID	-0,038***
innproc	0,129***
innprod	0,074***
innorg	0,073***
innmark	0,032***
hisk	0,14***
exp_fatt	0,001***
Europa, mkt	0,223***
Extra-Europa, mkt	0,263***
2,clad	1,388***
3,clad	2,726***
4,clad	4,376***
2,macro	0,051***
3,macro	0,446***
4,macro	-0,44***
2,rip	-0,131***
3,rip	0,062***
4,rip	0,065***
5,rip	-0,13***
_cons	13,063***

Istat

These results are substantially confirmed employing the same variables separately for each type of LLS (table 9), except that Product innovation and Exports have no effect on Low-Low firms efficiency, nor Marketing innovation on No-signal, No-District firms efficiency. Moreover some differences appear among the influence of firms regional location.

Moreover, the following "capital activation" indexes has be constructed 1)investments/capital; 2) investments/profits, with various specifications. Also from this point of view the homogeneous aereas identified by the spatial analysis (correctly) predict that in Industrial Districts the investment propensity is higher.

Tab. 9: Census data in different type of clusters: Dep. Variable Efficiency

Census data and clusters: Dep. Variable Efficiencyy

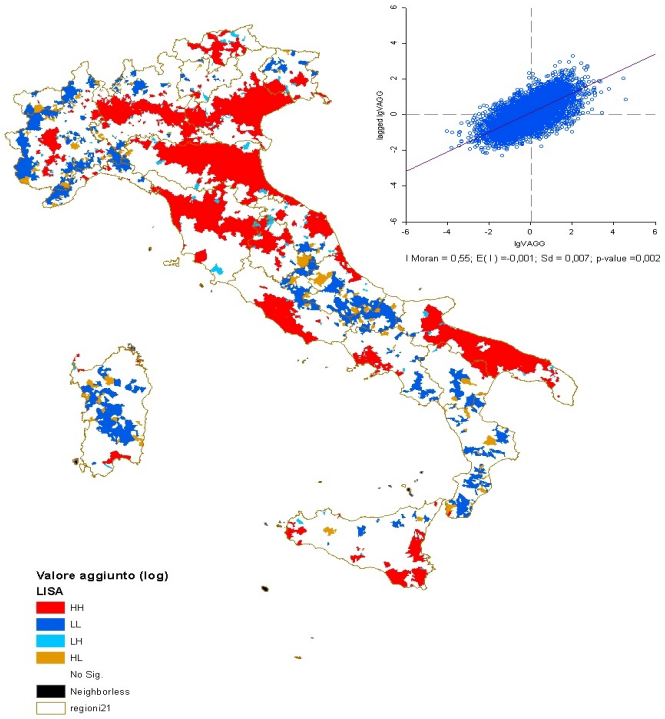
VARIABLES	High-High	Low-Low	Nosign - ID	Nosign - no ID
innproc	0,129***	0,153***	0,134***	0,123***
innprod	0,078***	0,01	0,084***	0,072***
innorg	0,077***	0,062**	0,058***	0,078***
innmark	0,042***	0,063**	0,00	0,030**
hisk	0,160***	0,143***	0,096***	0,139***
exp_fatt	0,00114***	0,00	0,00236***	0,00135***
Europa,mkt	0,209***	0,260***	0,223***	0,247***
extra-Europa,mkt	0,257***	0,257***	0,266***	0,280***
2,clad	1,353***	1,456***	1,375***	1,417***
3,clad	2,685***	2,790***	2,742***	2,753***
4,clad	4,338***	4,483***	4,291***	4,441***
2,macro	0,051***	0,127***	0,076***	0,039**
3,macro	0,372***	0,678***	0,424***	0,515***
4,macro	-0,428***	-0,434***	-0,486***	-0,437***
3,rip	0,104***		0,068***	0,049***
4,rip	0,108***		0,04	0,038**
2,rip		-0,06	-0,372***	-0,193***
5,rip		-0,099*	-0,144***	-0,125***
_cons	13,049***	12,825***	13,101***	12,990***

Istat

	INVESTIMENTI su TOTALE ATTIVO	INVESTIMENTI su Patrimonio	INVESTIMENTI su RISULTATO ANTE IMPOSTE	INVESTIME UTILE NETT
igh-High	1,76	4,76	81,32	1,98
osignal-ID	1,9	5,78	96,8	3,21
osignal-NoID	1,44	4,75	120,8	10,4
ow-Low	-30,15	-113,58	-5299,23	70,07
otale	0,32	0,94	17,95	0,56

The next step of the analysis of Local Dynamics has been directed to investigate the firms performance on the Big Data data bases, constructed putting together data from administrative sources, web services and statistical surveys (statistical matching), and using geolocalisaton tecchniques.
The first results on the clusterization of individual firms productivity seem to confirm the preceding ones.

Geolocalizzazione: definizione dei cluster



9. Bibliography

1. Accetturo A., Giunta A., Rossi S. (2011), Le imprese italiana tra crisi e nuova globalizzazione, *l'Industria. Rivista di Economia e Politica Industriale*, XXXII, 1: 145-164.

2. Accetturo A. et al (2015). Deindustrializzazione e terziarizzazione: trasformazioni strutturali nelle regioni del Nord Ovest, Banca d'Italia, Temi di discussion

3. Alchian A.A. (1950), Uncertainty, Evolution and Economic Theory, *Journal of Political Economy*, 58: 211–221.

4. Anselin L. (1980), Estimation Methods for Spatial Autoregressive Structures. New York:, Cornell University. *Regional Science Dissertation and Monograph*, n. 8.

5. Anselin L.(1986), Some Further Notes on Spatial models and Regional Science, *Journal of Regional Science*: 799-802.

6. Anselin L.(1988), *Spatial econometrics. models and applications*, Kluwer-Dodrecht.

7. Anselin L.(1994), Local Indicator of spatial association–LISA. WestVirginia University Regional Research Institute.

8. Anselin L.(2002), *Under the Hood. Issues in the Specification and Interpretation of Spatial Regression Models*, Regional Economics Application Laboratory (REAL),University of Illinois.

9. Arrighetti A., Traù F.(2012), Far from the madding crowd. Sviluppo delle competenze e nuovi percorsi evolutivi delle imprese italiane, *l'Industria. Rivista di Economia e Politica Industriale*, XXXIII, 1: 7-59.

10. Atzeni S., Dettori B., Usai S. (2004) «Econometria per le indagini territoriali», Cagliari: CRENoS – Altantis. *Quaderni di Lavoro*, N.1.

11. Barba Navaretti G., Bugamelli M., Faini R., Schivardi F., Tucci A. (2007) Le imprese e la specializzazione produttiva dell'Italia. Dal macrodeclino alla microcrescita?. Rapporto preparato per conto della Fondazione Rodolfo Debenedetti per il Convegno: I vantaggi dell'Italia, Roma 22 marzo.

12. Bartelsman E. J., Domas M. (2000), Understanding Productivity; Lessons from Longitudinal Microdata, *Journal of Economic Literature*, 38: 569-594.

13. Bottazzi G., Dosi G., Jacoby N., Secchi A. Tamagni F. (2010), Corporate performances and market selection: some comparative evidence, *Industrial and Corporate Change*, 19: 1953-1996.

14. Brandolini A., Bugamelli M. (a cura di) (2009), Rapporto sulle tendenze del sistema produttivo italiano. Roma: Banca d'Italia *Questioni di Economia e Finanza (Occasional papers)*, N. 45.

15. Cardinaleschi S., De Santis S., Schenkel M., Truglia F.G. (2016) Performance delle imprese e effetti spaziali, *Eyesreg*, 6, N. 4.

16. Causo S., S. Costa, F. Luchetti, R. Monducci and S. Rossetti (2014) "L'internazionalizzazione delle imprese manifatturiere italiane durante la crisi: vincitori e vinti nel mercato globale". *L'Industria - Rivista di Economia e Politica Industriale*. 1:3-28.

17. De Marchi V., Grandinetti. R. (2014) Industrial Districts and the Collapse of The Marshallian Model: Looking at the Italian Experience, *Competition and Change*, 18: 70–87.

18. Di Giacinto V., Gomellini M., Micucci G., Pagnin M. (2014), Mapping local productivity advantages in Italy: industrial districts, cities or both?, *Journal of Economic Geography* 14: 365–394.

19. Doreian P.(1980), Linear Model with Spatially Distributed Data. Spatial Disturbance or Spatial Effects, *Sociological Methods & Research*, 9, 1, :29-60.

20. Dosi G. (2008) Regolarità statistiche nell'evoluzione dei settori industriali: l'evidenza empirica e le sfide per la teoria *l'Industria. Rivista di Economia e Politica Industriale*, XXIX: 185-219.

21. Dosi G., Grazzi M. (2006) Technologies as problem-solving procedures and technologies as input-output relations: some perspectives on the theory of production, *Industrial and Corporate Change*, 15: 73-102.

22. Dosi G., Grazzi M., Tomasi C. Zeli A. (2011), L'industria manifatturiera negli ultimi due decenni prima della crisi: le micro-dinamiche sottostanti ai trend aggregati *Economia e Politica Industriale*, 38: 63-95.

23. Foresti G., Guelpa F., Trenti F. (2008), I distretti industriali alla prova della palingenesi. *l'Industria Rivista di economia e politica industriale*, XXIX, 3: 547-570.

24. Istat (2010) *Rapporto Annuale 2009. La situazione economica del paese*, Roma: Istat.

25. Melitz M. J. (2003) The Impact of Trade on Intra-Industry Reallocations and Agggregate Industry Productivity, *Econometrica*, 71: 1695-1725.

26. Melitz M. J., Ottaviano J.I.P. (2008), Market Size, Trade, and Productivity *Review of Economic Studies*, 75: 295-316.

27. Monducci R., Anitori P., Oropallo F. Pascucci C. (2010), Crisi e ripresa del sistema industriale italiano: tendenze aggregate ed eterogeneità delle imprese, *Economia e Politica Industriale*, 37: 93-116.

28. Mueller D. C. 1990. The Dynamics of Company Profits. Cambridge: Cambridge University Press.

29. Oropallo F., Rossetti S. (2007) Entrepreneurs' Behaviour and performance: An Empirical Analysis on Italian Firms, *Rivista di Politica Economica*, 97: 1-18.

30. Schenkel M. Cassetta E. (2014), La performance delle piccole e medie imprese italiane: un'analisi empirica, *Rivista di Statistica Ufficiale*, 3: 21-41.

31. Secchi A. Tamagni F. (2009) Un'analisi empirica delle relazioni tra crescita d'impresa, produttività e profittabilità, in Rondi L., Silva F. (a cura di) *Produttività e cambiamento nell'industria italiana. Indagini quantitative*,Bologna: Il Mulino. 39-65.

32. Sylos Labini P. (1984) *Le forze dello sviluppo e del declino*, Bari-Roma: Laterza.

33. Syverson C. (2010) What determines productivity? *NBER Working Paper*, No. 15712.

34. Traù F. (2013), L'eterogeneità dei risultati economici delle imprese negli anni della globalizzazione e della crisi, *QA-Rivista dell'Associazione Rossi-Doria*: 7-42.