

Innovation in industrial districts: Evidence from Italy*

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Abstract

The aim of this paper is to show that Italian manufacturing firms belonging to Marshallian industrial districts carry out a higher innovative effort than is usually acknowledged. This intentional innovative effort, together with the positive 'Marshallian' externalities, makes it possible to reach a high performance in terms of productivity, which in turn makes it possible to compete in international markets in which low-labour-cost countries tend to specialize in mature products.

Our view is supported by both a descriptive and econometric analysis which makes use of a new and original data-set which integrates three different statistical sources, namely the Community Innovation Survey (CIS), the Italian Structural Business Statistics (SCI) and the Italian Business Register (ASIA).

The empirical analysis uses a panel of 1,218 district and non-district firms belonging to traditional sectors. Data refers to 1992 and 1995.

In order to test our basic hypothesis we have estimated an augmented Cobb-Douglas production function. The estimation of this equation makes it possible to empirically identify three different determinants of firms' productivity: (i) the intentional innovative activity; (ii) the 'district effect', that is the (positive) effect due to belonging to a district; and finally (iii) the joint district and innovation effect. Our empirical results show that firms' membership in industrial districts and product innovations are key factors in explaining productivity of firms working in the Italian traditional sectors. Finally, we detect significant interaction effects between these two factors.

December 2003

* This paper was developed as part of the National Research Programme (PRIN) 'Infrastructures, competitiveness and subsidiarity' sponsored by the Italian Ministry for Education, University and Research (MIUR), co-ordinated by the University of Ferrara.

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1. Introduction

The Italian manufacturing industry is characterized by a widely known positive ‘anomaly’: namely, a system made up of a large number of small-sized firms, many of which are concentrated in bounded geographical areas. These local systems of small-sized firms have been named Marshallian industrial districts (Brusco, 1982; Becattini, 1989). Scholars such as Becattini, Brusco and others have highlighted the basic features of this form of industrial organization: (i) district firms are often specialized in traditional sectors such as textile, leather, footwear, wood, and so on (Brusco *et al.*, 1996); (ii) district firms tend to be rather small; (iii) district firms are localized in a bounded geographical area – generally composed of five or six municipalities; (iv) the physical proximity between firms engenders positive spillovers which concern the diffusion of information, knowledge and ideas – also because of skilled workers moving from one firm to another; (v) the role played by intentional innovative effort is very limited. The latter feature has led to the idea that industrial districts are technologically laggard and suffer disadvantages in generating innovation.

The aim of this paper is to show that Italian manufacturing firms belonging to Marshallian industrial districts carry out a higher intentional innovative effort than is usually acknowledged. This intentional innovative effort takes the form of product innovation which, together with the positive ‘Marshallian’ externalities, makes it possible to reach a high performance in terms of productivity, which in turn makes it possible to compete in international markets in which low-labour-cost countries tend to specialize in mature products. Product innovation – a form of innovation which can only be intentional – deserves particular attention, as it has been one of the key features which have characterized Italian districts’ capability of survival.

Our view is supported by both a descriptive and econometric analysis which makes use of a new and original data-set. In fact, this data-set refers to information at the firm level built up by integrating three different statistical sources, namely the Community Innovation Survey (CIS), the Italian Structural Business Statistics (SCI) and the Italian Business Register (ASIA).

The empirical analysis makes use of a panel of 1,218 district and non-district firms belonging to traditional sectors. Data refers to the years 1992 and 1995.

In order to test our basic hypothesis we have estimated an augmented Cobb-Douglas production function. The estimation of this equation makes it possible to empirically identify three different determinants of firms' productivity: (i) the intentional innovative activity; (ii) the 'district effect', that is the (positive) effect due to belonging to a district; and finally (iii) the joint district and innovation effect which may be interpreted – according to our theoretical setting – as a sort of complementarity between codified and tacit knowledge.

This paper is organized as follows. Section 2 analyses some theoretical aspects concerning problems of division of labor, codified and tacit knowledge in industrial districts; section 3 discusses the characteristics of the data-set and presents some performance indicators; in section 4 the econometric modeling strategy adopted and the empirical results are illustrated; finally, section 5 contains the conclusions.

2. Division of labor, codified and tacit knowledge within industrial districts

2.1 Theoretical issues

One of the main features of industrial districts concerns the role played by tacit knowledge in defining the competitive advantage of the firms belonging to this form of industrial organization. One can try to understand what tacit knowledge is by comparing it with codified knowledge. Codified knowledge refers to any form of knowledge which can be accessed, transmitted and – sometimes – improved by anyone possessing certain abilities (e.g. engineering principles understood and improved by engineers). Tacit knowledge is embodied in either individuals, organizations or systems, but those taking part in using and building it are not necessarily aware of the knowledge creation and learning processes taking place. Both tacit and codified knowledge affect, and are affected by, learning mechanisms as well as the division of labor.

As is widely known in the industrial district literature¹, a good deal of the competitive advantage of industrial districts can be attributed to (tacit) forms of knowledge spillover between firms, while at the same time, a minor role is attributed to intentional efforts.

While such a perspective may explain part of the phenomena under analysis, we believe that other aspects have to be investigated. Indeed, identifying the tacit unintentional form as the main source of knowledge spillover is a rather narrow view of this situation. Also, we want to stress the fact that there exists a relationship between the (district) division of labor, forms of learning and the diffusion of knowledge. In particular, there exists a strong link between Smithian and Arrowian – see below – forms of learning, which in the district production systems come to be highly complementary.

The division of labor arises as a peculiar endogenous feature of the industrial district. The overall production process may be broken down into several phases and each phase may be subdivided into different operations. This gives rise to what may be defined an *organic* district – an adjective that reminds the Marxian one as referred to manufactures² – in which the actual process of division of labor within and between firms is different in different districts. An example may clarify what we mean. If one considers two districts producing the same good, one will observe different ways of organizing the process of production inside the firm as well as within the district – the latter seen as a system. This is what one observes in the case of the footwear districts of San Mauro Pascoli and Fusignano (Cainelli and Nuti, 1996; Brioschi *et al.*, 2002).

Given that the process of production can be organized according to different ways of dividing labor – inside the firm and within the district – we will necessarily observe different paths of development of both individual firms and the system as a whole. Different forms of division of labor create different environments in which learning mechanisms take place.

The two primary forms of learning we want to refer to are the pure Smithian mechanism of learning-by-doing and learning mechanisms *à la* Arrow. The former refers to ‘simple’ learning through repetition: the more one performs an

¹ See Becattini (1989), Langlois and Robertson (1995) and Best (1990).

² Marx (1867 [1976], chapter 14) speaks of *heterogeneous* and *organic* manufactures; the latter is the most advanced form of manufacture, typical of the Industrial Revolution.

operation the faster he/she becomes; learning *à la* Arrow is different, as it considers not only the Smithian mechanism, but also the stimuli which (new) capital goods engender within the process of production: "... each new machine produced and put into use is capable of changing the environment in which production takes place, so that learning is taking place with continually new stimuli" (Arrow, 1962, p. 157).

Both forms of learning occur in any firm – whether belonging to an industrial district or not.

However, two points have to be stressed when we consider firms belonging to a district, while a third point concerns the district's response to changes in demand. First, the learning processes which take place within a single firm have a direct effect on the other firms that work on the same stage(s) of the production process; this occurs through the mechanisms of imitation-competition; an example is the acquisition of new textile machinery in the Italian textile district of Carpi during the 1990s. Secondly, firms' learning processes engender spillovers among firms that belong to different stages of the process of production; an example is that of the tile district of Sassuolo, in which, eventually, some firms have specialized in producing dedicated machinery (Brusco *et al.*, 1996).

The third point concerns the strengths of the industrial district in its capability to adapt quickly and efficiently to changes in demand, a capability which is synonymous with product innovation. Put another way, product innovation takes place as an intentional effort to match demand's mutability. This is a central aspect: the survival of industrial districts, in fact, is associated with their ability to adapt to changes in demand. Confirmation of this is found in our econometric analysis of section four.

To sum up, as a rule, we will observe district-specific forms of division of labor, learning and innovativeness. This means that there exists variety, which is characterized in at least two ways: variety in firms' internal organizational characteristics and variety in the organization of the relationships between firms within the district. One feature of the district firm is that its internal organization may be affected by the other district firms.

Organizational variety, together with the mechanisms which make the district as a whole stronger than its individual components, give rise to the

higher productivity of district firms, as well as to the higher survival capability with respect to ‘scattered’ firms.

Learning, evolution within the processes of division of labor, responsiveness to changes in demand and market conditions can give rise to innovations; put another way, innovativeness is a structural feature of district firms.

This conclusion allows us to better qualify the traditional industrial district theory; in fact, the latter has paid more attention to the role of Marshallian externalities as determinants of better performance of district firms rather than focusing on the intentional nature of innovative activities. Our analysis, on the other hand, focuses on the complementarity between intentional and (Marshallian) unintentional innovativeness.

2.2 From theory to empirical analysis: some clarifications

It is worthwhile to clarify the relationships which exist between the concepts referred to up to now.

(i) First of all, let us recall the fact that the industrial districts literature refers to some mechanisms which make the districts themselves stronger than their individual components. These mechanisms – Marshallian externalities, agglomeration economies, local knowledge spillovers, Smithian learning-by-doing – may have a strong positive effect on innovation and thus on firms’ performance. We have to stress the fact that these mechanisms are largely unintentional – and in this sense we will speak of unintentional innovation.

(ii) Secondly, within firms and within districts one can observe the existence of intentional activities aimed at producing new products, or a new quality of an existing good, or at acquiring new capital goods. Moreover, these forms of intentional activities may engender formalized and codified knowledge. A clarifying example is the development of new products and consequently the necessary new skills/capabilities which must be created in order to produce these new goods. To this intentional stage one can add the Arrowian process of learning, which affects the firm’s performance, and which is likely to lead to proper innovation. Here we have the coexistence of both intentional and unintentional learning and innovation.

(iii) The econometric analysis which follows hereafter will concentrate on the analysis of the three main factors behind firms’ productivity, namely, the

Marshallian externalities, the intentional innovative activity and the joint district and innovation effect. This means that we will not consider the division of labor³.

(iv) The phenomena under scrutiny are quite difficult to be empirically measured. For this reason, as usual in these analyses, it is necessary to make use of proxies. As we will further clarify in section 4.1, we will measure the unintentional and Marshallian mechanisms by means of a ‘district dummy’; the intentional innovative activity of firms’ is captured by ‘innovation dummies’ which also allow us to distinguish the type of innovation introduced by the firm: namely, product or process innovations; finally, the complementarity between unintentional and intentional mechanisms is synthesized by a joint ‘district and innovation dummy’.

To sum up, in what follows we try to measure some of the key forces which characterize industrial districts, paying attention also to the reinforcing mechanism given by the circumstance of being innovative *and* member of a district at the same time. This joint effect is very important both for the individual firm and the district as a whole: in fact, as there exist close relationships between district firms, the transmission of productivity spurts is much more likely to occur within a district environment rather than in an environment in which firms have a ‘simple’ market relationship. Put it another way, within a district the economic relationships between firms include – besides the ‘ordinary’ exchange of goods and services at a given price – a reciprocal influence in terms of processes of production and a bidirectional stream of information on the characteristics of new markets and products.

3. The empirical analysis

3.1 The data set

Our empirical analysis is based on a new firm-level data set built up by matching three different statistical sources: namely, the Community Innovation Survey (CIS), the Italian Structural Business Statistics (SCI –

³ For a theoretical model of the division of labor and learning-by-doing see De Liso *et al.* (2001).

Sistema dei Conti delle Imprese) and the Italian Business Register (ASIA – *Archivio Statistico delle Imprese Attive*).

Data from CIS allows us to measure intentional (codified) innovative activities carried out by the firms of our sample; in fact, the CIS survey gathered explicit information on process and product innovations.

Data from SCI and ASIA provide us with microeconomic structural information at the firm level such as value added, number of employees, capital stock, and so on.

The panel resulting from the integration of these three sources consists of 1,218 traditional manufacturing firms with 20 or more employees. As we have already mentioned, such a choice is motivated by the fact that Italian industrial districts are generally specialized in traditional sectors. The manufacturing sectors taken into account in our investigation are: manufacture of food products and beverages (15); manufacture of tobacco products (16); manufacture of textiles (17); manufacture of wearing apparel, dressing and dyeing of fur (18); tanning and dressing of leather, manufacture of luggage, handbags, saddlery, harness and footwear (19); manufacture of wood and products of wood and cork, except furniture, manufacture of articles of straw and plaiting materials (20); manufacture of other non-metallic mineral products (26); manufacture of fabricated metal products, except machinery and equipment (28); manufacture of electrical machinery and apparatus (31); manufacture of furniture (36); and recycling (37). Finally, the data refer to two years: 1992 and 1995.

We must make it clear that not all of these 1,218 firms belong to a district; put another way, in our sample we are able to distinguish between district and non-district firms. This distinction is based on the so-called Sforzi-ISTAT methodology which allows to empirically identify 199 Italian industrial districts, starting from the information provided by the 1991 Population Census (ISTAT, 1997) – these districts have been singled out starting from the identification of 784 Local Labor Systems (LLS).

4. The econometric investigation

4.1 The modelling strategy

In this section we empirically analyze the role played by intentional innovative activities and Marshallian agglomeration forces on productivity differentials between firms operating in traditional sectors. Furthermore, we test the joint effect of these two forces.

In order to perform this exercise we use an augmented Cobb-Douglas production function (Black and Lynch, 2000 and 2001; Caroli and Van Reenen, 2001)⁴. The equation to be estimated is:

$$\ln Y_{i,t} = a_0 \cdot \ln A_{i,t} + a_1 \cdot \ln L_{i,t} + a_2 \cdot \ln K_{i,t} + v_i + u_{i,t} \quad [1]$$

where $Y_{i,t}$ denotes the value added of firm i in period t , $L_{i,t}$ the number of employees, $K_{i,t}$ is the capital stock and, finally, $A_{i,t}$ represents the state of firm's technology (to which we will come back later); v_i denotes the firm's unobserved time-invariant fixed effect, while $u_{i,t}$ is the error term with the usual statistical properties.

The term v_i included in equation [1] is justified by the likely presence of omitted variables – such as the ability of the firm's management – that can be correlated with the other explanatory variables. Had we not considered v_i we would have experienced a major econometric problem as we would have obtained biased and inconsistent estimates of the coefficients. However, as v_i cannot be observed, we have to find a way to eliminate it. We can do it thanks to the panel structure of our data set. In fact this term can be removed taking the long differences of equation [1]; by means of this operation we can remove the firms' unobserved time-invariant fixed effects, obtaining the following long-differenced production function:

$$\Delta_3 \ln Y_{i,t} = \lambda_0 \cdot \Delta_3 \ln A_{i,t} + \lambda_1 \cdot \Delta_3 \ln L_{i,t} + \lambda_2 \cdot \Delta_3 \ln K_{i,t} + \Delta_3 u_{i,t} \quad [2]$$

⁴ We have tested whether the Cobb-Douglas production function is the most appropriate functional form and we have found that this is true for our data. These results are available upon request from the authors.

Δ_3 denotes the long-difference operator – where t is the year 1995 and $t-3$ is the year 1992; it is worthwhile to stress the fact that $\Delta_3 A_{i,t}$ now measures the rate of technological progress of firm i .

As far as the rate of firms' technological progress is concerned we assume that it can be explained, according to our theoretical setting, on the basis of three different factors: such as (i) the 'district effect' – which captures the Marshallian externalities; (ii) the intentional innovative activity – which we will call 'innovation effect'; (iii) the joint district *and* innovation effect. In econometric terms, these effects can be measured by means of the following dummies :

$$\Delta_3 \ln A_{i,t} = \delta_0 + \delta_1 \cdot Dis_i + \delta_2 \cdot Inn_{i,t-3,j} + \delta_3 \cdot (Dis_i \cdot Inn_{i,t-3}) + \delta_4 \cdot (Ndis_i \cdot Inn_{i,t-3}) \quad [3]$$

The first one is Dis_i which takes value 1 or 0 according to whether firm i belongs to an industrial district (1) or not (0). The second dummy is $Inn_{i,t-3,j}$ and takes a value equal to 1 if firm i has introduced an innovation of type j (j is either product or process innovation) in the last three years ending in $t-3$, and 0 otherwise. The dummy $Ndis_i$ is a complementary variable of the dummy Dis_i , i.e. it is a dichotomic variable which takes value 1 if the firm i does not belong to an industrial district and 0 otherwise⁵.

Looking at the joint effects – i.e. $(Dis_i \cdot Inn_{i,t-3})$ and $(Ndis_i \cdot Inn_{i,t-3})$ –, in particular, should δ_3 be statistically significant, it would capture the complementarity between codified knowledge deriving from the intentional innovative activity and Marshallian tacit knowledge.

Before presenting our empirical results we want to make three points.

(i) First, the value added and the capital stock have been deflated and expressed according to 1992 prices by using appropriate price indices. In particular, value added (Y) has been deflated with the appropriate two digit production price index provided by the National Statistical Institute (ISTAT), while the physical capital (K) has been deflated using the aggregate business

⁵ Let us point out that the innovation dummy is taken with a three-year lag, as innovation requires time to be implemented and to become effective.

investment deflator. In this way, we have made comparable the value of these variables between 1992 and 1995.

(ii) Second, regional and size dummies and a vector of firms' characteristics – such as a proxy for the organizational structure of firms (the proportion of white-collar workers to total workforce) and for the belonging of a firm to a business group – have been inserted in all the specifications used in the econometric analysis. This has been done in order to take into account firms' observed heterogeneity.

(iii) Third, all the estimates, which also include a constant term, have been carried out by using a robust Instrumental Variable (IV) estimator to take into account potential measurement error problems. In fact, a measurement error is likely to be present in the capital stock variable thus producing biases and inconsistent OLS estimates of the unknown coefficients of the Cobb-Douglas production function. To take into account this econometric problem, we apply an IV estimator to equation [2], using as instrument a ranking scheme of the capital variable in question. This kind of instruments are considered especially appropriate when right-hand side variables are measured with error (Bowden and Turkington, 1984). We rank the change in $\ln(K_{i,t})$ and use this rank as an instrument. Intuitively this rank should be highly correlated with the properly measured variable, but not with the measurement error, thus providing a good instrument. Finally, it is worth noting that we have empirically tested this instrument by means of the Hausman's test that has confirmed our choice (Greene, 2000).

4.2 The empirical results

Before presenting our econometric findings we want to comment some descriptive statistics concerning the dependent and independent variables used in the econometric investigation. In particular, Table 1 shows some descriptive statistics concerning our dependent variable: namely, the change in (real) value added between 1992 and 1995. This variable has been disaggregated according to whether a firm belongs to an industrial district, and for both innovative and non-innovative firms. From the analysis of this table there emerges that innovative industrial district firms perform better

than those in an industrial district that do not innovate as well as than those not belonging to an industrial district.

For example the mean value of the change in value added during the period 1992-1995 is about 10% for district, innovative firms, whereas the same value for firms that innovate but are not inside an industrial district is 6.6%. The minimum value of this indicator is taken by firms that do not innovate and do not belong to an industrial district.

Table 1 - The dependent variable: descriptive statistics

	$\Delta_3 \ln(\text{value added})$			
	<i>Non-district firms</i>		<i>District firms</i>	
	[1]	[2]	[1]	[2]
Mean	0.054	0.066	0.093	0.102
Median	0.035	0.050	0.065	0.086
Standard Deviation	0.336	0.404	0.344	0.314

[1] Non innovative firms in 1992

[2] Innovative firms in 1992

Table 2 - The independent variables: descriptive statistics

	Mean	St. Dev.	Min	Max
$\Delta_3 \ln(\text{labour})$	0.015	0.006	-1.235	1.617
<i>District dummy</i>	0.605	0.013	0	1
<i>Innovation dummy</i>	0.444	0.013	0	1
<i>Product innovation dummy</i>	0.337	0.012	0	1
<i>Process innovation dummy</i>	0.400	0.130	0	1

In Table 2 some descriptive statistics regarding the independent variables used in the regressions are reported.

The econometric results are shown in Table 3. Here one can see the findings of the estimate of different versions of the augmented Cobb-Douglas production function.

Table 3 – Long-differenced, firm level, Cobb-Douglas production function (1992-1995)

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
	Dependent Variable: $\Delta_3 \ln(Y)$						
ESTIMATION METHOD	IV	IV	IV	IV	IV	IV	IV
$\Delta_3 \ln(\text{Labour})$	0.568** [0.029]	0.569** [0.029]	0.568** [0.029]	0.566** [0.029]	0.569** [0.029]	0.566** [0.029]	0.568** [0.029]
$\Delta_3 \ln(\text{Capital})$	0.325** [0.010]	0.325** [0.010]	0.325** [0.010]	0.325** [0.010]	0.325** [0.010]	0.326** [0.010]	0.326** [0.010]
Size dummies (2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional dummies (3)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firms' characteristics (2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District	0.016* [0.009]	...	0.016* [0.009]	0.016* [0.009]	0.017* [0.009]	...	...
Innovation (1992)	...	-0.0008 [0.009]	-0.001 [0.009]	...	...	...	...
Product innovation (1992)	...	...	...	0.010 [0.009]	...	...	...
Process innovation (1992)	...	...	...	...	-0.005 [0.009]	...	...
District×product innovation (1992)	...	...	...	...	...	0.022** [0.010]	...
Non-district×product innovation (1992)	...	..	...	...	...	-0.007 [0.013]	...
District×process innovation (1992)	...	...	...	...	...	...	0.004 [0.010]
Non-district×process innovation (1992)	...	...	...	...	...	...	-0.021* [0.012]
N. Obs.	1,218	1,218	1,218	1,218	1,218	1,218	1,218
Adjusted R ²	0.722	0.721	0.722	0.722	0.722	0.722	0.721

Note: Standard errors are in parenthesis. ** denotes significant at 5%, and * denotes significant at 10%. The estimates also include a constant term.

In the specifications shown in Table 3, all of which use the control variables previously mentioned (see point (ii) in section 4.1 above), the sign of the two coefficients – labor and capital – is statistically significant and positive as expected. The values of the adjusted R² are also particularly high. This implies that our regression equations explain a significant share of the variation in the dependent variable: that is the firms' productivity. Let us now examine the single specifications.

The first column shows that the district dummy is positive and statistically significant in explaining firms' productivity differentials in traditional sectors. This confirms the industrial districts literature idea according to which being part of a district has positive effects on the firm's performance. In other words, the mechanisms connected to co-operation and competition between firms, to local knowledge spillover, and more in general to the Marshallian industrial atmosphere, generate positive externalities. This district effect is supported by both theoretical, empirical and econometric evidence (Becattini *et al.*, 2003; Brioschi *et al.*, 2002; Signorini, 1994).

The second column shows that the dummy which captures intentional innovative is not statistically significant. This result – as we shall show in the comment related to columns four and five – deserves further investigation, even though at first sight it seems to confirm that firms working in traditional sectors realize little innovation. In fact, as we will show later, when we distinguish between *process* and *product* innovation the picture we have changes.

Column three considers simultaneously the district and the innovation dummy, confirming the previous results. In fact the district dummy is still positive and statistically significant, while the innovative dummy is still not statistically significant. This means that firms operating in traditional sectors definitely benefit from unintentional forces. In other words, these findings are consistent with the general perception about the functioning mechanisms operating within a Marshallian industrial district.

An element of advantage of our data-set is that we can discriminate the type of innovation introduced by the firms, i.e. product and process innovation. In this way, we can empirically test the role played by each of these two forms of innovation on firms' productivity.

In columns four and five, two different innovation dummies have been introduced into the Cobb-Douglas production function. The first refers to *product* innovation carried out by the firms (column four), while the second one refers to *process* innovation (column five). As one can see from Table 3, the coefficients of both the product and process innovation dummy are not statistically significant. According to this evidence, productivity of firms operating in traditional sectors does not seem to depend on forms of

innovation such as the development of new products or the acquisition of new capital goods.

However, the above result changes when we take into account the localization of firms. In fact, we have inserted into the modified production function the interactive dummies $(Dis_i \cdot Inn_{i,t-3})$ and $(Ndis_i \cdot Inn_{i,t-3})$ in order to empirically detect the presence of complementarity between innovative activities and the membership in an industrial district. In particular, the joint district and product innovation effect has been tested in column six, while the joint district and process innovation effect has been tested in column seven.

The findings of this exercise are quite interesting. In fact, from the analysis of the results shown in column six there emerges that the interactive dummy capturing the joint district and product innovation effect is positive and statistically significant. Also, we have to note that the value of this coefficient is higher than any of the other values considered. Put another way, district firms which introduce product innovations are characterized by better performances. This result differs from what is generally emphasized about the nature of industrial districts – i.e., according to traditional theory, intentional innovative activity plays a minor role. A clear distinction has thus to be drawn: while district firms do not perform well in terms of process innovation, they perform very well in terms of product innovation – and the latter one is an intentional form of innovation. Product innovation plays a central role in defining the competitive advantage and, therefore, the economic performance of firms operating in these sectors. This advantage is amplified by being a member of a Marshallian industrial district.

5. Conclusions

In Italy more than 47% of manufacturing firms are concentrated on traditional sectors such as food, textiles, leather and shoe, wood, furniture, etc. In terms of value added, the share is 38.1%. Among the European countries, only in Spain we find similar patterns – 49,5% in terms of employment and 37,6% in terms of value added (data refer to 1995). Most of these firms are localized in Marshallian industrial districts.

As is well known, the district literature has emphasized the role played by co-operative and competitive relationships between firms, local knowledge spillover and, more generally, the industrial atmosphere. All of these factors engender positive externalities, thus positively affecting district firms' performance. However, these positive factors are usually associated with a low level of innovativeness: the fact that within industrial districts, firms carry out little innovative activities is acknowledged.

Our work on the one hand confirms the existence of the typical district effect, while on the other hand it identifies a much higher innovativeness than usually acknowledged. In fact, we show that traditional sectors, at least in Italy, perform more innovative activities than they were thought to, and this component has to be 'added' to the spillover effects which have been always recognized as important, even though difficult to quantify. This innovative activity takes the form of product innovation. In fact, this type of innovative activity seems to find into production structures such as those of the Italian industrial district a favorable environment which exerts a positive and significant influence on firms' economic performance.

Another key result consists of the empirical identification of the joint district and innovation effect which suggests a more complex interactive mechanism between Marshallian externalities and intentional innovative activities. In fact, what emerges from our econometric investigation is that there exists complementarity between formal and informal (district) innovative activities. In other words, the transmission of ideas, imitation and, broadly speaking, knowledge spillovers, seem to stimulate for some groups of firms and for some industrial districts more innovation activity as well.

These findings have interesting policy implications as the latter have been largely based on the idea that the innovativeness of industrial districts had to be attributed to informal phenomena such as 'unintentional' knowledge spillovers and 'simple' imitation. Our results indicate that policies aimed at stimulating local systems should also take into account the role played by intentional product innovation.

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