Measuring the *district effect*. Reflections on the literature [*]

GIACOMO BECATTINI and FRANCESCO MUSOTTI

1. A bird's eye view of Italian studies on the industrial districts

Discussion of the industrial districts has been going on for several decades by now, and an immense amount of both descriptive and theoretical literature has appeared. Indeed, Florentine researcher Elisabetta Tessieri (2001)[1] has made a creditable attempt to compile a bibliography of this literature, which is eloquent evidence of the latent need it set out to meet with its proposed formulation, at least for studies on industry and territorial location in Italy.

An interest in the empirical phenomenon of the industrial districts has grown at more or less the same rate as investigations into the concept of the industrial district and its corresponding 'theorizations'. Reactions from the community of economists have not always been totally favourable. In many scientific circles the appearance of a concept both complex and fuzzy was considered bothersome, if not rejected outright. What particularly made many colleagues apprehensive was the shift of the main unit of analysis from the single eco-

☐ Università degli Studi di Firenze, Facoltà di Economia, Dipartimento di Scienze Economiche, Firenze (Italy); e-mail: becattin@cce.unifi.it;

Università degli Studi di Perugia, Dipartimento di Scienze Economiche ed Estimative, Perugia; e-mail: fmusotti@unipg.it.

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[1] As part of a research project entitled "A territorial re-reading of economic change in contemporary Italy".

nomic subject to an intermediate social entity, whose epistemological status was not clearly outlined. Since the mainstream of contemporary economic thought maintained that the triumph of methodological individualism had finally been established, they felt that one of the fundamental bases was being challenged.

An approach based on historically defined and shaped human communities negated (or surpassed?), at least in part, the disciplinary methodologies that had prevailed during the last century. Indeed, investigations of a group of individuals who identify themselves with a certain community imply a synergistic convergence of economic, sociological, anthropological, historical, geographical and organisational studies. This systematic trespassing over the boundaries of disciplines regarding the life of man in society, so carefully demarcated in the previous century, was – to the eyes of most economists – positively dangerous.[2]

Even at an intermediate level of economic theory – theory of firm and market, that is – the concept of the industrial district presented many difficulties. In the first place, all the problems of the small firm, meticulously documented in an enormous amount of literature, were linked to the principle of asymmetry, clearly formulated by Joseph Steindl (1945). He maintained that everything that can be done by small firms, can be done by larger ones as well, but not vice versa. From that principle stems the conclusion that not only were small firms precarious – as shown by their fairly short average life span – but they were also, with few exceptions, technically less efficient and less remunerative than larger firms.

All these 'theories' posed obstacles to acceptance of the idea of the industrial district (perceived as a hodgepodge of small firms) as an economically efficient entity. According to these theories, if the industrial districts were in fact successful, it could only imply over-exploitation of hired labour and self-exploitation of the small entrepreneurs. Furthermore, the system allegedly produced a working and living environment even worse and more precarious than the condi-

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[2] Marshall, the inventor – if so we may call him – of the original concept of the industrial district, was considered the arch-enemy of the critics of neoclassical theory. In particular, his concept of economies external to the firm, yet internal to something else, appeared confused and misleading. Sraffa interpreted Marshall's theoretical use of it as an apologetic expedient to reconcile the phenomenon of increasing returns with the equilibrium of competition, that is, to explain and justify capitalism.

tions prevailing in the areas of small firms dominated and polarised by a few large firms.[3]

Another shock came in 1992, when the authoritative financial daily *Il Sole 24 Ore* started publishing a barrage of development and standard of living indicators that placed medium-sized towns such as Modena, Reggio Emilia, Parma and Siena, etc., permanently at the top of the list. The myths of the cultural superiority of the urban metropolis and of the big city as a consumer paradise both suffered a mortal blow. Two tenets of the modernistic hegemonic vision – that the large firm was technologically more advanced and that the big city could guarantee, on average, a superior life style and standard of living – wavered and fell, and the way was now open to acknowledging the successes of smaller industrial communities, which was exactly the case of the industrial districts.

In the initial debate on the industrial district, one of the difficulties that economists had in accepting the notion was due to the presence of a number of fuzzy terms, such as *belonging, identification, reputation,* right up to Marshall's "industrial atmosphere". Actually, mainstream economic theory did not present a compact front against the industrial district, there being some significant developments (neo-institutional economics, evolutionary economics, game theory, etc.) that offered partial openings to the district theory, and helped focus on certain particular aspects.

One such opening was provided by management studies. These studies stressed how the efficiency of firms was dependent on their environmental context, i.e. the naturalistic, social and cultural context. In the same studies, the simplistic view of the firm as a compact unit evolved towards the concept of an inter-firm network. These developments eventually converged into the notion of the 'district firm' (Varaldo and Ferrucci 1997), clearly distinguished from the non-district one. Yet there was obstinate refusal on the part of many scholars to draw the right conclusions from these considerations. What most amazed the 'districtualists' was the deafness of scholars in two

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[3] We may recall the shock caused almost 30 years ago, in 1975 – although it seems just the other day – by the research conducted by Sebastiano Brusco (1989), which concluded that small engineering firms around Bergamo were no less technologically up-to-date than comparable large firms. This conclusion went against two of the most consolidated principles of prevailing economic wisdom: that technological innovation comes through investment and that large firms invest more.

contiguous fields of study, namely regional economics and economic geography. Although works on the topic did occasionally appear, the substantial 'resistance' to the industrial district approach was clear.[4]

A totally different situation developed as far as agrarian economists and economic sociologists were concerned. The former were open to the district theory because their training and studies were relatively immune to the formalistic abstractions of the standard theory of the firm.[5] By 1992 (Iacoponi 1990, Cecchi, Cianferoni e Pacciani 1991, Cecchi 1992)[6] they had already opened up to the district concept, in both the rural and agro-industrial versions.

Economic sociologists such as Parri (1997), Bagnasco (1999) and Trigilia (2002) promptly accepted this new link with economic studies by developing some important and peculiar aspects (e.g. civicness, red [Communist] and white [Catholic] political subcultures and pre-existing connections with forms of settlement [multi-polarity]). At the intersection between the two fields we have research pointing to a correlation between the industrial district and the pre-existing forms of agricultural management (e.g. share tenancy) (Musotti 1997 and 2001).

A further obstacle to acceptance of the industrial district concept arose from the consolidated attitude of industrial historians, accustomed to a sectorial approach in the study of industry, their in-depth analyses based mainly on large public and private firms equipped with rich archives. This produced a marked asymmetry in the study of the features of, and developments in, small and large firms. The only exception to this practice was an influential article by Poni (1990) on the silk industry in Bologna in the seventeenth century. Lacking a full complement of historical-geographical studies, the Italian districts seemed to have no past, like flowers blooming in the desert, for unknown reasons.

A conference held in Vicenza in 1994 proved decisive. For the first time, the two key approaches to understanding the patterns of industrialisation were compared. The first, or classical approach, based on industrial sectors, formed part of a masterly report by Mathias (1998), while the second, still in its embryonic form, was pre-

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[4] The efforts by Krugman (1991) to fill the gap between economics and economic geography belong to a more recent period.

[5] See the argument in *La Questione Agraria*, nn. 1, 2, 3, 2000 and n. 1, 2001.

[6] See Cecchi (1992).

sented by one of us (Becattini 1998, 2001 and 2002b), and focused on the process of 'districtualisation', rather than on the district itself.

So it was that the districts made their entry into economic historiography – at first rather cautiously, in a manual by Vera Zamagni (1990), and then with growing incisiveness through a succession of special research projects, articles and books now fairly abundant.[7]

The theoretical economists, for their part, embarked upon various attempts at analytical approaches to the district (Tani 1987, Dei Ottati 1995, 2003a and 2003b, Dardi 1997, Brusco 1999, Folloni and Gorla 2001, Bellandi 2003a and 2003b, and various others).

All these categories of scholars, either supporting or opposing the theory, made contributions that helped specify the 'social and economic setting' of the industrial district, exploring it in depth and in its interconnections. Thus, by the mid-1990s the main idea and various parts of a sort of theory of the industrial district had, in fact, come into existence.

Going back to 1985, in the course of a Florentine "Small town, small firm" conference jointly organised by IRPET and the Florence Faculty of Architecture, Fabio Sforzi, then an IRPET researcher (Sforzi 1987), presented a methodology for identification of the district. This proved so convincing that ISTAT (the national institute of statistics) decided to adopt it for the task of dividing Italy into local labour systems.

Later on ISTAT, again with the collaboration of Sforzi, set out to identify those of the 784 local labour systems singled out in the 1991 population and productive activities censuses that could be defined as industrial districts. The 199 industrial districts identified (ISTAT 1996, Figure 1) were scattered throughout almost all the regions, but were mainly located in Emilia Romagna, Veneto, Tuscany and the Marches. These were the same regions that earlier studies had labelled as either "the Third Italy" (Bagnasco 1977) or as NEC (Fuà and Zacchia 1983). The significance of these concentrations of districts was immediately evident, in terms of both employment and per capita income (Fortis 1996), but above all with regard to their ability to export (Conti and Menghinello 1996, ISTAT 2002).

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[7] See, e.g., Guenzi (1997), Amatori and Colli (2001), but also Panciera (2000) and several other works.

With official definition of the industrial district areas it was now possible to compare the levels of certain indicators between district and non-district areas.

From this point on two ways lay open to studies on the industrial districts: the traditional approach, with monographs on the single districts, and the new line, making econometric comparison between populations in 'district' and 'non district' areas. There was an authentic blossoming of monographic studies on the various levels of the main industrial districts, particular attention concentrating on the archetype of all Italian districts, namely the textile district of Prato.

During the third edition of the "Settimane pratesi sullo sviluppo locale" ("Prato's weeks on local development") in 1993, Luigi Federico Signorini of the Research Department of the Bank of Italy conceived a project to verify the oft-repeated statements on the social and economic virtues of industrial districts, using sophisticated econometric tools. As he openly admitted, Signorini was, at the time, very sceptical about these observations.

The first outcome of this project was a comparison between two textile districts, Prato (Tuscany) and Biella (Piedmont), which Signorini (1994) published in the first issue of the new journal *Sviluppo Locale*. Later on a group of researchers from the same Research Department began systematic comparison of certain crucial aspects of industrial activity in district and non district areas. The results of this phase have appeared in a book entitled *Lo sviluppo locale* (*Local development*) (Signorini 2000a).

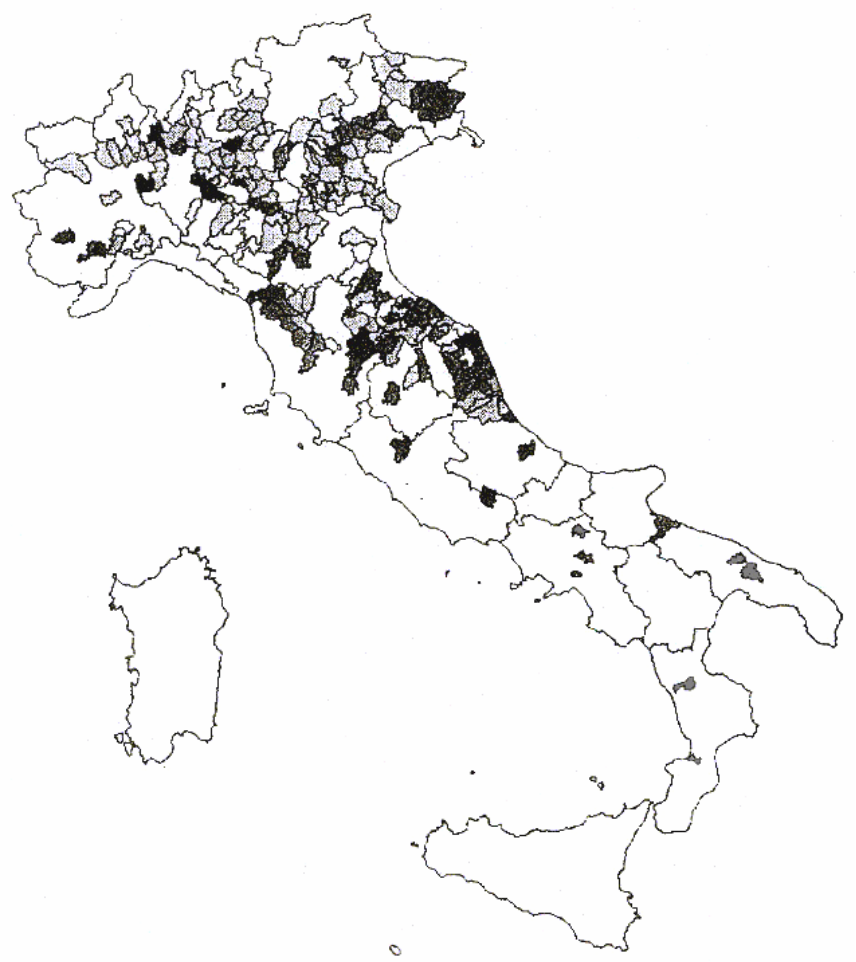
The findings of this econometric investigation substantially bear out the results of other surveys conducted in the single districts. Thus the preliminary phase of the district studies can be considered completed. Research should now add new evidence and, above all, refine and implement the theory.

2. Econometric investigation into certain characteristics of the Italian districts

The research project carried out by the Bank of Italy marks a turning point in the study of industrial districts since it affords quantitative examination of some basic conceptual frameworks.

FIGURE 1

THE ITALIAN INDUSTRIAL DISTRICTS IN1991



Source: ISTAT (1996, Cartogram 5.2).

The material supplied is essential for two reasons. On the one hand, it offers reliable measurements of the levels of *performance* achieved and consolidated by the districts. On the other hand, given the feedback normally transmitted to theory by empirical analysis, it opens the way to new prospects for future research.

An econometric exercise implies that the features of the phenomenon under investigation be translated into explicit, analytical terms and relationships. In this way the underlying conceptual system is clarified and its gradual organisation into a logical, detailed and systematic framework is facilitated and encouraged.

Thus notions applied with reference to the districts, like 'industrial atmosphere' and 'local external economies' are defined in such a way that their presence and extent can indirectly be determined. Once that is done, further study of their single determinants and the relationships connecting these determinants can be carried out. Every answer opens the way to new questions.

It should be noted, however, that the use of econometric tools channelling research towards more easily measurable aspects to some extent distorts the interpretation of a phenomenon. The econometric approach entails both advantages and hazards. Nevertheless, we believe that, at least at this stage in research on the districts, the advantages largely outweigh the hazards.

An important point not be underestimated is that, if we are to include the contribution of econometric analysis while at the same time seeking to eliminate its intrinsic limits, we have to proceed simultaneously in the fields of historical and sociological analysis. Comparison of the features emerging from a number of local situations, provisionally defined as industrial districts according to an algorithm of uncertain and variable validity, should prompt more searching analysis in certain specific cases. The relationships in the proposed paradigm can be used for qualitative and quantitative confirmation of the general econometrically identified relationships, and above all, to open new paths for research and theoretical considerations. One of the main characteristics and, perhaps, virtues of the analysis of industrial districts lies within this spiral of 'extensive' and 'intensive', or 'thin and 'thick', research, as some anthropologists would say.

3. The superior productivity-efficiency of district firms

The currently prevailing point of view has it that exploration of the *district-effect* must start by focusing on the profitability, productivity and efficiency of each single firm. In other words, the first question is:

are the district firms (DF) more productive and/or efficient than their competitors due to the particular context in which they operate?

Research on this subject (Fabiani *et al*. 2000) was developed at two interrelated levels:

1) analysis of accounting results (1992-95), comparing two standard indicators (return on investment, ROI, and return on equity, ROE) in order to test the hypothesised higher profitability of the district firms (DFs);

2) econometric analysis of information obtainable from the same accounting database, estimating stochastic production frontiers (SPF) to see whether the possible higher profitability of those firms depended on their belonging to the district's social and economic environment.

Having classified the firms in the two main categories of 'district' (DF) and 'non-district' firms (NDF),[8] scrutiny of the accounting information[9] brought out the following aspects.

1) The ROI throughout the entire period under consideration was systematically higher in the DFs, and in 1995 the indicator was, on average, about two percentage points higher than the figure recorded for the NDFs (13.54 compared to 11.55). The advantage is

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[8] The database used was from archives of the Centrale dei Bilanci and refers to about 10,900 firms, distributed in 13 manufacturing sectors and with 10 to 249 employees, therefore small and medium firms, according to the EU definition. The period covered by the database is 1982 to 1995 and makes fairly robust evaluations with regard to conjunctures.

Let us recall that the Centrale dei Bilanci collects accounting results on about 30,000 firms operating in all sectors. These firms have been selected only if they have relations with more than one bank, so an over-representation of the more dynamic ones is probable.

The 13 sectors identified are: food, beverages and tobacco; textiles and clothing; leather products; wood and wooden products; paper, printing and the publishing trade; chemicals; rubber and plastic; products made from non-metalliferous minerals; metal and metal products; machine equipment; electrical equipment; means of transport; other manufacturing industries. Firms with fewer than 10 employees were excluded from the analysis because of the limits of reliability that the accounting documents of minor companies usually show.

[9] All those firms with legal headquarters in the 199 local labour systems that ISTAT defines as "industrial districts" on the basis of the 1991 census information were considered as district firms (DFs). This definition does not depend on belonging to the sector characterising each district and is consistent with the district theory. In the district the organization of the firms and the inter-firm network depend on characteristics of the local society (know-how, values and institutions) which tend to influence all the local industries.

seen in all 13 sectors, with a maximum in the smaller firms (15.25 compared to 12.77). This confirms the extent to which the 'district environment' can modify conclusions drawn exclusively or predominantly with reference to the firm size (Figure 2).

2) The ROE, during the entire period under consideration, is again systematically higher in the DFs, the gap widening by four percentage points over average in 1995 (11.01 versus 6.9). In this case the advantage DF is found in 12 out of 13 sectors and, as in the case of ROI, shows maximum values in the smaller firms (11.15 compared to 6.36), namely in those in the 10 to 19 employee range (Figure 2)

3) In 1995, similar advantages in terms of profitability coexisted with lower labour costs (per capita). These lower labour costs, however, stemmed essentially from the contribution of the less 'districtualised' sectors (Fabiani *et al*. 2000, Table 4). The same advantages seem to depend, slightly, on an average of passive interest rates towards the financial intermediaries marginally lower than that of the NDFs (7.84 as opposed to 8.03).

More sophisticated indications regarding this superior *performance* and, therefore, the origin of the *district-effect* come from panel SPF estimation on the same sample of firms observed over a 5-year period (1991-95). In particular, an SPF estimate was made for each of the 13 sectors considered.[10]

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[10] We believe it useful to underline that SPF can be viewed as a compromise between the 'pure' approach and the 'economic' approach to production, which is convenient, in econometric terms, since it is not too demanding in terms of data.

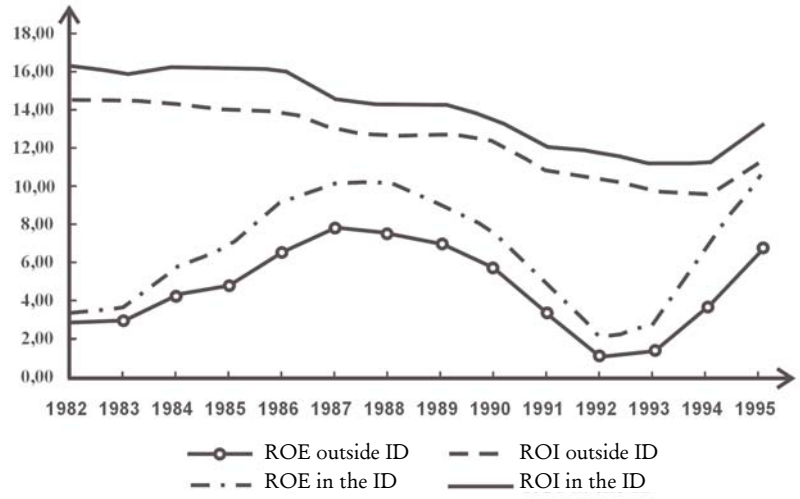
By 'pure' approach, we mean the *standard* marginal theory, based on the notion of production function and assuming the process of transformation of *inputs* into *outputs* be a 'black box' and, therefore, substantially a fully 'exogenous' technical outcome, which the economist has to accept as an optimal solution to the problem of combining the production factors (Tani 1989). Indeed, such an assumption is realistic for identification of the so-called *technique-recipe (*Romagnoli 1996) that is, the combination of certain factors (the "flows") that determine the maximum output (output efficiency).

A different matter, depending totally on the entrepreneur, is the choice of the productive technique (input efficiency) through which the technique-recipe works; that is, the activation of other factors (the "funds") by means of a combination of technical coefficients. An economic approach to the production process according to which the characteristics of the *productive technique* strictly depend on the choices of the entrepreneur and his factorial endowment and knowledge has been developed at a theoretical level from models with far richer descriptive contents.

Georgescu-Roegen's "funds and flows" approach (Georgescu-Roegen 1982, Romagnoli 1996), for example, is an extremely useful way to read the empirical evidence

FIGURE 2

ROI AND ROE



Source: Fabiani *et al*. (2000a, p. 23).

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of industrial districts. By means of the systematic and progressive division of productive tasks, or rather parts of them, it accounts for how *n* different ways exist (each efficient in its own context) of manufacturing the same goods. The notion of SPF retains the core of the 'pure' theory as it implies the *best practice* for an entire sector as an assumption and also defines a set of flexible productive coefficients at work, so that marginal technical rates of substitution among various production factors occur along the productive frontier.

However, this leads to a more consistent representation of reality, because it presupposes a process where 'agents' other than the classical *inputs* (capital, labour and so on) are at work, influencing the way those classical inputs combine over time and space (i.e. in a specific firm) and determining the 'distance' (in terms of negative residual of output) from the most efficient combination. It is clear that these agents can be extremely various, either internal or external to the firms, and that the empirically identified residuals always constitute an approximation to reality. The nature and extent of this approximation obviously affects the meaning of the estimations. In rigorous terms one could speak of an estimation of inefficiency only if the *inputs* and *outputs* were perfectly homogeneous in the firms, whereas one should speak more generally of marginal productivity if, as indeed happens, *inputs* and *outputs* are heterogeneous.

In our comparison between DFs and NDFs we have many reasons to believe that the causes and extent of this heterogeneity are truly relevant. Moreover the idea of the *best practice* is a less convenient assumption, as the products range within a given sector increases and the best practice that can actually be identified for each of them is necessarily an 'average' of many best practices. Furthermore, heterogeneity is reinforced by the fact that what is actually estimated as a single technical process is not just a pure, single, technical process, but rather, a more general creation of value by the overall functions (and processes) of the firm.

The results show that the *district effect* is statistically significant in 10 out of 13 sectors, and that, in 8 of these, it plays a positive role, in that it tends to reduce negative residues with respect to the corresponding SPF value. This is particularly apparent in those sectors where the district model of organisation is characteristic of traditional Italian production: e.g. textiles and clothing, leather goods and products from non-metalliferous minerals. These results are confirmed, and further borne out, with repetition of the same estimates on a reduced sample of firms in the central and northern regions. If these regions were not isolated, the *district effect* could have been influenced by the negative repercussions of including firms from Southern Italy.

Thus, having 'residually' and 'synthetically' quantified the *district effect*, its specific determinants, which stem from a local concentration of external economies, should be explained in both quantitative and qualitative terms. These external economies are of various types.

The *economies of organisation* are those which encourage the processes of the division of work (of production strictly speaking and of other typical functions of the firms: procurement of raw materials, logistic services and marketing). Consequently, efficient 'subcontracting markets' are set up with a very high degree of specialisation and there is a saturation of *funds* allocated to single firms. These firms are continually re-clustering in an evolving mosaic, and are able to reach advantageous production level thresholds for standardised products, and benefit from economies of scope by means of flexible integration for differentiated products.

The *economies of knowledge (contextual) and learning* are those stemming from a network activity concerning continuous and small 'technological' (*hard*) innovations, implying lower costs, and 'formal' (*soft*) innovations, implying *premium-prices* by means of differentiation. Such is the case with design-based industries – fashion, for example.

The *economies of concentration* on the markets of intermediate inputs (raw materials, semi-manufactured products, energy, etc.) are those that arise when the districts, through their networks of special-

ised operators, can behave as collective purchasers and thus obtain better prices.[11]

The *economies of training* are equivalent to those of organisation in terms of training human resources, and in terms of entrepreneurial *humus*; that is to say, in accumulating human capital which benefits (in the broader Smithian sense) from the division of productive cycles and consequently from ever-increasing specialisation.

The *economies of transaction* consist of a significant reduction in information asymmetries, deriving from the fact that all involved know one another. This helps to consolidate precious co-operative links between components of the system operating at different, interconnected stages of the production cycle and not competing directly, at least in the short term. The reduced cost of bank credit for firms, otherwise inexplicable, can be taken as evidence for this (Finaldi Russo and Rossi 2000).

The *economies of adaptation to change* derive from the formation and diffusion of a spontaneous belief that the sacrifices that each crucial component (entrepreneurs, workers, public administrations, households, etc.) must make is for the common good of the district. These economies are strictly related to the socio-cultural and political structure of the 'district' community.

It is evident that similar phenomena, which should be analysed separately, and investigated in depth, are only incidentally or improperly perceived with an approach based on the stochastic production function (SPF).

The economies of organisation, for example, which influence the degree of saturation of *fund* factors (materials and human resources), can affect estimation of the residual, making definition of a production function where we represent stock values (referring to *fund* factors) on the one hand and, on the other, *flow* values (the output) even more debatable, as Georgescu-Roegen (1966) contends.

The economies of (contextual) knowledge and training progressively modify the qualitative characteristics, and even the potential of human resources (workers, entrepreneurs). Therefore, they too in-

[11] In Italy this possibility has been perceived and encouraged, for example, by certain energy suppliers, such as Edison Spa.

consistently contribute to the residual, whereas they should rather suggest a different quantification of the factorial endowments.

Perception of economies of transaction is even more complex. It intrinsically entails a compression of standard market costs (within the district), which also 'contaminate' all the other *economies of coordination* typical of the inter-firm organisation.

In spite of the problems and logical difficulties considered above, we believe it possible to conclude that most of the research carried out by the Banca d'Italia confirms the basic fact that firms clustered into districts are very often, or rather almost always, *ceteris paribus*, more 'profitable' than NDFs.

3.1. *Some possible pitfalls*

Other possible aspects of the aforementioned estimate to discuss are of a strictly econometric nature and concern challenging problems of endogeneity, always to be expected in analytical cases of the sort. If the areas showing industrialisation above the Italian average, the higher level being due to a heavy concentration of small-medium firms, are defined as districts, then it might be tautological to verify the very same small-medium firms were more efficient than all the others located in different areas. Their greater efficiency would be implicit in the fact that they had found a way to proliferate mainly within those areas where they are observed.

Although such criticisms may have some foundation, they do not, in our opinion, invalidate the results obtained by the researches of the Bank of Italy.

The definition of a district firm adopted by the researchers of the Bank of Italy, i.e., a firm located within a "local labour system" that presents certain requisites (ISTAT and Sforzi 1997), irrespective of whether it belongs to the sector that characterises the district (in which the strongest specific external economies mature), already represents in itself a good guarantee against endogeneity, as can be argued by the fact that it is also the object of exactly the opposite criticism (Tattara 2001).

Furthermore, non-district small-medium firms are not necessarily isolated and, therefore, at a disadvantage a *priori*. Very often they form part of a translocal network of firms, in which they use non-

local external economies (consider the 'extended' networks of sub-supplying) or part of non-district local systems (consider urban agglomerations with relative specific external economies), which cannot be considered inferior a *priori* to district ones.

The comparative efficiency evaluation was carried out by Bank of Italy researchers not only for the entire national territory but also for the aggregated central-northern regions. The results obtained do not present substantial differences, and it can therefore be deduced that the weight of isolated firms (firms that do not benefit from the proximity of external economies or other forms of inter-firm linkages), presumably with a much greater presence in the regions of the South, is not enough to influence the results in an appreciable way. Therefore, the comparison essentially concerns district firms and comparable firms within systems of another type. For this reason, we wish to stress yet again that the comparisons cannot be looked upon as 'distorted from the start', as some authors assert.

4. The international competitiveness of the industrial districts

International trade is the second perspective from which the *district-effect* is measured. Once the higher productivity of the DF has been ascertained, it appears self-evident that we should try to understand to what extent the advantages of the district environment can translate into a better capacity to cope with the forces of international competition.

The researchers from the Bank of Italy developed two tests.

1) The first is an 'extended' and eclectic Heckscher-Ohlin (H-O)-type test. It refers to a link between net sector exports ('revealed comparative advantages') and a group of variables along with the traditional aggregated factors of production that represent some of the technological and organisational requisites influenced by location in a particular space, according to hypotheses stemming from the "new economic geography (NEG)" (Krugman 1991).

2) The second test derives almost entirely from the NEG framework, and is concerned with direct quantification of the spatial factors able to generate competitive advantages.

In the first case (Gola and Mori 2000) a panel exercise was carried out on data distributed over 84 manufacturing sectors observed over a 13-year period (1983-95).[12]

The estimations on the classical H-O equation show limited outcomes. The three variables tested are statistically significant, yielding evidence consistent with the established knowledge concerning the Italian model of trade specialisation: positive for labour intensity and negative for capital and human capital intensity.

Four other variables were included in the equation to estimate source of increasing and decreasing returns of scale (geographic concentration, transport congestion, internal dimension of firms and 'districtuality'); this increased the explicative power of the model by about 50%. The results did not alter the statistical significance of the three classical factorial variables, while evidencing the negative impacts of geographical concentration, transport congestion and average firm size, together with the positive impact of 'districtuality'.

It should be noted that the identification of the *district effect* in determining sector trade balances cannot be limited to the coefficient and the sign of the variable explicitly put to proxy it.

Definition of the variable related to human capital (defined as the difference between the average wage measured for each sector and the lowest average wage) is significantly influenced by the impact of the 'codified' human capital, or in other words the part of knowledge

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[12] "Data concerning the firms come from the DEFLAZ database of the Centrale dei Bilanci. This is a closed sample of 5,054 industrial firms, representing the Italian manufacturing industry. The firms have at least one employee. In this archive, data are made homogeneous over time through the construction of fictitious accounting units able to allow for all the extraordinary operations of the firms (mergers, demergers, etc.). The data are opportunely deflated using the general price index" (Gola and Mori 2000, p. 83).

First a traditional H-O equation is tested, regressing the normalised sector balances of Italian international trade only on the intensity of three productive factors (on the value added): capital, human capital and labour.

At a later stage, the estimate was made on an extended H-O model, including not only the variables of factorial intensity, but also 4 proxies of organisational and territorial phenomena: 1) geographic concentration of production; 2) extent of the districts; 3) average size of the firms in the sectors and therefore the relevant potential internal return to scale; 4) transport costs associated with phenomena of congestion.

strictly associated with the amount of material capital per employee.[13] The best international performance is associated with sectors where this ratio is lower, with a greater presence of districts and their wealth of human capital, in terms of practical or 'contextual' knowledge (Becattini and Rullani 1996). The finding that there is a relatively high, negative correlation between the amount of human capital and 'districtuality' offers confirmation of this. As expressed in the equation, 'formal' human capital (i.e. deriving from formal education) in the Italian manufacturing industry has a negative impact on international trade, whereas 'contextual' human capital, particularly well preserved in the districts, has a positive effect. This effect should be added to that expressed by the districtuality indicator in the equation.

On top of all this, however, we also have the positive contribution of labour intensity itself, which is influenced by the *district effect* since the sectors in which the districts and the connected contextual knowledge are strongest are those with the highest labour intensity per value added unit. We may therefore quite logically assert that, if Italian trade can consider labour a strength, it is because this factor is based on the contextual knowledge in the districts.

The second analysis (Bronzini 2000) focused on the effects that factors spatially-located on a provincial scale should have on our country's exports. The equations used for the estimation referred to a three-year average (1995-97) and concerned both the Italian manufacturing industry as a whole and 17 different sectors within it.[14]

The estimate of the aggregated equation indicates that the district proxy (calculated as the share of employees in the district *Comuni* out of the total employees in the *Provincia*) and infra-structural indicators (endowment of roads, motorways, ports, airports, electrical and water systems) account for a positive effect. A positive effect, al-

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[13] In general, it is obvious that the average level of sector pay reflects the influence of contextual knowledge, too. But, empirically, one sees that higher pay is associated with typical capital-intensive sectors, and in particular the material and 'formal' human capital intensive sectors.

[14] The equation for the entire manufacturing industry, based on pooled data (17 sectors for 95 provinces), accounts for the logarithms of provincial exports per employee, compared with the national average, by the logarithms of: the extent of districtuality, the average number of employees in the local units, infra-structural endowment, on two macro-territorial *dummies* from the Ceentral and Southern Italy and 17 sector *dummies*. The statistical results of the estimate are acceptable: the variance explained by the model is 34% of the total, and both the coefficients of the two logarithmic regressions and the two territorial dummies were highly significant.

positive effect, although statistically less reliable, can also be seen in the case of the average number of employees. The two territorial locations referred to were Central Italy and Southern Italy. Both have a negative impact. The estimates of the sector equations confirm these findings,[15] which include substantial identification of the *district effect*.

In this connection there are two observations to be made.

First, from a theoretical point of view, we must consider just how consistent the NEG frameworks are with those now being formulated on the experience of the industrial districts. In our opinion, there is a crucial preliminary point that must be clarified. How can an idea of reality based mainly on the concept of *space* (intended as a homogeneous context and defined 'exogenously' *a priori* in relation to a particular subject), like that of the NEG, be linked with another one, as in the case of the districts, which is based on the concept of *territory* (in the sense of the outcome of a process of spiral-shaped interaction between an organised human community and its environment)?[16]

Another observation arises from statistical considerations and concerns the database used for the analysis, which does not allow for inter-regional trade and thus underestimates the export capacity of

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[15] The 17 sector equations are based on a pooling of annual-provincial data and temporal *dummies* referring to each year (1995-1996-1997).

The findings bear out the ones relevant to the manufacturing complex. In all 17 sectors the district proxy emerges with a positive sign; in 9 cases the coefficient is significant at 99%, in 2 cases at 95% and in another 2 at 90%. Insignificant coefficients were found in typically non-district sectors (chemicals, means of transport other than cars, food, drink and tobacco, rubber and plastic industries).

The territorial *dummies* show a negative sign, but the Central Italy dummy proves weaker (in 8 cases its significance was below 90%, whereas the significance of the location in Southern Italy was 99% all cases).

The 'Southern' dummy has by far the most explicative power (from a minimum of 6.08% to a maximum of 30.24%). The explicative power of the district proxy ranges from 0.11 to 10.45% and, in typical district sectors, between 2 and 3%.

[16] NEG models cannot be considered a great improvement over the basic H-O one. One of its foundations is the aggregate production function (per product in the best of cases), with all the limits meticulously screened by the literature. The 'materials' with which the specific explanations are construed have no original features distinguishing them from the conventional spatial economy and, therefore, with a conceptual artefact which reduces the phenomenon of increasing returns (internal or external to the firm) to the purest school of methodological reductionism of economics (Krugman 1991, pp. 4-7). In a context of the sort, adding the district proxy variable constitutes an operation redolent of syncretism.

those regions whose districts operate at the initial and intermediate stages of the *filiere*.

In conclusion, it must be emphasized that in these two analyses too, as was also observed in the case of the tests on firm productivity, the econometric formulation (which is much more difficult in the case of hypotheses on the industrial districts than for NEG hypotheses) did not fully take into account a fundamental part of the topic.

A further aspect to be born in mind is that the equations estimated only considered the supply-side factors. One of the fundamental contributions among the 'new' theories on international trade (Linder 1961) looks back to a logical framework that had appeared in the writings of William Petty (seventeenth century) and, much more recently, in contributions by Porter (1989) on the "competitive advantage of nations", as also in research on what is now termed horizontal trade. These new theories accord with some recent developments in district analysis, centre mainly on the demand-side (more precisely on the dynamics of human needs) and are particularly well suited to explain the success of Italian district exports. Exports are strongly influenced by the level of sophistication of domestic demand for the particular products (food, clothing, household goods and related machinery) which make up the vast majority of district exports. This level of sophistication acts as an extremely powerful engine, continuously regenerating and fuelling the contextual know-how.

5. The 'so-called' labour market

The third area of verification effectively analysed by the researchers from the Bank of Italy concerns one of the most delicate and complex foundations of the theory of districts: the "so-called labour market".

Two types of analysis have been developed. The first, conducted on INPS (Istituto Nazionale di Previdenza Sociale) database, is strictly dedicated to this market (Casavola, Pellegrini and Romagnano 2000)[17]

[17] From the INPS database regarding employees, a random sample was taken, whose findings matched information from the INPS database regarding firms.

From the sample of employees, 3 other samples were taken. In particular:

and aimed at identifying certain essential features traditionally associated with districts by previous works on this topic. The findings obtained were encouraging.

The average age of the person who starts working (a *proxy* of formal education) in a DF is steadily lower, and associated with a lower wage for the first 2-3 years.

With time, the wage increase is higher for workers and apprentices in the districts (Figures 3-4) since a greater share of apprentices acquire skills. This difference emerges after 6 years' experience and gives rise to a higher overall average wage level.

On the other hand, the average total of labour earning rates is lower because of the lower number of employees (clerical and middle management jobs) and executives. The superior wage average disappears after 15 working years since a significant share of the workers (those with higher incomes) tend to shift to self-employed labour.

In fact, around the age of 36-40, after 15-20 years' working experience, the district workers show on average less seniority both in general and in the firms where they are currently employed. These findings are a clear sign that with the same working experience the mobility of workers among firms is higher and the effect of those workers moving into self-employment can be distinctly felt. The survival rate is lower among the younger firms, whereas those that survive the first few years manage to function for longer periods of time.

Some generalizations can now be made. District workers start working at an earlier age than those in other sectors and locations. In the first years of employment the transmission and accumulation of knowledge compensate for the relatively lower wages received. This is perfectly in line with the points that Becker (1964) has to make on so-called *on-the-job training*. This compensation is decisively enhanced by

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1) a sub-sample of employees who worked in manufacturing firms with fewer than 250 employees between 1986-94;

2) a sub-sample of young new entrants for the period 1986-94;

3) a sub-sample of employees born after 1949 and who appear in the archives from 1975 onwards, and for whom employment and tenure in the current firm from 1989 to 1994 can be established (the INPS database in 1994 consisted of 319,485 firms, of which 131,900 operating in industrial districts). The variables under observation referred to: employment structure; average pay; starting pay; mode of entry in the labour market; relationship between age and working experience, and present *tenure* (i.e. the number of years that the worker has belonged to the same firm); wage increases during employment.

the expectations that derive from working in an environment such as the district, where there is a comparatively high likelihood that the knowledge acquired, more district-specific than firm-specific, will not be wasted in the future.

Once the years of early apprenticeship are over, the average wage level rises sharply, rewarding the higher productivity deriving from the acquired contextual knowledge. After a number of years, the workers who have learnt better skills, gained more experience and acquired organisational and technological expertise have a tendency to start out on their own on a self-employed basis or as small entrepreneurs.

The other research (Omiccioli and Quintiliani 2000) had to do with some essential assumptions about the ownership and managerial structure of firms, together with certain aspects of the labour organisation. The two phenomena were analysed jointly in an attempt to understand how the great mobility of the social and cultural environment and the adaptability and dynamism of the human community, within the industrial districts, is converted into a constant capacity shown by the productive inter-firm organization to change and adapt.

In conclusion, the study set out to show how the labour-market could be an incubator for entrepreneurship. It also sought to relate the peculiar way of managing human resources, thanks to the flexibility with which it deals with the ups and downs of the economic conjuncture. The methodology followed was survey by means of a questionnaire submitted to a sample of DFs and a control sample of NDFs.[18]

The main differences that emerged once again confirmed the hypotheses that could be deduced from early studies on the subject. The proportion of ownership of firms by people residing locally is higher (92% as opposed to 86%) in the districts, as is the proportion of management run directly by the owners, or by people with family

[18] "The study involved 14 of the 199 industrial districts identified by ISTAT. The area of Altamura (provinces of Bari and Matera) was added, although not classified by ISTAT as an autonomous local labour system. It is a 'success story', comparable to the district situations from various points of view. The samples were selected from the database of balance sheets of stock companies from CERVED. In order to give the findings a minimum level of significance, a further limit to the dimensional variable was set: only those firms having a turnover higher than 500 million lira in 1995 were considered" (Iuzzolino 2000, p. 299).

connections or affinities with the owners (94% as opposed to 90%). The dynamics of the shift from a position of subordinate work to managerial activity, in the districts, show that most of the work experience of the people who become entrepreneurs is gained in another firm (64.5% of the cases as opposed to 49.9%). In contrast, the cases studied in the DFs revealed a 26.3% incidence of owners who had previously worked in the same firm as opposed to the NDFs, where 38.7% of the owners came from other firms. In other words, social mobility in the districts is strongly associated with the possibility of "starting up on one's own", whereas elsewhere there is a strong tendency to have "a career within the same firm, which is organised in a rigid hierarchy" (Omiccioli and Quintiliani 2000, p. 342).

Moreover, in the districts, the smaller the firm is, the greater the probability that a *manager* was recruited from another local firm, where he or she worked as an employee. This situation is not found outside the districts, where the bigger the firm is, the more probable will it be that the *managers* come from non-managerial positions within the firm itself.

As far as labour organisation is concerned, adjustments to economic tendencies and conjunctures within the districts take the form of 'external flexibility'. This means that they are implicit in the relationship between the firms and the environment in which they operate. In the case of sudden increases in production, the DFs resort to a greater extent to sub-contractors and cottage industry in 41% of the cases, as opposed to 27% in the NDFs. When the demand falls, however, the district firms reduce their use of these options in 44% of the cases, as opposed to 27% in the NDF. Mobility of the workers from one firm to another can also be considered another, more or less spontaneous external flexibility mechanism. In the DFs, 56% of the more recently hired specialised workers and 44% of those not specialised come from other firms in the same sector. The corresponding percentages outside the districts are 45% and 25%, respectively. The findings for apprentices are similar. Given the abundant supply of workers in the main industry of the district and given the marked tendency of firms to proliferate, these findings may, perhaps, be obvious, and they are indeed approximate, but they remain useful in underlining the importance of external economies of training.

Resort to 'internal flexibility' in terms of the direct relationship between firm and hired labour is far more cautious. If demand falls,

23% of the DFs react by not renewing term contracts, as opposed to 29% of NDFs. In other words, even when there is less stability in the relationship between the employer and the employee, the entrepreneur in a DF is more aware of the investment in human capital and the cost involved when it is lost. This amounts to further confirmation of the crucial importance of acquired *know-how* in explaining the competitive advantages of the districts. The DFs show limited flexibility in this case: professional skills and know-how gained through years of on-the-job experience are held on to dearly.

Other findings support these considerations. Resort to overtime is recorded in 60% of the DFs, as opposed to the 51% of the NDFs. Furthermore, the DFs hire or actively recruit more skilled workers – 22%, as opposed to 18% for the NDFs. The possibility of drawing upon the local labour market is much higher in the districts.

Eighty per cent of the skilled workers hired in the districts in 1997 came from the local labour system, as opposed to 50% in non-district areas. This difference indicates that the DFs resort to a greater extent to contextual knowledge (district specific *know how*). A striking difference also appears in the case of the unskilled workers, 85% of those employed being found *in loco* in the districts, and 71% in the other areas. Furthermore, recruitment of personnel in the districts takes place mainly through informal sources, coinciding with how extensive the family networks are: in 1997 the DFs resorted to these networks to recruit 73% of their apprentices (as opposed to 50% in the NDFs), 64% of their unskilled workers (as opposed to 58%) and 68% of their skilled workers (as opposed to 37%).

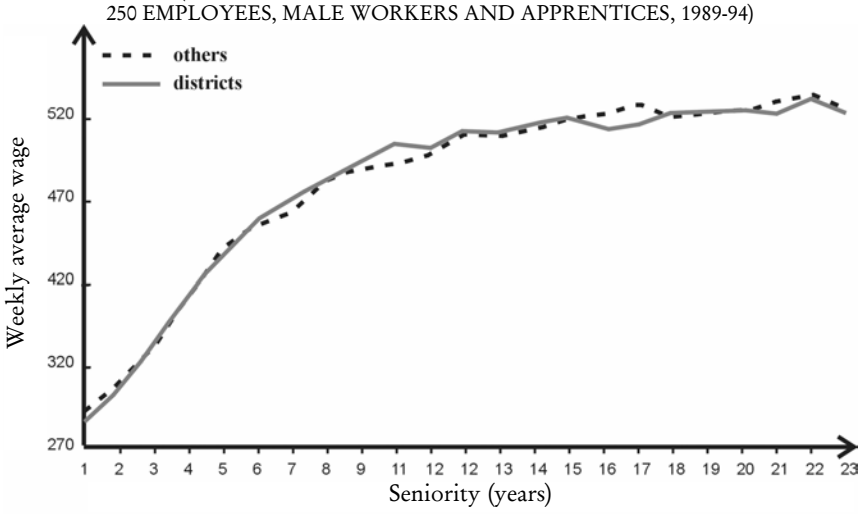
All of this documented information sheds light on many different aspects of the DF issue, prompting various wide-ranging considerations.

The 'labour market' category implies description of job performance as a simple task which has a single dimension. Job performance can be divided into homogeneous classes in relation to the work carried out, for example, by the lathe operator, the milling machine operator, etc. In this perspective each job can be summed up as a price. This was true in the Fordist stage of capitalism, when the peculiarities of each individual job performance were considered an obstacle to the flow of the production process (e.g. the assembly line). Today this interpretation appears a sterile, unacceptable abstraction. The natural reaction of the *mainstream* economists is to multiply the sin-

gle job markets endlessly. Theoretically the marginal substitutability of each single job with other jobs permits the system to work. But this does not change the basic key to understanding, which remains that of considering labour a homogeneous 'good' (within a progressively smaller market), whose price is able to provide all the information needed by the worker shifting from one job to another. This implies that the choice of a job has nothing to do with an individual's personality and does not redefine his or her status within the community. Following the same logical framework from the entrepreneur's point of view, it would be indifferent if one person rather than another carried out a specific task.

FIGURE 3

WEEKLY AVERAGE WAGE AND SENIORITY IN THE DISTRICTS AND OUTSIDE THE DISTRICTS (CENTRAL AND NORTHERN ITALY, FIRMS WITH FEWER THAN 250 EMPLOYEES, MALE WORKERS AND APPRENTICES, 1989-94)



Source: Casavola, Pellegrini and Romagnano (2000a, p. 64).

The so-called labour market is divided into many completely distinct places and many kinds of professional expertise, each of which has its own 'social reward' within the various local societies. This makes wages, the mere price of labour, a far from exhaustive variable (Brusco 1989).

The industrial districts can be described as a sort of 'spiral-shaped' process involving a whole local community and the corre-

sponding productive apparatus, plus the effects of capital coming from outside, in the form of new firms or takeovers of existing local firms. The 'so-called' labour market circuit is made up of actions and feedbacks that go back and forth between the local community and firms, driving each to modify individual behaviour and seek common solutions.

The function of this circuit is not just the *standard* allocating labour. It also has to act as an incubator for entrepreneurship and other professional expertise, which are necessary to fuel the continuous *turnover* in firms characterising the evolutionary dynamism of the districts. If the main mechanism of growth in an industrial district is centred on the continuous division of the productive functions, a parallel mechanism of a social and cultural nature involving the community as a whole must also exist. The industrial districts tend to generate subjects who can, from a technical and organisational point of view, bear the risk of failure. And even when the chances of success have yet to become clear, these subjects can understand the productive needs of a particular sector.

Within the district the so-called labour market is called upon to keep a mechanism of social mobility running, and the competitiveness of the district itself depends upon this. The shift from subordinate jobs to self-employment and entrepreneurship is a natural way of recognising and exploiting the best forces – an optimal allocation of individual growth potential – and is also a precise function of this organisational form.

6. Conclusions

In short, what can we glean from that part of the research[19] carried out by the Research Department of the Bank of Italy examined in detail in this paper? The following three conclusions can be drawn.

1) The district firms show higher productivity than their non-district competitors.[20]

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[19] There is another very interesting part in the Bank of Italy's research referring to the credit market, which we have not analysed.

2) The share of Italian products to which the districts contribute to a larger extent show greater international competitiveness. Or, to put it another way, the industrial districts show greater international competitiveness than other productive areas, especially in the case of certain kinds of products (goods for the person and the house).

3) The so-called 'district labour market' is 'intrinsically' different from apparently similar institutions in other productive areas.

In these concluding notes, we would like to leave field research as well as theoretical considerations open since they are still under way and their free interaction is still useful and desirable. We will focus on three aspects: *a*) the smallest unit of analysis in industrial economics suitable for preserving the link with the theory of value; *b*) the peculiarity of the so-called district labour market; *c*) the introduction of the 'territory' in the analysis of productive phenomena. The insufficiency of economic analysis alone to explain the complexity of the district phenomena will become evident.

It is always difficult to isolate the cost of a specific product (e.g. a new type of fabric with a special colour and pattern) due to the link between internal activities in the firm that manufactures it and the contexts of the same firm (local, technical, etc.). But when production concerns the district firm, these difficulties peak. The network of operations, either directly or indirectly involved in production, is intricately and variably bound together, and the actors in play (firms, families, institutions) are so interdependent that it is impossible to go beyond the 'direct costing' of each single article manufactured and sold by the district.

The plot is difficult to unravel, the conjunctions and connections between cost and the different types of external economies (of organisation, contextual knowledge and learning, concentration, training, transaction, adaptation to the conjuncture) that characterise the district being vastly complex and numerous.

In a long-term perspective, the only production cost that should be taken into account is that borne by the whole district to manufacture all its products. Understanding and isolating the effect of interconnections among district firms, as the Bank of Italy does, is an important step forward from the 'abstractness' of most contemporary

[20] More or less similar finding were arrived at by Nova (2001).

economic theory based on the structure of costs of a generic individual firm. But, in the first place, it weakens perception of the fact that the unit of analysis of the theory of normal long-run price is always a collective entity, either the industrial sector or, as in this case, the district, otherwise there is no normal long-run price. Second, it confuses cases that have distinctly district features with cases where the same features are weak and debatable. Third, it does not distinguish between the districts specialised in products as varied as textiles, shoes and ceramic tiles, jumbling their characteristics together. It is, however, a step forward, opening the way to more refined and complex studies.

Similar observations can be applied to another aspect in the Bank of Italy research, namely a concept of territory assumed not just as a means of geographically trivial distinction (e.g. North-South), but as an entity which can account for economic differences between specific places (the districts) compared with others (non-districts). But not all the consequences that might have been have in fact been drawn from this distinction. The enlightening illustration of the peculiarities of the district labour market is not traced back to an interpretative unity. In our opinion, what is really relevant in the research is the confirmation that within the district there is a significant continuity between the status of the subordinate worker and that of the entrepreneur. Contrary to all the classical, marxist and neo-classical frameworks that establish a clear-cut contrast between those who possess the means of production (the entrepreneurs) and those who do not (the workers), we find a situation in which those who have the capital and wish to exploit it have to allow the worker to gain substantial productive experience. This know-how, or contextual knowledge, which is an essential and "endosomatic" (Georgescu-Roegen 1966) tool of production (human capital), is crucial to the vitality of the production process. The situation is much like that of the medieval craftsman, who trained his apprentice and future competitor.

The studies by the Bank of Italy have 'tested' (see Figure 3) this fundamental perception of the theory of the industrial district. In our opinion, this suggests turning the theoretical approach to the district labour market upside-down to account for the peculiar institution that is the labour market as an incubator of entrepreneurship. This why we call the district labour market a 'so-called labour market'.

We believe that the mechanism of a progressive and self-contained division of district production would be incomprehensible in a productive microcosm like a district, if the so-called labour market only reallocated human productive potential and 'productive capacities', and did not evolve into a sort of incubator of entrepreneurship. The network of local markets, which is the basis for the increase in productivity and innovation in the district, could not function if there were no way to encourage those who feel capable and ready to start independent activity. The propensity to do so permeates local societies and firms in the areas where DFs flourish. Those who feel frustrated by 'working under a boss' must be encouraged to take the risk of moving into self-employment. It is exactly this propensity for taking risks, and occasionally underestimating them, that is essential. It is an integral part of the quest for social reward in a society where possessing important *know-how* and having a good local reputation are believed sufficient to start new businesses. This can come about more quickly in the districts than in industrial areas dominated by large firms. It is a complicated, fragile process that lies mid-way between economic and productive phenomena on the one hand, and social and cultural phenomena on the other. This is the only way the district can socially reproduce itself and renew its competitiveness.

REFERENCES

AMATORI F. and A. COLLI (2001), *Comunità d'imprese. Sistemi locali in Italia tra Ottocento e Novecento*, il Mulino, Bologna.

BAGNASCO A. (1977), *Tre Italie: la problematica territoriale dello sviluppo italiano,* il Mulino, Bologna.

BAGNASCO A. (1999), *Tracce di comunità*, il Mulino, Bologna.

BAGNASCO A. (2003), *Società fuori squadra*, il Mulino, Bologna.

BECATTINI G. (1990), "The Marshallian industrial district as a socio-economic notion", in F. Pyke, G. Becattini and W. Sengenberger eds, *Industrial District and inter-Firm Co-operation in Italy*, International Institute for Labour Studies, Geneva, pp. 37-51.

BECATTINI G. (1998), "Dal distretto industriale alla distrettualizzazione", in G.L. Fontana, a cura di, pp. 65-76.

BECATTINI G. (2000a), *Dal distretto industriale allo sviluppo locale*, Bollati-Boringhieri, Torino.

BECATTINI G. (2000b), *Il distretto industriale*, Rosenberg & Sellier, Torino.

BECATTINI G. (2001), *The Caterpillar and the Butterfly. An Exemplary Case of Development in the Italy of the Industrial Districts*, Le Monnier, Firenze.

BECATTINI G. (2002a), "From Marshall's to the Italian "Industrial Districts". A brief critical reconstruction", in A. Quadrio Curzio and M. Fortis M. eds, *Complexity and Industrial Clusters. Dynamics and Models in Theory and Practice*, Physica-Verlag, Heidelberg, pp. 83-106.

BECATTINI G. (2002b), "Industrial sectors and industrial districts. Tools for industrial analysis", *European Planning Studies*, vol. 10, no. 4, pp. 483-94.

BECATTINI G. and M. BELLANDI (2002), "Mighty Pygmies and feeble Watutsis. Considerations on Italian industry", *Review of Economic Conditions in Italy*, no. 3, pp. 375-405.

BECATTINI G. and E. RULLANI (1996), "Local systems and global connections: the role of knowledge", in F. Cossentino, F. Pyke and W. Sengenberger eds, *Local and Regional Response to Global Pressure: the Case of Italy and its Industrial Districts*, International Institute for Labour Studies, Geneva, pp. 159-74.

BECATTINI G., M. BELLANDI, G. DEI OTTATI and F. SFORZI, a cura di (2001), *Il caleidoscopio dello sviluppo locale. Trasformazioni economiche nell'Italia contemporanea*, Rosenberg & Sellier, Torino.

BECATTINI G., M. BELLANDI, G. DEI OTTATI and F. SFORZI eds (2003), *From Industrial Districts to Local Development. An Itinerary of Research*, Edward Elgar, Cheltenham.

BECKER G. (1964), *Human Capital: a Theoretical and Empirical Analysis, with Special Reference to Education*, 2nd ed., National Bureau of Economic Research, New York.

BELLANDI M. (2003a), "The incentives to decentralized creativity in local systems of small firms", in G. Becattini *et al*. eds, pp. 95-107.

BELLANDI M. (2003b), "On entrepreneurship, region and the constitution of scale and scope economies", in G. Becattini *et al*. eds., pp. 131-56.

BELLANDI M. and F. SFORZI (2003), "Multiple pathways of local development", in G. Becattini *et al*. eds, pp. 227-34.

BRONZINI R. (2000), "Sistemi produttivi locali e commercio estero: un'analisi territoriale delle esportazioni italiane", in L.F. Signorini, a cura di, pp. 101-22.

BRUSCO S. (1989), *Piccole imprese e distretti industriali. Una raccolta di saggi*, Rosenberg & Sellier, Torino.

BRUSCO S. (1999), "The rules of the game in industrial district", in A Grandori ed., *Interfirm Networks: Organization and Industrial Competitiveness*, Routledge, London and New York, pp. 17-40.

CASAVOLA P., G. PELLEGRINI and E. ROMAGNANO (2000), "Imprese e mercato del lavoro nei distretti industriali", in L.F. Signorini, a cura di, pp. 51-66.

CECCHI C. (1992), "Per una definizione di distretto agricolo e distretto agroindustriale", *La Questione Agraria*, n. 46, pp. 81-107.

CECCHI C., R. CIANFERONI and A. PACCIANI (1991), *Economia e politica dell'agricoltura e dell'ambiente*, CEDAM, Padova.

CONTI G. and S. MENGHINELLO (1996), "Territorio e competitività: l'importanza dei sistemi locali per le esportazioni italiane di manufatti. Un'analisi per provincie (1985-1994)", *Rapporto sul Commercio Estero*, Roma, ICE 1995, pp. 286-303.

DARDI M. (1997), "Il fattore locale nell'analisi del distretto industriale", paper presented at the 38th annual meeting of the Società Italiana degli Economisti, 17-18 October, Roma, mimeo.

DEI OTTATI G. (1995), *Tra mercato e comunità: aspetti concettuali e ricerche empiriche sul distretto industriale*, Franco Angeli, Milano.

DEI OTTATI G. (2003a), "The governance of transactions in the industrial district: the "Community Market"", in G. Becattini *et al*. eds, pp. 73-94.

DEI OTTATI G. (2003b), "Trust, interlinking, transactions and credit in the industrial district", in G. Becattini *et al*. eds, pp. 108-30.

FABIANI S., G. PELLEGRINI, E. ROMAGNANO and L.F. SIGNORINI (2000), "L'efficienza delle imprese nei distretti industriali italiani", in L.F. Signorini, a cura di, pp. 21-49.

FINALDI RUSSO P. and P. ROSSI (2000), "Costo e disponibilità del credito per le imprese nei distretti industriali", in L.F. Signorini, a cura di, *Lo sviluppo locale – Un'indagine della Banca d'Italia sui distretti industriali*, Donzelli, Roma, pp. 203-35.

FOLLONI G. and G. GORLA (2001), "Una modellizzazione del distretto industriale e della sua evoluzione", in G. Becattini *et al*., a cura di, pp. 191-223.

FONTANA G.L., a cura di (1998), *Le vie dell'industrializzazione europea. Sistemi a confronto*, il Mulino, Bologna.

FORTIS M. (1996), *Crescita economica e specializzazioni produttive. Sistemi locali e imprese del "made in Italy"*, Vita e Pensiero, Milano.

FUÀ G. and C. ZACCHIA, a cura di (1983), *Industrializzazione senza fratture*, il Mulino, Bologna.

GEORGESCU-ROEGEN N. (1966), *Analytical Economics: Issues and Problems*, Harvard University Press, Cambridge, Mass.

GEORGESCU-ROEGEN N. (1982), *Energia e miti economici*, Bollati-Boringhieri, Torino.

GOLA C. and A. MORI (2000), "Agglomerazione spaziale e performance internazionale", in L.F. Signorini, a cura di, pp. 67-100.

GRASSELLI P. and F. MUSOTTI, a cura di (2002), *Esperienze di sviluppo locale e dinamiche dell'industria manifatturiera umbra*, Franco Angeli, Milano.

GUENZI, A. (1997), "La storia economica e i distretti industriali marshalliani: qualche considerazione su approcci e risultati", in C.M. Belfanti e Maccarelli, a cura di, *Un paradigma per i distretti industriali. Radici storiche, attualità e sfide future*, Grafo, Brescia, pp. 19-30.

IACOPONI L. (1990), "Distretto industriale marshalliano e forme di organizzazione delle imprese in agricoltura", *Rivista di Economia Agraria*, Anno XLV, n. 4, pp. 711-43.

INNOCENTI R, a cura di (1985), *Piccola città, piccola impresa*, Franco Angeli, Milano.

ISTAT (1996), *Rapporto annuale – La situazione del Paese nel 1995*, Roma.

ISTAT (2002), *Le esportazioni dei sistemi locali del lavoro*, Roma.

ISTAT e F. SFORZI (1997), *I sistemi locali del lavoro 1991*, Roma.

IUZZOLINO G. (2000), "L'indagine della Banca d'Italia sui distretti industriali: caratteristiche metodologiche, in L.F. Signorini, a cura di, pp. 299-309.

KRUGMAN P. (1991), *Geography and Trade*, The MIT Press, Cambridge, Mass.

LINDER S.B. (1961), *An Essay on Trade and Transformation*, Almqvist & Viksell, Stockholm.

MARSHALL A. (1919), *Industry and Trade*, Macmillan, London.

MARSHALL A. (1961), *Principles of Economics*, variorum edition edited by C. Guillebaud, Macmillan, London, 2 vols.

MARTIN R. (1999), "Critical survey. The new "geographical turn" in economics: some critical reflections", *Cambridge Journal of Economics*, no. 23, pp. 65-91.

MATHIAS P. (1998), "Riflessioni sul processo d'industrializzazione in Europa", in G.L. Fontana, a cura di, pp. 35-64.

MUSOTTI F. (1997), "Le radici agricolo-rurali dell'industrializzazione diffusa nelle regioni ex-mezzadrili dell'Italia centrale: un'analisi econometria", *Sviluppo Locale*, vol. IV, n. 5, pp. 123-53.

MUSOTTI F. (2001), "Le radici mezzadrili dell'industria leggera", in G. Becattini *et al.*, a cura di, pp. 93-116.

NISTICÒ A. and L. PROSPERETTI (1991), "Produttività, efficienza e progresso tecnico", in G. Marbach, a cura di, *Statistica economica*, Utet, Torino, pp. 175-203.

NOVA A. (2001), "L'economia delle imprese nei distretti italiani: redditività, dominanza e strategie differenziali", *Economia e Politica Industriale*, anno XXVIII, n. 111, pp. 107-43.

OMICCIOLI M. and F. QUINTILIANI (2000), "Assetti imprenditoriali, organizzazione del lavoro e mobilità nei distretti industriali", in L.F. Signorini, a cura di, pp. 339-58.

PANCIERA W. (2000), *Fiducia e affari nella società veneziana del Settecento*, CLEUP, Padova.

PARRI L. (1997), "Risultati di azione umana ma non di progetto umano. I distretti industriali per Hayek e la Scuola austriaca", in C.M. Belfanti e T. Maccabelli, a cura di, pp. 175-90.

PONI C. (1990), "Per la storia del distretto industriale serico di Bologna (Secoli XVI-XIX)", *Quaderni Storici*, n.s. 73, a. XXV, n. 1, pp. 717-34.

PORTER M.E. (1989), *The Competitive Advantage of Nations*, Macmillan, New York.

PROIETTI T. (1996), "Analisi econometrica dell'efficienza tecnica su dati panel", in F. Pennacchi, a cura di, *Successo aziendale – Evoluzione nelle aziende R.I.C.A.*, Istituto nazionale di economia agraria – Istituto di economia e politica agraria, Università degli Studi di Perugia, Quaderno n. 20, Perugia, pp. 370-81.

PYKE F., G. BECATTINI and W. SENGENBERGER eds (1990), *Industrial District and Inter-Firm Co-operation in Italy*, International Institute for Labour Studies, Geneva.

ROMAGNOLI A. (1996), "Struttura assiomatica della teoria dei processi dell'unità tecnica", in A. Romagnoli, a cura di, *Teoria dei processi produttivi*, Giappichelli, Torino, pp. 45-63.

SFORZI F. (1987), "L'identificazione spaziale", in G. Becattini, a cura di, *Mercato e forze locali: il distretto industriale*, il Mulino, Bologna, pp. 143-67.

SFORZI F. (2003), "Local development in the experiences of Italian industrial districts", in G. Becattini *et al*. eds, pp. 157-83.

SIGNORINI L.F. (1994), "Una verifica quantitativa dell'effetto distretto", *Sviluppo Locale*, n. 1, pp. 31-70.

SIGNORINI L.F., a cura di (2000a): *Lo sviluppo locale – Un'indagine della Banca d'Italia sui distretti industriali*, Donzelli, Roma

SIGNORINI L.F. (2000b), "L'"effetto distretto": motivazioni e risultati di un progetto di ricerca – Introduzione", in L.F. Signorini, a cura di, pp. XIII-XL.

STEINDL J. (1945), *Small and Big Business. Economic Problems of the Size of Firms*, Institute of Statistics, Basil Blackwell, Oxford.

TANI P. (1987), "La decomponibilità del processo produttivo", in G. Becattini, a cura di, *Mercato e forze locali. Il distretto industriale*, il Mulino, Bologna, pp. 69-92.

TANI P. (1989), La rappresentazione della tecnologia produttiva nella analisi microeconomica: problemi e recenti tendenze", in S. Zamagni, a cura di, *Le teorie economiche della produzione*, il Mulino, Bologna, pp. 19-49.

TATTARA G. (2001), "L'efficienza dei distretti industriali: una ricerca condotta dal servizio studi della Banca d'Italia", *Economia e società regionale*, n. 4, pp. 114-44.

TESSIERI N. (2001), "Rassegna bibliografica sullo sviluppo locale e sui sistemi locali di piccola e media impresa in Italia", in G. Becattini *et al*., a cura di, pp. 419-77.

TRIGILIA (2002), *Economic Sociology. State, Market and Society in Modern Capitalism*, Blackwell, Oxford.

VARALDO R. and L. FERRUCCI (1997), *Il distretto industriale tra logiche di impresa e logiche di sistema*, Franco Angeli, Milano.

ZAMAGNI V. (1990), *Dalla periferia al centro. La seconda rinascita economica dell'Italia 1861-1990*, il Mulino, Bologna.