TRADE ADVANTAGE OF ITALIAN INDUSTRIAL DISTRICTS: PERSISTENCE AND CHANGE

PLATANIA, Marco*

Abstract
The Italian industrial system is characterized by the presence of small and midsized firms that take advantage of the economics of agglomeration by forming particular local systems, known as industrial districts. These districts represent the backbone of the Italian industrial sector. However, the districts' competitive advantage, which had allowed Italy become a major economic actor, has been slowed by the crisis of the 2000s and by the Great Recession of 2009. This paper focuses on the persistence in and the changes to the trade advantage of the Italian industrial districts.
JEL Classification codes F10, L16, R11, R32
Keywords Industrial district, Lafay Index, Trade advantage

1. Introduction

Events of the last decade, such as the movement of Eastern European countries to market economies, the introduction of the Euro, and the industrial growth of Asian countries, have significantly changed the international competitive context. This new situation has produced strong competitive pressure on firms in industrialized countries, challenging those areas that do not possess adaptive capacity in the short term.

In Italy, the competitiveness crisis of the 2000s, manifested by the increase in the prices of raw materials, food and industrial, and the Great Recession of 2009, put the economies of agglomeration of Industrial Districts (IDs) at risk. These districts are particular local systems that have a large number of medium and small firms that are related to each other through a mix of competition and cooperation within what has been called the "industrial atmosphere" (Becattini, 1989). For a long time, industrial districts were the backbone of the national manufacturing system. Therefore, it is interesting to understand how the industrial districts adapt to economic cycles.

This paper analyses the persistence and the change in the last fifteen years of the trade advantage of the IDs, the core of the Italian manufacturing industry, and whether their degree of international specialization has changed. In particular, analysing a dynamic model of the productive specialization of the IDs, we show that, in the period considered, the international trade model of the manufacturing industry has not changed. Most of the districts have adopted a conservative behaviour, keeping the same level of specialization. Only a small number of cases indicate an increase in productive specialization.

In the first part of the paper, we discuss the Italian model of industrial development and the importance of the Marshallian externalities. In the second part, we introduce the model to analyse the pattern of international specialization (a Lafay model). To conclude, we consider the persistence and the change in the Italian industrial model.

* Marco Platania, University of Catania, Via Biblioteca, 2 - Palazzo Ingrassia - 95124 Catania, Italy. E-mail: marco.platania@unict.it

2. The Italian model of industrial development

The trade structure in Italy is characterized by persistent specialization in traditional low-skilled, labour-intensive sectors (textiles, apparel, leather products, footwear, and furniture). The Italian trade structure differs from that of the other high-income Organization for Economic Co-operation and Development (OECD) countries. This structure has been identified in a large number of empirical studies based on various data sets with different sectorial classification and using different statistical methodologies (Cipollone, 1999; Brasili, et al., 2000; Bugamelli, 2001; Chiarlone, 2001; De Benedictis, 2005; Di Maio and Tamagni, 2008; Amighini et al., 2011).

One explanation for this difference is given by the theory of dynamic scale economies, Marshallian externalities, and agglomeration. This theory is related to both the new economic geography and to the literature on industrial districts (De Benedictis, 2005). According to several studies, the "Italian model" of industrial development corresponds not only to a specific form of organization of the production process but also to the identification of a community with ethical, cultural and social values. Several empirical studies highlighted the qualities of a social and economic structure self-organized as a Marshallian district, particularly the small size and the collective efficiency (Garofoli, 1983; Schmitz, 1995; Becattini, 1989 and 1999; Brusco and Paba, 1997; Signorini 2000), the role of incremental innovations, the role of non-codified knowledge and the weight of historical and social conditions.

With this system of industrial organization, production and productivity, some Italian regions have grown to be among the most productive in the world, especially in the '70s and '80s. Industrial growth has transformed the productive structure of regions such as the Veneto, Emilia Romagna, Tuscany and Marche, affecting even areas with no industry. The production of the districts has diversified over time and the output is sold mainly in foreign countries, particularly wealthy industrialized countries, with an accumulation of substantial shares in the global exchange (Becchetti and Rossi, 2000; Becattini, 2002; Becattini and Dei Ottati, 2006; Brida et al., 2014).

The presence of IDs in international markets began during the economic crisis of the Seventies. The increase in raw material prices, high labour costs caused by social unrest, the growth of public expenditures and the increases in exchange rates established a mechanism of progressive inflation (Brusco and Paba 1997). This inflation caused a monetary policy credit rationing with an increase in interest rates. Large firms operating in capital intensive sectors were the most penalized by this macroeconomic situation; they suffered from the increase in the value of money and the rigidity of the labour market. The organizational structure for divisions adopted by large firms (Sabel, 1982; Piore and Sabel, 1984) was remodelled, and multinationals were divided into independent units.

If large firms suffered from inflation and the consequent increases in the price of money and labour in the Seventies, the industrial districts firms instead managed to avoid debt. Industrial district firms were able to avoid debt because of their size; these firms did not engage in massive investment because they already had capital. In addition, the industrial districts were affected less by the increases in salaries due to the flexibility of the structure of the work. Furthermore, the firms did not specialize in energy intensive

sectors, allowing small firms and districts to overcome the difficulties of rising material prices caused by the oil shock (Mistri, 1998).

The specialization in traditional and low tech sectors, which allowed the establishment of IDs in international markets in the Seventies, caused a crisis beginning in the Nineties. The mature sectors in which the districts are positioned are characterized by a slow dynamic of demand (Iapadre, 2002). In addition, purchasing has decreased in Western Europe and the Middle East, the traditional outlets of the production of the IDs. At the same time, the liberalization of world markets allowed access to European markets for newly industrialized countries (NICs), favoured by low production costs. Since 2001, the Italian districts additionally suffer from the fierce competition from the NICs, in part due to an overvalued euro that increases the price of exports (De Benedictis, 2005).

The macroeconomic scenarios of the 2000 (the crisis of competitiveness) and of 2009 (the Great Recession) put the IDs in a difficult position despite economies of localization and the sharing of social capital. There are several causes of the crisis: the different development paths determined by the external context (such as global competition, technological change) and the internal context (inability to adapt to changing economic conditions) (Zucchella, 2006). Other research connects the deceleration of productivity to the demographic aging of the labour force (the so-called "deficit of competition"); the sectors exposed to international competition cannot "keep up" with foreign competitors (Gurrieri and Lorizio 2002). However, the new international competition challenges the allocative efficiency of district systems. With the introduction of the euro and the industrial growth of Asian countries and in particular China, the international competitive context of most of the products of the Italian districts has changed rapidly. Adding the effects of the delocalization of production favored by new information technologies and the reduction in transport costs, it is easy to understand the competitive pressure that district firms have faced (Dei Ottati, 2009, Platania, 2012).

3. Measuring the trade flows of the IDs

An analysis of international trade of IDs is particularly difficult due to the lack of specific data on the import and export level of each Local Labour System (LLS), the unit of analysis used by the National Institute of Statistics (ISTAT) to identify the IDs[1]. We exclude the ad hoc surveys that cover a limited portion of the territory's or the district's area that are substantially different from those identified by ISTAT. This type of analysis should be conducted on proxy data of the territorial districts. Because data are not available at the ID level, we will conduct our analysis on a provincial level.

In this paper, as in other studies (Bronzini, 2000; De Arcangelis and Ferri 2005), an indicator of the districtualization degree of the province has been developed:

[1] The Local Labour Systems (LLS) are defined based on information about home-to-work commuting from the population census. The LLSs are groups of contiguous municipalities characterized by a certain level of commuting. IDs are identified within LLSs if they satisfy specific requirements about the percentage of manufacturing employees in the LLS compared to the total non-agricultural employment, specialization in one particular manufacturing industry, and the prevalence of firms with fewer than 250 employees. According to the 2001 Industrial Census, the number of districts is 156 (ISTAT, 2005). For the list, see http://dwcis.istat.it/cis/index.htm

$$x_{i=} \frac{\text{number of manufacturing workers in the LLSs in province } i}{\text{total number of manufacturing workers in province } i}$$

The districtualization degree x_i ranges between 0 and 1. The calculations were performed using the ID classification of the LLS in 1991. Thirty seven provinces have values above the mean (0.299), and these provinces are selected as "District Provinces". Table I (in the appendix) shows the provinces included in the study and, according Farabullini and Ferri (2005), their specialization[2]. Having identified the District Provinces, we study the pattern of international specialization. Based on data from the ISTAT, we analyse the import and export flows for the period 1995–2011 by economic activity at the two-digit classification level of ATECO 2007 (Classification of product activity, table II).

The literature suggests many indicators to measure comparative advantage. The Balassa index (1965) is commonly used. The Balassa index is an index of comparative advantage built from the sectorial composition of trade flows recorded in a given period. A major limitation of the Balassa index is that it is only related to exports; determining the degree of specialization using only a trade flow (exports) may deprive the analysis of determining factors (Boffa et al., 2009). A more comprehensive index with more explanatory power was proposed by the French economist Lafay (1992). We use the Lafay index due to several appealing features with respect to alternative measures of specialization: the index allows a more precise analysis of the description of dynamic models of productive specialization (Bugamelli, 2001) than the Balassa index, and it is possible to control for intra-industry trade and business cycle variations.

In this paper, we compute the Lafay Index (LFI) of international specialization for 22 items (see Appendix). We used a modified version of the Lafay index taken from Bugamelli (2001):

$$LFI_j^i = \left(\frac{x_j^i - m_j^i}{x_j^i + m_j^i} - \frac{\sum_{j=1}^{N} (x_j^i - m_j^i)}{\sum_{j=1}^{N} (x_j^i + m_j^i)} \right) \frac{x_j^i + m_j^i}{\sum_{j=1}^{N} (x_j^i + m_j^i)} * 100$$

where

x_j^i = exports of province *i* of a product in economic sector *j* to the rest of the world;

m_j^i = is imports of a product in economic sector *j* from the rest of the world to province *i*;

N= is the number of traded goods

[2] When an LLS belongs to two provinces, all of its workers are included in the district workers of both provinces. For each of the 37 provinces, we count from a minimum of 1 to a maximum of 5 of the 9 identified industrial district specializations: food & beverages; textiles & clothing; leather & footwear; furniture; metals; mechanical engineering; petrochemicals; paper & publishing; gold & musical products.

According to the above formula, the comparative advantage for District Province *i* in the production of economic sector *j* is the deviation of the product *j* normalized trade balance from the overall normalized balanced trade. Thus, the sum of LFI across *j* for any year must by design be equal to zero. Positive values of the LFI imply specialization, and higher values of the LFI imply higher degrees of specialization, with the sector making a bigger contribution to the trade balance. Alternately, negative values imply a reliance on imports (Alessandrini et al., 2007; Caselli and Zaghini, 2004). The index considers trade flows for each sector and for the entire sector. The index can then establish whether a country is relatively specialized in a given field (in relation to all other economic sectors), even when the country in question is generally a net importer, provided that the percentage difference between imports and exports is lower than the national difference (Boffa et al., 2009).

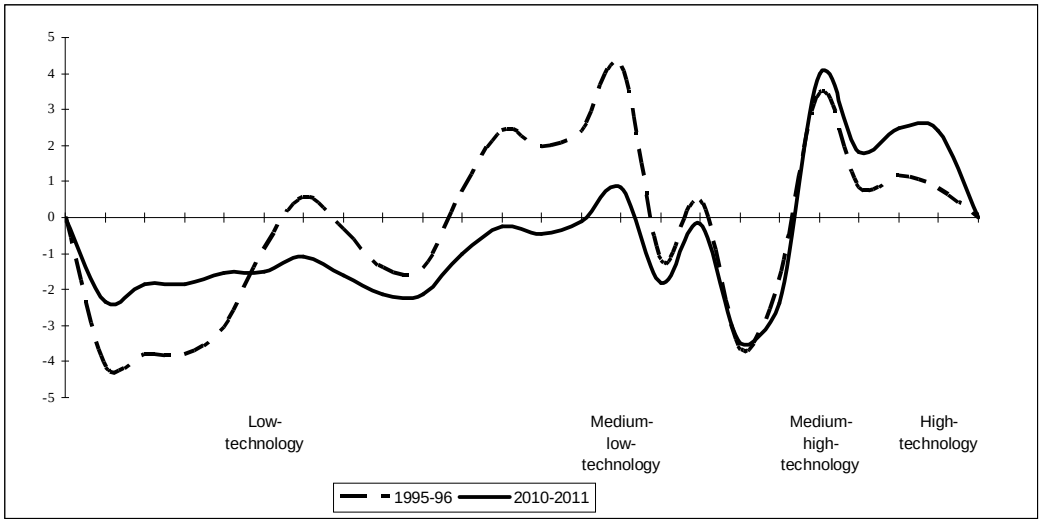
Table III shows information regarding the shape of the overall distribution of the Lafay index. In particular, the table shows the economic sectors with the maximum and minimum index value in the two periods of observation (1995-96/2010-11), the weight of the first five items and the Spearman's correlation coefficient. From the table, we can make some observations. First, the distribution of comparative advantage among Italian provinces differs widely across regions, and this difference is similar across the two periods. The minimum and maximum value of the Lafay index during the 15 years between the two periods of analysis isn't regular. Indeed, the maximum and minimum values of the economic sectors remain the same, regardless of the economic sector and the territory.

The relative weight of the first five items between 1995-96 and 2010-11 differs across regions. In the northeast, the centre and the south, the values are decreasing. Alternately, the northwest is more balanced. The other indicator shown in Table III is the Spearman's correlation coefficient; a high correlation indicates that the province's comparative advantages measured by the Lafay Index has changed very little between 1995/96 and 2010/11, while a low value indicates considerable change. Table III shows that international specialization has been stable in the Italian district provinces; 67% of the provinces have a coefficient higher than 0.7. However, the analysis of the Spearman rank correlation does not provide information on the determinants of a high or low degree of persistence. That is, it does not explain which sectors are contributing that persistence or to that change. Therefore, we need further investigation.

The next figure presents an alternative, synthetic analysis of the specialization model. The horizontal axis represents the twenty-two divisions of the manufacturing industry following the Index of Intensity of Research and Development according to the Technology and Industry Scoreboard 2009 OECD Science (OECD, 2009). The line represents the Lafay index, obtained from the cumulative value of the index (Bugamelli, 2001). The cumulative Lafay index is ascending (descending) for the groups with an advantage (disadvantage).

By looking at the shape of the two curves for each period, we see that only the sectors that are between the medium low technology and the medium high technology have not experienced change. The graph reveals that district provinces have lost their competitive advantage in the medium low technology sectors, while improving the trade specialization in the high technology sectors.

Fig. 1 - Lafay index of District Provinces (ordered for Technology and Industry Scoreboard)



4. The dynamics of international specialization of IDs

In this section, we explore the persistence and the change in the patterns of international specialization of the IDs and whether their degree of international specialization has increased or decreased. We apply a methodology widely used for international trade data (Amendola et al., 1992; Cantwell, 1989; Pavitt, 1989; Cantwell and Iammarino, 2001; Zaghini, 2003; Caselli and Zaghini, 2004; Guerrieri and Iammarino, 2006). In the first step, we evaluate whether the District Provinces have increased their level of specialization. We run the following ordinary least squares regression:

$$LFI_{2010-2011_i} = \alpha + \beta LFI_{1995-1996_i} + \varepsilon_i \qquad i = 1, \ldots..37$$

where $LFI_{2010\text{-}2011}$ and $LFI_{1995\text{-}1996}$ are the Lafay indices in the second period (the dependent variable) and first period (the independent variable) of our sample, respectively. The variables α and β are the standard linear regression parameters and ε is the residual term. The interpretation of the regression is straightforward. The variables on both sides of the equation have a mean of zero, so the estimate of α should also have a zero value. The value of β captures the changes over time in the pattern of specialization. If $\beta>1$, then the degree to which the District Province has specialized (not specialized) in certain industries has increased (decreased). A coefficient $0<\beta<1$ denotes that, on average, specialization has remained the same, even as the Lafay index improved for the items with low initial values and worsened for those with high initial values. If $\beta = 0$, then there is no relationship between the pattern of specialization in the two periods.

The regression analysis does not allow us to evaluate the change in the dispersion of the comparative advantage distribution. For this reason, we need a second step, in which we apply the following equation:

$$\frac{VAR\sigma^{end}}{VAR\sigma^{start}} = \frac{\beta^2}{R^2};$$

where the numerator and denominator are, respectively, the variances of the endogenous and exogenous variables, and R^2 is the coefficient of determination (the square of the correlation coefficient). This ratio provides some information on the changes that have occurred in the dispersion of the distribution of comparative advantages. If $\beta=R$, then the dispersion of the distribution in unchanged. When $\beta>R$, the degree of specialization has increased. Lastly, if $\beta<R$, the degree of specialization has decreased. R can be considered as a measure of the mobility of the products along the distribution. A high value of R indicates that the relative positions of the individual items have remained almost unchanged, indicating that they possess low mobility (Caselli and Zaghini, 2004).

The joint analysis of the regression and mobility effects indicates the changes of the distribution of the comparative advantages over time in the District Provinces. Table 1 shows the two effects; the effects divide the District Province into three groups. The first group has a value of $\beta>1$ and a value of $\beta>R$. There are only two provinces in this group, Siena and Prato.

Tab. 1 - Dynamics of international specialization for District Provinces

	$\beta > R$	$\beta < R$	$\beta = 0$
$\beta = 0$	-	-	-
$\beta>1$	Siena, Prato		-
$0 < \beta < 1$	Biella (**), Verbania(***), Sondrio, Treviso, Piacenza, Pistoia, Pesaro, Ascoli Piceno,	Novara, Varese, Como, Bergamo, Brescia, Cremona, Lodi, Lecco, Verona, Vicenza, Padova, Udine, Parma, Reggio Emilia, Modena, Ravenna, Forlì, Mantova, Lucca, Pisa, Arezzo, Perugia, Ancona, Macerata, Viterbo, Teramo	-
(*) Significant at the .01 level			
(**) Significant at the .05 level			
(***) Significant at the .1 level			
The OLS regression for the District Province of Rovigo is not significant			

There is a particular pattern in this group: there is an increase in specialization over our study period, so we can affirm that the district provinces have kept their competitive advantage. At the same time, these two provinces have an increase in the dispersion, showing high mobility.

A second group of Districts Provinces has a value of $0<\beta<1$. For them, on average, the structure of specialization has remained the same, even if the Lafay index improved for the items with low initial values and worsened for those with high initial values. These nine provinces additionally have a value of $\beta>R$, highlighting, as in the previous group, an increase in mobility. Finally, the third group contains most of the province districts

observed (26). Even in this group, which has a value of $0<\beta<1$, specialization has remained the same. However, this group has a value of $\beta<R$, which means that the specialization model is not more dispersed and that the relative positions of the individual items have remained almost unchanged. Thus, this group has low mobility.

5. Conclusions

The importance of the Italian district system has been clarified in previous research: for a long time, these districts characterized Italian trade performance. Along with changes in the international economic scenario, the specialization model has changed. For example, the increase in the international competition has influenced the adoption of the delocalization processes. Production activities transferred to emerging markets due to their many advantages, such as abundant labour at a limited cost. These choices, however, possibly created a deverticalization process with deep changes to the identity of the firms, to the primary characteristics of production and labour and, in general, to the district model.

This study examined the processes of change in the international trade of industrial districts. Analysis of the determination coefficient and the mobility effect indicate that for the most of the district provinces, the specialization model remained stable. Only a small number of cases behaved differently, being characterized by the high level of mobility of some the economic sectors and a high increase in the level of specialization. These district provinces have kept their competitive advantage, and it is interesting to note that these cases correspond to the most ancient districts in Italy and are specialized in the traditional sectors of "Made in Italy", such as textiles and clothing or leather and footwear.

In conclusion, the districts' ability to survive in the international market will depend on their ability to adapt. Survival requires investment and innovation to change business models and to change skills. Alternately, a greater degree of openness in the international markets in combination with changes in production methods could threaten external economies of agglomeration. The risk is that the districts could begin to disband, which could affect the development of the local system and the survival of the communities.

References

Alessandrini, M., Fattouh, B. and Scaramozzino, P. (2007). The changing pattern of foreign trade specialization in Indian manufacturing, *Oxford Review of Economic Policy*, vol. 23, no. 2, 270–91.

Amendola, G., Guerrieri, P. and Padoan, P.C. (1992). International Patterns of Technological Accumulation and Trade, *Journal of International and Comparative Economics*, vol 1, no. 1, 173-97.

Amighini, A., Leone, M. and Rabellotti, R. (2011). Persistence versus Change in the International Specialization Pattern of Italy: How Much Does the 'District Effect' Matter?, *Regional Studies*, vol. 45, no. 3, 381-401.

Balassa, B. (1965). Trade Liberalization and 'Revealed' Comparative Advantage, *The Manchester School*, vol. 33, no. 2, 99-123.

Becattini, G. (1989). *Modelli locali di sviluppo*, Bologna, Il Mulino.

Becattini, G. (1999). *Distretti industriali e made in Italy. Le basi socioculturali del nostro sviluppo*, Torino, Boringhieri.

Becattini, G. (2002). I sistemi locali nello sviluppo economico italiano e nella sua interpretazione, in: Becattini, G., Sforzi, F. (Eds.), *Lezioni sullo sviluppo locale*, Torino, Rosemberg & Sellier.

Becattini, G. and Dei Ottati, G. (2006). The performance of Italian industrial districts and large enterprise areas in the 1990s, *European and Planning Studies*, vol. 14, no. 8, 1139–62.

Becchetti, L. and Rossi, S.P.S. (2000). The Positive Effect of Industrial District on the Export Performance of Italian Firms, *Review of Industrial Organization*, vol. 16, no. 1, 53-68.

Boffa, F., Bolatto, S. and Zanetti, G. (2009). Specializzazione produttiva e crescita: un'analisi mediante indicatori, *CERIS Working Paper*, 1.

Brasili, A., Epifani, P. and Helg, R. (2000). On the dynamics of trade patterns, *De Economist*, vol. 148, no. 2, 233–57.

Brida, J. G., Garrido, N., & Mureddu, F. (2014). Club Performance Dynamics At Italian Regional Level, *Regional and Sectoral Economic Studies*, Euro-American Association of Economic Development, vol. 14(1), pages 47-68.

Bronzini, R. (2000). Sistemi produttivi locali e commercio estero: un'analisi territoriale delle esportazioni italiane, in Signorini, L.F., (Eds.), *Lo sviluppo locale. Un'indagine della Banca d'Italia sui distretti industriali*, Roma, Donzelli.

Brusco, S. and Paba, S. (1997). Per una storia dei distretti industriali italiani dal secondo dopoguerra agli anni novanta, in Barca, F., *Storia del capitalismo italiano dal dopoguerra ad oggi*, Roma, Donzelli Editore.

Bugamelli, M. (2001). Il modello di specializzazione internazionale dell'area dell'euro e dei principali paesi europei: omogeneità e convergenze, *Temi di discussione* 402. Banca d'Italia.

Cantwell, J. (1989). *Technological Innovation and Multinational Corporations*, Oxford, Blackwell Publisher.

Cantwell, J. A. and Iammarino, S. (2001). EU regions and multinational corporations: change, stability and strengthening of technological comparative advantages, *Industrial and Corporate Change*, vol. 10, no. 4, 1007–1037.

Caselli, P. and Zaghini, A. (2004). Il Modello di specializzazione internazionale dell'Argentina, *Studi e Note di Economia*, no. 1, 55-82.

Chiarlone, S. (2001). Evidence of product differentiation and relative quality in Italian trade, *Rivista italiana di economia*, no. 2, 147–68.

Cipollone, P. (1999). I vantaggi comparati dell'Italia. Gli effetti sull'occupazione, *Rivista di Politica Economica*, no. 6, 69–109.

De Arcangelis, G. and Ferri, G. (2005). The Specialization of the Districts: From Typical Final Goods to Machinery for Making Them?, in: Banca d'Italia, *Local Economies and Internationalization in Italy*, Banca d'Italia, Roma.

De Benedictis, L. (2005). Three decades of Italian comparative advantages, *World Economy*, vol. 29, no. 11, 1679–709.

Dei Ottati, G. (2009). Distretti industriali italiani e doppia sfida cinese, *QA – Rivista dell'Associazione Rossi-Doria*, no. 1, 123-42.

Di Maio, M. and Tamagni, F. (2008). The evolution of world export sophistication and the Italian trade anomaly, *Rivista di Politica Economica*, vol. 98, no. 1, 135–74.

Farabullini, F. and Ferri, G. (2005). Linking Italy's Banking and Industry in Eastern Europe: Industrial District Outsourcing and Bank Fdi, in: Banca d'Italia, *Local Economies and Internationalization in Italy*, Roma, Banca d'Italia.

Garofoli, G. (1983). Sviluppo regionale e ristrutturazione industriale: il modello italiano degli anni '70, *Rassegna economica*. Vol. 47, no. 6, 1263-295.

Guerrieri, P. and Iammarino, S. (2006). The rise of 'Many Mezzogiorni': an empirical assessment of the internal differentiation of Italian southern regions, *European Urban and Regional Studies*, vol. 13, no. 2, 167–78.

Gurrieri, A.R. and Lorizio, M. (2002). *Distretti industriali, progresso tecnico e crescita economica*, Dynamis Quaderni.

Iapadre, P. L. (2002). Distretti industriali, specializzazione internazionale e quote di mercato delle esportazioni italiane, *Sviluppo locale*, vol. 9, no. 21, 67-88.

ISTAT, (2005). *Distretti industriali e sistemi locali del lavoro 2001*, Roma, ISTAT.

ISTAT, (2010). *Coeweb - Statistiche del commercio estero*. Avalaible at http://www.coeweb.istat.it/.

Lafay, G. (1992). The Measurement of Revealed Comparative Advantages, in: Dagenais, M.G., Muet, P.A., (Eds.), *International Trade Modeling*, London, Chapman and Hill.

Mistri, M. (1998). *Saggi su internazionalizzazione, piccola impresa, economie locali*, Padova, CEDAM.

Pavitt, K.L.R. (1989). International Patterns of Technological Accumulation, in: Hood, N., Vahlne, J.E., (Eds.), *Strategies in Global Competition*, London, Croom Helm Publisher.

Piore, M.J. and Sabel, C.F. (1984). *The second industrial divide*, New York, Basic Books.

Platania, M. (2012). Agglomerazione industriale, integrazione verticale e specializzazione produttiva. Verifiche empiriche delle ipotesi marshalliane, *l'Industria. Rivista di economia e politica industrial*, Vol. 33, no. 2, 305-25.

Sabel, C. (1982). *Work and Politics. The Division of Labor in Industry*, Cambridge, Cambridge University Press.

Schmitz, H. (1995). Collective efficiency: growth path for small-scale industry, *Journal of Development Studies*, vol. 31, no. 4, 529-66.

Signorini, L. F. (2000) (Eds.). *Lo sviluppo locale. Un'indagine della Banca d'Italia sui distretti industriali*, Roma, Meridiana libri – Donzelli.

Zaghini, A. (2003). Trade Advantages and Specialization Dynamics in Accession Countries, *European Central Bank*, Working Paper 249.

Zucchella, A. (2006). Local Cluster Dynamics: Trajectories of Mature Industrial Districts Between Decline and Multiple Embeddedness, *Journal of Institutional Economics*, vol. 2, no. 1, 21–44.

Appendix

Tab. I - Provinces with a high degree district intensity (District Provinces) and their specialization

Province	District intensity	Sector of specialization				
		1	2	3	4	5
Ascoli Piceno	1.00	Textiles & clothing	Leather & footwear			
Lecco	1.00	Mechanical engineering	Food & beverage	Textiles & clothing		
Prato	1.00	Textiles & clothing				
Padova	0.99	Mechanical engineering	Textiles & clothing	Furniture		
Pistoia	0.99	Textiles & clothing	Leather & footwear	Mechanical engineering		
Treviso	0.98	Leather & footwear	Textiles & clothing	Furniture	Mechanical engineering	
Reggio Emilia	0.98	Mechanical engineering	Furniture	Textiles & clothing		
Modena	0.96	Mechanical engineering	Textiles & clothing	Furniture		
Como	0.95	Textiles & clothing	Furniture	Mechanical engineering	Petrochemicals	Food & beverage
Cremona	0.95	Food & beverage	Mechanical engineering	Textiles & clothing	Furniture	Metals
Biella	0.94	Textiles & clothing				
Pesaro	0.94	Textiles & clothing	Furniture			
Vicenza	0.93	Textiles & clothing	Gold & musical products	Paper & publishing	Furniture	
Teramo	0.93	Textiles & clothing	Furniture			
Brescia	0.87	Textiles & clothing	Mechanical engineering	Metals	Petrochemicals	
Parma	0.86	Food & beverage				
Bergamo	0.82	Petrochemicals	Mechanical engineering	Textiles & clothing		
Macerata	0.77	Textiles & clothing	Furniture	Leather & footwear	Gold & musical products	
Lucca	0.75	Leather & footwear	Paper & publishing	Furniture		
Lodi	0.74	Mechanical engineering	Petrochemicals			
Varese	0.73	Textiles & clothing	Petrochemicals			
Udine	0.73	Furniture	Mechanical engineering			
Mantova	0.71	Textiles & clothing	Food & beverage	Furniture	Mechanical engineering	
Arezzo	0.70	Textiles & clothing	Gold & musical products	Furniture	Paper & publishing	
Ravenna	0.62	Food & beverage				
Forlì	0.59	Furniture	Textiles & clothing	Paper & publishing	Leather & footwear	
Ancona	0.59	Leather & footwear	Textiles & clothing	Gold & musical products	Food & beverage	
Rovigo	0.54	Textiles & clothing				
Novara	0.53	Mechanical engineering	Textiles & clothing			
Siena	0.47	Furniture	Food & beverage	Leather & footwear		
Perugia	0.41	Textiles & clothing	Paper & publishing	Furniture		
Verbania	0.40	Mechanical engineering				
Verona	0.37	Furniture	Textiles &	Mechanical	Leather &	

			clothing	engineering	footwear	
Sondrio	0.35	Food & beverage	Textiles & clothing			
Viterbo	0.34	Furniture				
Piacenza	0.33	Mechanical engineering	Food & beverage			
Pisa	0.32	Leather & footwear				
Source: our adaptation from Farabullini and Ferri (2005)						

Tab. II - Economic activity, at the two digit classification level of ATECO 2007 (Classification of product activity)

CA10- Manufacture of food products
CA11- Manufacture of beverages
CA12- Manufacture of tobacco products
CB13- Manufacture of textiles
CB14- Manufacture of wearing apparel
CB15- Manufacture of leather and related products
CC16- Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
CC17- Manufacture of paper and paper products
CC18- Printing and reproduction of recorded media
CD19- Manufacture of coke and refined petroleum products
CE20- Manufacture of chemicals and chemical products
CF21- Manufacture of basic pharmaceutical products and pharmaceutical preparations
CG22- Manufacture of rubber and plastic products
CG23- Manufacture of other non-metallic mineral products
CH24- Manufacture of basic metals
CH25- Manufacture of fabricated metal products, except machinery and equipment
CI26- Manufacture of computer, electronic and optical products
CJ27- Manufacture of electrical equipment
CK28- Manufacture of machinery and equipment n.e.c.
CL29- Manufacture of motor vehicles, trailers and semi-trailers
CL30- Manufacture of other transport equipment
CM31- Manufacture of furniture
CM32- Other manufacturing

Tab. III – District provinces: The value of the Lafay Index and Spearman's rank correlation coefficient, 1995/96-2010/11 (continued)

Area	Region	Province	Lafay Index 1995/96 sector with min and max val.	Relative weight of the top 5 items of 1995/96	Lafay Index 2010/11 sector with min and max val.	Relative weight of the top 5 items of 2010/11	Spearman's correlation coefficient
South	Abruzzo	Teramo	CA10 CM31	17.93	CE20 CL29	15.68	0.60**

** = Correlation is significant at the 0.01 level (2-tailed).

Tab. III – District province: The value of the Lafay Index and Spearman's rank correlation coefficient, 1995/96-2010/11

Area	Region	Province	Lafay Index 1995/96 sector with min and max val.	Relative weight of the top 5 items of 1995/96	Lafay Index 2010/11 sector with min and max val.	Relative weight of the top 5 items of 2010/11	Spearman's correlation coefficient
North west	Piemonte	Biella	CE20 CI26	8.72	CE20 CB13	13.96	0.28
		Novara	CE20 CK28	14.63	CE20 CK28	15.57	0.71**
		Verbano	CH24 CH25	11.39	CA10 CK28	21.97	0.53**
	Lombardia	Bergamo	CE20 CK28	14.22	CE20 CK28	13.10	0.88**
		Brescia	CH24 CH25	15.34	CH24 CK28	15.81	0.84**
		Como	CE20 CB13	14.36	CE20 CM31	10.67	0.73**
		Cremona	CA10 CK28	16.01	CH24 CK28	7.65	0.43**
		Lecco	CH24 CH25	15.91	CL29 CH25	15.32	0.78**
		Lodi	CA10 CK28	19.32	CA10 CJ27	9.26	0.59**
		Mantova	CH24 CK28	21.56	CH24 CK28	11.28	0.80**
		Sondrio	CA10 CH25	15.21	CA10 CH25	19.14	0.85**
		Varese	CE20 CK28	14.04	CE20 CL30	14.51	0.66**
North-East	Veneto	Padova	CH24 CK28	16.04	CI26 CK28	15.50	0.72**
		Rovigo	CE20 CB14	9.78	CI26 CK28	12.08	0.68**
		Treviso	CE20 CM31	12.96	CB14 CM31	15.39	0.79**
		Verona	CL29 CG23	24.39	CL29 CK28	18.27	0.87**
		Vicenza	CH24 CM32	20.47	CH24 CK28	12.59	0.93**
	Friuli	Udine	CH24 CM31	19.96	CH24 CK28	18.16	0.77**

Tab. III – District provinces: The value of the Lafay Index and Spearman's rank correlation coefficient, 1995/96-2010/11 (continued)

Area	Region	Province	Lafay Index 1995/96 sector with min and max val.	Relative weight of the top 5 items of 1995/96	Lafay Index 2010/11 sector with min and max val.	Relative weight of the top 5 items of 2010/11	Spearman's correlation coefficient
	Emilia Romagna	Forlì	CA10 CM31	17.39	CA10 CK28	16.01	0.70**
		Modena	CA10 CG23	17.29	CA10 CG23	15.42	0.79**
		Parma	CL29 CK28	20.67	CL29 CK28	18.32	0.86**
		Piacenza	CH24 CK28	14.63	CM31 CK28	16.24	0.19
		Ravenna	CD19 CK28	17.85	CA10 CJ27	14.94	0.85**
		Reggio Emilia	CA10 CK28	19.85	CE20 CK28	13.71	0.88**
Centre	Lazio	Viterbo	CA10 CG23	26.80	CI26 CG23	20.85	0.52**
	Marche	Ancona	CC17 CJ27	19.42	CI26 CK28	15.84	0.90**
		Ascoli Piceno	CA10 CB15	17.93	CE20 CF21	19.50	0.82**
		Macerata	CE20 CB15	12.51	CI26 CB15	12.34	0.77**
		Pesaro	CH24 CM31	14.99	CH24 CK28	17.83	0.85**
	Toscana	Arezzo	CH24 CM32	37.49	CH24 CM32	12.48	0.67**
		Lucca	CC17 CB15	16.50	CC17 CL30	16.13	0.70**
		Pisa	CA10 CB15	25.69	CA10 CB15	19.63	0.85**
		Pistoia	CA10 CM31	16.63	CA10 CM31	14.65	0.76**
		Prato	CE20 CB14	7.72	CL29 CB13	24.42	0.48**
		Siena	CC16 CA11	12.38	CA10 CA11	19.36	0.68**
	Umbria	Perugia	CA10 CB14	19.67	CA10 CK28	13.73	0.81**