Persistence versus change in the international specialization pattern of Italy: how much does the 'district effect' matter?

Rabellotti, Roberta; Amighini, Alessia; Leone, Marinella

PERSISTENCE VS. CHANGE IN THE INTERNATIONAL SPECIALIZATION PATTERN OF ITALY: HOW MUCH DOES THE 'DISTRICT EFFECT' MATTER?

Journal:	*Regional Studies*
Manuscript ID:	CRES-2008-0107.R2
Manuscript Type:	Main Section
JEL codes:	F10 - General < F1 - Trade < F - International Economics, R10 - General < R1 - General Regional Economics < R - Urban, Rural, and Regional Economics
Keywords:	Intra-regional differentiation, Export specialization dynamics, Industrial districts, Italy

PERSISTENCE VS. CHANGE IN THE INTERNATIONAL SPECIALIZATION PATTERN OF ITALY: HOW MUCH DOES THE 'DISTRICT EFFECT' MATTER?

Alessia AMIGHINI*, Marinella LEONE** and Roberta RABELLOTTI*

*Department of Economics and Quantitative Methods , Università del Piemonte Orientale, via Perrone 18, 28100 Novara, Italy
E-mail: Alessia.amighini@eco.unipmn.it, roberta.rabellotti@eco.unipmn.it
**Department of Economics, University of Sussex, Falmer, Brighton BN1 9SN, UK
E-mail: M.A.Leone@sussex.ac.uk

(Received May 2008: in revised form October 2009)

ABSTRACT

This paper investigates the evolution of specialization patterns for the Italian provinces over the period 1995-2005 by analysing the dynamics of the sectoral distribution in the Balassa index of revealed comparative advantages. The results show that underlying a relatively stable distribution of national comparative advantages over time, there are wide variations in local performance: only a few provinces demonstrate any stability in their specialization over the last decade, with the majority showing decreased specialization. We find a higher *average* degree of persistence for provinces with districts, but no systematic differences between provinces with or without industrial districts. District provinces show wide variation, with a few concentrating on their past comparative strengths, but many diversifying.

Keywords: Intra-regional differentiation, Export specialization dynamics, Industrial districts, Italy

JEL classifications**:** F10 , R10

1 INTRODUCTION

Italy is losing ground in the global market. Italian exports accounted for about 490 US$ billions in 2007, representing 3.5 % of world trade compared to 4.5 % in 1998 and 5 % in 1990; accordingly, the country has gone down in the ranking of major world exporters, from the 6th position in the mid-1990s to the 7th position in 2007.[1] This reduction in the export share is particularly significant because it has occurred during a period of continuous growth in world trade, showing that Italy is indeed experiencing some difficulties in terms of international competitiveness.

The literature has extensively investigated the reasons behind Italy's recent disappointing international performance and there is generally wide agreement that the Italian specialization pattern is one of the main responsible for this slowdown. In contrast to most advanced countries, Italy has a specialization model that has been persistent over time and is based mainly on the production and export of highly labor-intensive goods, which are the type of goods that suffer most in contexts of increasing international competition from labor-abundant emerging economies. Moreover, a large share of Italian exports of labor intensive goods comes from industrial districts (IDs),[2] which are peculiarly organized as geographical concentrations of small and medium scale firms specialized in one particular sector. Recently, IDs have been at the centre of the economic debate. Some scholars have insisted that IDs and their small manufacturing firms are responsible for the inability of the Italian manufacturing system to respond to the challenges of globalization (NARDOZZI, 2004; ONIDA, 2004). Instead, others have argued that in recent years firms in IDs have shown better than average performance (BECATTINI and DEI OTTATI, 2006), also finding a robust positive relationship between IDs and export performance (BAGELLA et al., 1998; BECCHETTI and ROSSI, 2000). Moreover, there is a growing number of contributions showing that districts are highly heterogeneous, with marked structural and behavioural differences, which influences their export performance (MARIOTTI et al., 2008). Accordingly, several industrial

districts are undertaking deep transformations of their sectoral and product specializations, with some of them abandoning earlier areas of specialism (ISTAT, 2002; RABELLOTTI *et al.*, 2008).

In general, it is difficult to reconcile the empirical evidence available at the local level with studies that mainly rely on aggregated trade data at country level to explain the declining national competitiveness and unfavourable international specialization. In this paper, we address the gap between these two different strands of literature by analyzing the evolution of local patterns of international specialization in the Italian provinces (NUTS3) over the period 1995 to 2005.

The aim of the paper is twofold. First, following a methodology widely adopted in the trade literature (DE BENEDICTIS and TAMBERI, 2001), we examine the dynamics of the sectoral distribution in the Balassa index of revealed comparative advantage (RCA), investigating whether and to what extent local patterns of export specialization have been stable over time. Our results show that only a few provinces provide evidence of stability in their patterns of specialization over the decade studied, while the majority have become less specialized. This suggests that the evidence of persistence provided by many national level studies is obscuring significant and divergent trends at the local level. Morevover, in provinces with districts we find a higher *average* degree of persistence but no systematic differences between provinces with or without industrial districts.

Second, we aim to contribute at the ongoing debate on the Italian international specialization exploring whether the more persistent international specialization patterns in district provinces than in non-district provinces can be attributed to the fact that district sectors themselves are more persistent. In other words, we check whether the 'district effect' is a major determinant of the stickiness of the Italian trade patterns. The empirical analysis shows that in provinces with industrial districts specialized in leather and footwear, textiles and clothing, machinery and equipment and furniture and home accessories there is a variety of behaviours and a few of provinces where these sectors are responsible for the persistence of the international specialization patterns.

The paper is organized as follows. Section 2 reviews the recent empirical literature on the relative

persistence of the structure of Italian comparative advantages over time. Section 3 presents the empirical results: 3.1 describes the data and discusses some descriptive statistics; 3.2 examines the stability of local patterns of export specialization; 3.3 explores the contribution of selected sectors to the persistence of patterns of international specialization in provinces with districts and identifies a variety of behaviours. Section 4 summarizes the main results and concludes with some implications for further research.

2 PERSISTENCE AND CHANGE IN THE INTERNATIONAL SPECIALIZATION PATTERN OF ITALY

The debate on the structure of Italian exports, its evolution, causes and implications over time, has generated a vast empirical literature which was recently reviewed by DE BENEDICTIS (2005). As ONIDA (1999) forcibly points out, there is general agreement that the trade stucture in Italy is atypical compared to the other high-income OECD countries, in terms of its persistent specialization in traditional low-skilled labour-intensive sectors such as textiles, apparel, leather products, footwear and furniture. This persistence has been identified in a number of empirical studies based on various datasets, with different sectoral classification and level of aggregation, over varying time spans and using different statistical methodologies (BUGAMELLI, 2001; CEC, 1999; CEPII, 1998; CHIARLONE, 2001; CIPOLLONE, 1999; DE BENEDICTIS, 2005; DI MAIO and TAMAGNI, 2008; HELG, EPIFANI and BRASILI, 2000).

Two major concerns about the anomaly of the Italian model of specialization have been expressed. The first is related to the risk that the Italian manufacturing industry is being overexposed to competition from low cost producers, especially those in emerging labor-abundant economies; the second is related to the risk that Italy is lagging behind other industrialized countries in terms of the production and export of more dynamic goods such as high tech and ICT products. As a result – so the argument goes – Italy has become locked into an unfavorable specialization model, which is

leading to a decline in international performance.

To explain the persistence of the Italian pattern of specialization over time, we can refer to standard international trade theory which predicts that specialization patterns largely reflect factor endowments. DE BENEDICTIS (2005) makes the point that since the mid-1950s Italy has embarked on a process of capital accumulation and is no longer a labour-abundant country; therefore, according to the Heckscher-Ohlin theorem, it should not be specialized in labour-intensive sectors. However, in terms of its human capital endowment, Italy differs with respect to the other high-income OECD countries. If we take the simplest measure of educational attainment – number of years of education of the working age population - Italy has lagged behind the other high-income OECD countries since at least the 1960s and this lag was increasing up to the 1990s. Moreover, the share of high-skilled labour over the total labour force is less than half that of France and Germany, and a meager third of that for the United States. Hence, Italy's export composition can be explained in terms of its poorer human capital endowment compared to the other major industrialized countries (FAINI and SAPIR, 2005).

Another strand of the literature explains the persistence of the Italian structure of comparative advantages in terms of dynamic economies of scale (KRUGMAN, 1987) and Marshallian externalities (DE BENEDICTIS and PADOAN, 1999; EPIFANI, 1999). According to this view, Italy has become more and more efficient in those sectors in which it specialized 50 years ago, and has remained locked-in its initial comparative advantage. The reason for learning-by-doing being so effective and dynamic scale economies being strong enough to nullify the effect of a change in factor proportions, is due to the diffusion of clusters of small specialized firms able to exploit Marshallian externalities (BECATTINI, 1989; BECCHETTI et a., 2007; RABELLOTTI, 1997; SIGNORINI, 2000).

In contrast to this view of IDs as being one of the reasons for the persistence of the Italian pattern of international specialization, there are some recent studies that provide evidence of changes in sector and within sector specialization in IDs. DE ARCANGELIS and FERRI (2005) show that there is a

tendency for a shift from production of final goods to production of the machinery needed to produce them. Based on provincial level trade data for the period 1991-2001, they show that provinces with high concentration of IDs and high degree of delocalization of production, have shifted their specialization from final goods to capital goods within the same production segment.

Changes in specialization are also taking place within sectors due to quality upgrading of products and functional upgrading of production processes. On quality upgrading, SCHOTT (2004) suggests that there is growing empirical evidence of countries specializing in different quality ranges of the same products. Changing relative factor endowments imply changes in within product specialization, i.e. a reallocation of comparative advantage *within* the same industry. For industrialized countries producing traditional labour-intensive goods, exposure to increasing competition from labour-abundant countries results in increasing vertical differentiation of the domestic industry with a progressive shift from lower quality (low market) to higher quality (up market) varieties of the same products (BUGAMELLI, 2001; CHIARLONE, 2001).

Accordingly, DE NARDIS and PENSA (2004) show that traditional Italian exports have not been displaced by the same goods from less developed countries, because of a vertical shift within sectors toward more advanced segments of production characterized by better quality. They assess the intensity of competition from foreign competitors in traditional industries such as textiles, clothing, leather goods, ceramics and wooden furniture, evaluating the market power of Italian exporting firms in their major destination markets. Their conclusion is that during the 1980s and 1990s Italian exporters were not generally suffering from foreign competition, not even competition from low cost countries, because they were able to apply higher mark ups over marginal costs, for most of the products analyzed and for most destination markets.

In terms of the functional upgrading of production processes, several case studies have documented the delocalization (at home or abroad) of lower value added activities (mainly the unskilled labour intensive stages of production) and the increasing outsourcing of non-core competencies by firms (AMIGHINI and RABELLOTTI, 2006; BALDONE *et al.*, 2002; TATTARA *et al.*, 2006). The

delocalisation of labour-intensive activities abroad can progressively shift the export composition of sectors producing consumption goods from final products to intermediate products, sent to foreign subcontractors that undertake the final stages of production. Thus, apparent weakening specialization in final goods may be accompanied by increased specialization in intermediate goods, within the same sectors (RABELLOTTI, 2004). Also, a by-product of certain final stages being delocalized abroad, may be an increase in exports of the specialized machinery needed to produce those final goods.

By disaggregated analysis of RCA at province level in the period 1995-2005, we empirically investigate the dynamics in the Italian patterns of international specialization. To our knowledge, very few studies have analyzed the dynamics of international specialization in Italy at the local level (VIESTI, 1995; CONTI and MENGHINELLO, 1995), with the notable exception of a recent study by GUERRIERI and IAMMARINO (2007), which adopts a similar methodology to the one in this paper but focuses only on the Italian Mezzogiorno.

In what follows we address three main research questions: first, we investigate the stability of local patterns of export specialization since the mid-1990s; second, we look at whether there are differences between provinces with and without districts (Sections 3.1 and 3.2); third, focusing on selected provinces with districts we analyse whether district sectors have contributed more than non-district sectors to the degree of the persistence of trade specialization in each province, and identify some main trajectories in terms of specialization dynamics (Section 3.3).

3 THE EMPIRICAL ANALYSIS ON THE ITALIAN PROVINCES

3.1 Data and descriptive statistics

Based on 103 Italian provinces[3] and data from the National Institute of Statistics (ISTAT), we analyse export flows for the period 1995-2005 by economic activity, at the 5-digit CPAteco (*Classificazione delle Attività Produttive*) classification level. Data on world exports are taken from

the UN Comtrade database (United Nations Commodity Trade Statistics Database) at the 5 digit Standard International Trade Classification (SITC Rev. 3) level, converted into the CPAteco classification.

With regard to export data, the provincial level is the most disaggregated available and therefore we have to introduce a proxy for analysing industrial districts.[4] This is done by distinguishing between provinces where there is at least one ID as identified by ISTAT (60 provinces henceforth referred to as *district* provinces)[5] and provinces that have no districts (43 referred to as *non-district* provinces). As it is well known, districts are more concentrated in the Centre and North of Italy where 73% of all provinces are classified as *district* provinces while in the South the provinces with at least one district are only 31% of the total.[6]

As a measure of international specialization we use the Balassa index of Revealed Comparative Advantages (RCA) (BALASSA, 1965), widely applied in the trade literature (DE BENEDICTIS and TAMBERI, 2001):

$$RCAij=(Xij/Xi)/(Xwj/Xw) \quad (1)$$

where the numerator is the percentage share of sector *j* in the exports of province *i*, and the denominator is the percentage share of sector *j* in world exports. RCA ranges from 0 to $+\infty$ and has a demarcation value of 1. Values below 1 indicate that province *i* has a comparative disadvantage (CD) in sector *j*; values above 1 indicate that province *i* has a comparative advantage (CA) in sector *j*. Sectors with a RCA above 1 are considered to be specialized sectors; those below 1 are non-specialized sectors.

Two widely used descriptive statistics from the RCA index are the median of the RCA distribution and the Spearman's rank correlation coefficient. As suggested by DE BENEDICTIS and TAMBERI 2003), unlike the arithmetic mean[7] of the RCA distribution, the median of sectoral RCA has an immediate meaning: a low median means that a country has a large share of CD sectors; a high median means that a country has a large share of CA sectors. Therefore, the median of the RCA measures the overall level of international specialization; in other words, a country with a high

median has a concentrated structure of exports in CA sectors, whereas a country with a low median has a concentrated structure of exports in CD sectors.[8] In addition, analyzing the median allows both static and dynamic considerations: a median increasing over time means that a country has increased the share of its CA sectors while a median decreasing over time means that a country has increased the share of its CD sectors.

At first glance, the distribution of comparative advantage among Italian provinces differs widely across regions (Table 1). In general, the median of the RCA distribution is lower in the South than in the Centre or North of the country, with this difference remaining similar across the period considered.[9] Therefore, it seems that provinces in the South have much more concentrated export structures (i.e. a lower share of CA sectors) than those in the Centre and the North, which makes their local economic systems more vulnerable to external demand conditions and the vagaries of international markets (KRUGMAN, 1993).[10] The two island regions, Sicily and Sardinia, and also Calabria stand out as regions with extremely concentrated export structures.

It is interesting that, on average, district provinces have a higher median, i.e. a higher share of CA sectors, than non-district provinces, suggesting that the former are characterized by a broader pattern of export international trade specialization than provinces without districts. Moreover, among district provinces there is a persistent geographical difference because those in the South have a lower median than district provinces in the Centre and in the North and therefore they have a lower number of CA sectors than the other district provinces.[11]

As regards the dynamics of the overall distribution, the gap between the Centre and the South of the country is smaller in 2005 compared to 1995, in the sense that on average the share of CA sectors has increased in the South and decreased in the Centre, making the two areas slightly less diverse in terms of export concentration; or, in other words, we can say that the South has converged towards the national average and is less strikingly different from the rest of the country than in the mid-1990s. The opposite trend can be observed in the North of the country, where provinces in the East, which had a slightly higher median compared to the West in 1995, have moved further away.

< *Table 1* about here >

The other indicator in Table 1 is the Spearman rank correlation coefficient: a high ranked correlation indicates that the province's comparative advantages has changed very little over 1995-2005, while a low value indicates considerable change. Table 1 shows that international specialization has been very stable in the Central and Northern regions: 95 % of the provinces in the North-East and 70 % of the provinces in the Centre and the North-West have a coefficient higher than 0.7, compared with only 19 % of the provinces in the South. Also, in each macro area district provinces on average show a higher value correlation than non-district provinces, meaning that on average the RCA distribution in those provinces has lower sector mobility. However, analysis of the Spearman rank correlation does not provide information on the determinants of a higher or lower degree of persistence. In other words, it does not explain which sectors are contributing the most to that persistence, and in particular it does not explain whether district sectors actually contribute to the overall degree of persistence of the provinces in which they are located *more* than other sectors do. Hence, the presumption that because district provinces have more persistent trade patterns, industrial districts must therefore be responsible for the overall persistence of the Italian model of international specialization, needs further investigation. In the following sections we analyse the dynamics of the overall international specialization of Italian provinces using a methodology that allows us to test for the degree of persistence of each province across sectors, as well as the contribution of each sector to the degree of persistence of a province as a whole.

3.2 The dynamics of overall international specialization

In this section we explore the persistence of the patterns of international specialization of Italian provinces and whether their overall degree of international specialization has increased or decreased, by exploiting a methodology widely applied to international trade data (AMENDOLA *et al.*, 1992; CANTWELL, 1991, 1993; CANTWELL and IAMMARINO, 2001; DE BENEDICTIS,

2005; GUERRIERI and IAMMARINO, 2007).

We test whether the international specialization patterns of Italian provinces have remained fairly stable over time, using a simple transformation of the RCA, i.e. the symmetric RCA (RSCA), defined as follows:

$$RSCAij=(RCAij-1)/(RCAij+1). \quad (2)$$

The RSCA has a lower- and upper-bounded distribution ranging from –1 to +1 with a demarcation value of 0. Negative values indicate comparative disadvantages and positive values indicate comparative advantages.

As our dependent variable is lower- and upper-bounded and therefore OLS estimates could be biased, a censored model (i.e. a tobit model) has also been estimated (BREEN, 1996). Given that in most cases the latter estimates[12] are similar to the OLS ones, both with regard to sign and magnitude, our analysis is based on the OLS model.

We test the following equation for each Italian province:

$$RSCAij_t=\alpha i + \beta i\ RSCAij_{t-k} + \varepsilon ij \quad (3)$$

with the error term εij independent of $RSCAij_{t-k}$ and where i= 1, ..., 103 are the Italian provinces, j= 1, ..., 92 are the 5-digits manufacturing sectors, t is the final year (2005) and t-k is the initial year (1995).[13]

The estimated βs from the regressions above provide information on the dynamics of the overall international specialization of the Italian provinces between 1995 and 2005. The null hypothesis tests for the absence of linear path-dependence ($\beta=0$) against the alternative hypothesis of linear persistence of international specialization patterns ($\beta\neq0$) in the structure of sectoral specialization, i.e. whether on average (non-) specialized sectors remain (non-) specialized. Therefore, the following cases are possible:

- $\beta=1$ denotes stability in the initial international specialization pattern;
- $\beta>1$ denotes a structure of international specialization in which on average the initial pattern

is strengthened (i.e. higher comparative advantages and disadvantages);

- $0<\beta<1$ denotes a structure of international specialization which on average is weakening, i.e. lower comparative advantages and disadvantages. Hence, the structure of international specialization tends on average 'towards the mean' (HART, 1976);
- $\beta<0$ denotes an inversion of the initial pattern of international specialization.

Analysing the estimated βs does not provide sufficient information to conclude that the degree of international specialization has either increased or decreased.[14] The regression model in combination with the estimates of β, allows us to test for changes in the *degree of trade specialization* in each province: i.e. to calculate the variance in the RCA index by measuring the degree of dispersion of the distribution around the mean.

If the variance of the RCA index is:

$$\sigma_t^2 = \beta^2 \sigma_{t-k}^2 + \sigma_\varepsilon^2 \tag{4}$$

the square of the correlation coefficient ρ^2 can be written as:

$$\rho^2 = 1 - \frac{\sigma_\varepsilon^2}{\sigma_t^2}, \tag{5}$$

and from equations (4) and (5) above, we obtain that:

$$\frac{\sigma_t^2}{\sigma_{t-k}^2} = \frac{\beta^2}{\rho^2} \tag{6}$$

which is equal to:

$$\frac{\sigma_t}{\sigma_{t-k}} = \frac{|\beta|}{|\rho|} \tag{7}$$

Equation (7) suggests that a change in the degree of international specialization depends on the comparison between the estimated β and the estimated correlation coefficient ρ .[15] More specifically, ρ is a measure of the mobility of sectors up or down the RCA distribution (CANTWELL 1991 and 1993; LAURSEN, 2002). A high estimated ρ indicates that the overall structure of sectoral specialization is rather stable with the relative positions of sectors almost

unchanged (low mobility). A low estimated ρ implies that the ranking of sectors has changed significantly (high mobility).

It follows that $\beta=\rho$ indicates that the degree of international specialization is the same, and the dispersion of the distribution is unchanged; $\beta>\rho$ implies an increase in the variance of the RCA distribution, hence a higher degree of international specialization and $\beta<\rho$ denotes a decrease in the degree of international specialization.

Combining the results for the βs and the β/ρ, we can distinguish three cases:

- If $\beta>1$ this necessarily implies that $\beta>\rho$, as ρ is never higher than 1. This means that provinces that strengthen their initial international specialization patterns over time, also face an increase in the dispersion of their specialization patterns., i.e. specialized sectors and non-specialized sectors are increasingly further apart;[16]
- If $0<\beta<1$ and $\beta>\rho$, this means a higher dispersion in the international specialization structure. However, the increasing dispersion is not due to higher comparative advantages or disadvantages (on the contrary, it acts to weaken some of the initial comparative strengths as $0<\beta<1$), but rather to high mobility across sectors. Therefore, the net effect is an *increase* in the degree of international specialization;
- If $0<\beta<1$ and $\beta<\rho$ this implies a weakening of the international specialization structure combined with low mobility across sectors, resulting in lower dispersion (i.e. a decrease in the overall degree of international specialization).

Table 2 summarizes the results of the analysis of the dynamics of overall international specialization in the Italian provinces.[17] First, we consider the signs of the β coefficients, which are all positive, therefore excluding the case of inversion of the initial international specialization pattern. Second, there are no βs higher than 1, implying that no province has significantly strengthened its initial international specialization in the period under consideration. Third, a small group of provinces (16%), almost all district provinces, has an estimated β not significantly different from 1, which is evidence of a stable international specialization pattern. For the remaining

provinces, the value of the estimated coefficient is $0<\beta<1$ denoting a weakening of their international specialization structure over time. Also, within this very large group, 20% of provinces, mainly from the South, have a β coefficient that is not significantly different from 0.5, or significantly lower than 0.5.

<*Table 2* about here>

By comparing the regression coefficients (β) with the estimated correlation coefficients (ρ) we can divide the provinces in two groups. The first column in Table 2 includes 44% of the provinces, with weakening initial international specialization and an overall *decrease* in degree of international specialization. In other words, the loss of initial comparative strength in these provinces is not being accompanied by significant changes in RSCA distribution. The second column includes 56% of the provinces that are facing an overall *increase* in degree of international specialization; thus, although they are also losing their initial comparative advantage they are experiencing positive changes in the sector rankings within the RSCA distribution.

Overall, these findings, which are based on disaggregated provincial data, present a much more differentiated picture with respect to some of the existing country level empirical evidence (DE BENEDICTIS, 2005). Our analysis shows that the majority of Italian provinces are *not* concentrating their structure of international specialization but are experiencing a process of despecialization.[18] Also, there is large group of provinces whose sectoral composition of comparative advantage has changed, towards a process of diversification of the international specialization patterns. Moreover, despite there being no systematic difference between provinces with and without IDs, district provinces show slightly more persistence in terms of international specialization. This result is in line with DE BENEDICTIS (2005), who through an aggregated estimation shows that the presence of IDs is positively related to the degree of persistence of RCA.

Nevertheless, although district *provinces* may have slightly more persistent international specialization patterns than non-district provinces, this persistence is not necessarily related to the sectors of specialization of the districts. Indeed, as we showed in Section 3.1, district provinces

have *consistently less* concentrated export structures than non-district provinces, i.e. they have a higher share of CA sectors. Therefore, the evidence pointing to persistence in trade patterns being positively correlated to the presence of industrial districts does not necessarily imply that district sectors are more persistent than others. In the next section, which focuses on some selected provinces with at least one ID, we test for the contribution of each sector to the degree of persistence in trade patterns.

3.3 How much do district sectors contribute to persistent international specialisation?

In this section we explore whether the more persistent international specialization patterns in district provinces than in non-district provinces can be attributed to the fact that district sectors themselves are more persistent. In other words, we check whether the 'district effect' is a major determinant of the stickiness of the Italian trade patterns.

We focus on those provinces with, according to ISTAT,[19] at least one ID specialized in the one of the following sectors: textiles and clothing, leather and footwear, machinery and equipment and furniture and home accessories, which are considered as the most representative of the Italian international specialization. In the selected 56 district provinces we test the contribution of each (district and non-district) sector (see Table A1) to the overall degree of persistence of the trade patterns for the whole province. To do this, we introduce sectoral dummies into the model specification previously tested (2). As in the previous estimation, we compare estimates from the OLS model with those from a censored model; the latter provides similar coefficients for most of the sectors, with the exceptions of few coefficients becoming significant only at the 10% level.

Table 3 presents the results for the OLS model with the coefficients of the dummies for the district sectors in columns 5 to 9 being positive and statistically significant for 25% of the provinces considered. This means that in this group of provinces, district sectors do significantly contribute to the persistence of the international specialization pattern. It is worth noticing that these provinces

share a common feature, all of them being provinces with very well known and old established industrial districts, such as Prato (PO), Biella (BI), Vercelli (VC), Vicenza (VI) and Treviso (TV) specialized in the textile and clothing industry; Pordenone (PN) and Lecco (LC) specialized in the machinery industry; Ascoli Piceno (AP), Ancona (AN), Treviso (TV) and Bari (BA) specialized in the leather and footwear industry. From a geographical point of view, it is also worth stressing that in two regions with a strong presence of IDs, Marche and Veneto, respectively three provinces out of four (PU, AN and AP) and four provinces out of seven (TV, PD, VI, and PN) belong to this group. This suggests that provinces with long-established districts, especially in the textile, clothing and footwear sectors, have more persistent export patterns than the rest. Therefore, we can conclude that there is indeed a 'district effect', which is particularly important in some cases, but still limited to a minority of provinces.

Besides, within this group which is characterized by positive and statistically significant coefficients of the district sectors, in 10 out of 14 provinces the coefficients of the non-district sectors are also positive and statistically significant, meaning that the degree of persistence is explained by the presence of a variety (both district and non-district) sectors. Table 2 shows that in the decade studied all these provinces, except Vicenza (VI) and Ascoli Piceno (AP), register high mobility across sectors, having therefore diversifyed their export patterns.

In another small group of provinces (12%) the coefficients of the dummies for the district sectors are significant and negative, meaning that the overall degree of persistence is negatively affected by these sectors, particularly in five provinces with districts specialized in furniture/homeware related goods.

In the remaining majority of provinces (61%), none of the dummies for the sectoral districts is significant meaning that the persistence in trade patterns in these provinces is not explained by the presence of district sectors. Within this group, we can distinguish a few interesting patterns. There is a group of 6 provinces in which non-district sectors are positively and significantly contributing to the degree of persistence. In a larger group of provinces (37% of the total) the dummies for other

non-district sectors are statistically significant but with a negative sign, meaning that they are contributing to the weakening of the international specialization structure. It should be noted that in this group six out of eleven provinces are located in the South of Italy. Finally, there is a group of seven provinces where none of the sectors significantly contributes to the overall degree of persistance.

<*Table 3* about here>

Overall, our findings provide a rather different picture from the highly persistent international specialization model that is often advocated in the literature and a more nuanced depiction of IDs as the main culprit for that. Our analysis shows that in a few long-established district provinces, district sectors are significantly contributing to the persistence of international specialization patterns during the ten years from 1995 to 2005. Therefore, if there is any 'district effect', it should be considered as a *sector* effect in *some* selected district provinces, where some of the long-established, best-known and stronger on international markets IDs are located. In these provinces, export patterns tend to be more persistent than elsewhere and the district sectors do contribute significantly to that high persistence. However, it is not merely the presence of IDs in a province that implies a higher stickiness in the export pattern.

4. CONCLUSIONS

This paper analyses the dynamics of local specialization patterns in Italy over a period of ten years. The findings contribute to the existing empirical analysis showing that underlying the widely documented relative persistence of international specialization at national level, there are significant and divergent local trends. The main results can be summarized as follows. Only a few provinces have maintained stable international specialization patterns in the decade examined; most show evidence of weakened specialization. A large proportion of these provinces is also characterized by relative high mobility of sectors within the RCA distribution; thus, during the period under analysis

they have undergone a process of diversification of their initial international specialization patterns. International specialization in what we define as district provinces, has o*n average* been slightly more persistent than in non-district provinces, and district provinces are also characterized by a broader pattern of international trade specialization than non-district provinces. However, there are no systematic differences between provinces with or without IDs.

To investigate the contribution of district and non-district sectors to the degree of persistence of provinces, we restricted our analysis to those provinces with IDs specialized in the leather and footwear, textile and clothing, machinery and equipment and furniture and homewear accessories industries. There is a certain number of provinces where we find a concentration of comparative strengths in the district sectors, which is often accompanied by high mobility across sectors. Moreover, in many district provinces, there is a relevant contribution of non-district sectors to the overall degree of persistence of their international specialization pattern.

Overall, this paper contributes to the understanding of the Italian patterns of international specialization through the findings from a disaggregated analysis that takes account of local specificities. These findings show that the presence of IDs contributes to explaining the degree of persistence in a certain number of provinces, and that other determinants, such as non-district sectors and geographical macro areas play a role.

There are some caveats to the interpretation of our results in terms of the stability of international specialization, specialization trends and export performance, which are not related in any systematic way. International specialization is not *per se* conducive to positive export performance, in the same way that despecialization *per se* is not necessarily detrimental to competitiveness. In fact, these processes can be positive or negative in terms of economic development and growth, depending on competitiveness in the years considered. Moreover, if a province is more or less specialized over time, and has a more or less stable trade pattern, this does have clear-cut consequences in terms of competitiveness and growth. The economic consequences of international specialization and despecialization are an empirical issue. International specialization can contribute positively to

economic development only if it occurs in sectors that are dynamic in terms of export growth, i.e. sectors with relatively high income elasticities of demand. Specialization can be detrimental to economic development when a province tries to develop or strengthen its comparative advantages in sectors with low and/or declining demand. To make an analogy with the development literature, this situation could be defined as 'immiserising specialization'. On the other hand, despecialization does not necessarily imply that a province is on the way to decline; instead, if a province loses part of its initial comparative advantage, despecialization can be positive for long-term economic development, provided that the net impact on export growth is positive. Some very recent readings of the Italian empirical evidence incline to interpret the diversification and despecialization of IDs as positive signals of long term economic performance and international competitiveness. Empirical analysis of the impact of specialization on export performance and economic growth would be an interesting issue for future research.

Also interesting for further research is the possible introduction in the empirical analysis of 'neighbouring' effects among territorial units due to positive or negative externalities and spillover effects. The existence of such neighbouring effects among the Italian local production systems and industrial districts has been documented in a number of studies (ARBIA, 2001; BASILE and MANTUANO, 2008; PELLEGRINI, 2005) showing that the *sectoral* specialization of a given territorial unit as well as its dynamics over time are likely to be affected by the *sectoral* specialization of neighbouring areas and *vice versa*. A related, but quite different issue is the role of neighbouring effect on *international* specialisation patterns. Both from a theoretical and an empirical point of view, the channels through which spatial externalities would exert their effects on trade patterns are an interesting issue for further research.

Acknowledgements

The authors wish to thank Barbara Chizzolini, Barry Reilly and two anonymous referees who provided comments and support at various stages of the work. Drafts of the paper were presented at the ERSA Annual Conference in 2007 and at the Italian Trade Study Group Workshop held in Lecce in 2008. Financing from PRIN 2005 “Fragmentation and Local Development: Theoretical Approaches and Policy Implications” is gratefully acknowledged. The usual disclaimer applies.

REFERENCES

AMENDOLA G., GUERRIERI P. and PADOAN P.C. (1992) International pattern of technological accumulation and trade, Journal of International and Comparative Economics, 1, 1, 173-197.

AMIGHINI A. and RABELLOTTI R. (2006) The effects of globalization on Italian industrial districts: Evidence from the footwear sector, European Planning Studies, 14, 4, 485-502;

ARBIA G. (2001) The Role of Spatial Effects in the Empirical Analysis of Regional Concentration, International Journal of Geographical Systems, 3, 271-281.

BAGELLA M., BECCHETTI L. and SACCHI S. (1998) The positive link between geographical agglomeration and export intensity: the engine of Italian endogenous growth?, Economic Notes, 1, 1-34.

BALASSA B. (1965) Trade Liberalisation and Revealed Comparative Advantage, Manchester School of Economics and Social Studies, 33, 99-123.

BALDONE S., SDOGATI T. and TAJOLI L. (2002) Moving to the central-eastern Europe: fragmentation of production and competitiveness of the European textile and apparel industry, Rivista di Politica Economica, 1, 209-246.

BASILE R. and MANTUANO M. (2008) La concentrazione geografica dell'industria in Italia: 1971-2001, Scienze Regionali, Italian Journal of Regional Science, 3.

BECATTINI G. and DEI OTTATI G. (2006) The performance of Italian industrial districts and large enterprise areas in the 1990s, European and Planning Studies, 14, 8, 1139-1162.

BECATTINI, G. (1989) Sector and/or districts: some remarks on the conceptual foundation of industrial economies, in Goodman, E., Bamford, J., Saynor, P. (eds.), Small Firms and Industrial Districts in Italy, Routledge, London, 123-35.

BECCHETTI L. and ROSSI S. (2000) The positive effect of industrial district on export performance of Italian firms, Review of Industrial Organization, 16, 53-68.

BECCHETTI L., DE PANIZZA A. and OROPALLO A. (2007) Role of Industrial District

Externalities in Export and Value-added Performance: Evidence from the Population of Italian Firms, Regional Studies, 41, 5, 601-621.

BREEN R. (1996) Regression Models. Censored, Sample-Selected, or Truncated Data, Sage, Thousand Oaks.

BRIANT A., COMBES P-P. and LAFOURCADE M. (2008) Dots to boxes: do the size and shape of geographical units jeopardize economic geography estimation?, CEPR Discussion Paper, n. 2928.

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

CANTWELL J.A. (1991) Historical trends in international patterns of technological innovation, in J. Foreman-Peck (ed), New perspectives on the late Victorian economy, Cambridge University Press, Cambridge.

CANTWELL J.A. (1993) Corporate technological specialization in international industries, in M.C. CASSON and J. CREEEDY (eds), Industrial Concentration and Economic Inequality, Edward Elgar, Aldershot.

CANTWELL J.A. and IAMMARINO S. (2001) EU Regions and Multinational Corporations: Change, Stability and Strengthening of Technological Comparative Advantages, Industrial and Corporate Change, 10, 4, 1007-1037.

CEC - Commission of European Economies (1999) Italy's slow growth in the 1990s: Facts, explanations and prospects, European Economy, Reports and Studies, 5.

CEPII - Centre d'études prospectives et d'informations internationales (1998) Competitivité des nations, Economica, Paris .

CHIARLONE S. (2001) Evidence of product differentiation and relative quality in Italian trade, Rivista italiana di economia, 2, August, 147-168.

CIPOLLONE P. (1999) I vantaggi comparati dell'Italia. Gli effetti sull'occupazione, Rivista di

Politica Economica, 6, 69-109.

CONTI G. and S. MENGHINELLO (1995) Territorio e competitività: l'importanza dei sistemi locali per le esportazioni nazionali di manufatti. Un'analisi per province (1985-94), in ICE, Rapporto sul Commercio Estero 1995, Istituto Nazionale per il Commercio Estero, Rome.

DE ARCANGELIS G. and FERRI G. (2005) La specializzazione dei distretti: dai beni finali ai macchinari del made in Italy?, in L.F. Signorini and M. Omiccioli, Sistemi locali e competizione globale, Il Mulino, Bologna.

DE BENEDICTIS L. (2005) Three decades of Italian comparative advantages, The World Economy, 28, 11, 1679-1709.

DE BENEDICTIS L. and PADOAN P. C. (1999) Dynamic scale economies, specialization, and the cost of the single currency, International Journal of Development Planning Literature, 14, 4, 549-560.

DE BENEDICTIS L. and TAMBERI M. (2001) A Note on the Balassa Index of Revealed Comparative Advantage, SSRN Working Papers, 289602.

DE BENEDICTIS L. and TAMBERI M. (2003) Overall specialization empirics: Techniques and Applications, Open Economies Review, 15, 4, 323-346.

DE NARDIS S. and PENSA C. (2004) How intense is competition in international markets of traditional goods? The case of Italian Exporters', ISAE Working Papers, 44.

DI MAIO M. and TAMAGNI F. (2008) The Evolution of World Export Sophistication and the Italian Trade Anomaly, Rivista di Politica Economica, January-February, *forthcoming*.

EPIFANI P. (1999) Sulle determinanti del modello di specializzazione internazionale dell'Italia, Politica Economica, 15, 2, 195-224.

FAINI R. and SAPIR A. (2005) Un modello obsoleto? Crescita e specializzazione dell'economia italiana, in Oltre il declino, a cura di T. Boeri, R. Faini, A. Ichino, G. Pisauro e C. Scarpa, Il Mulino, Bologna.

GREENE W.H. (2003) Econometric Analysis, 5th Edition, Prentice Hall, Upper Saddle River, New

Jersey.

GUERRIERI P. and IAMMARINO S. (2007) Dynamics of Export Specialization in the Regions of the Italian Mezzogiorno: Persistence and Change, Regional Studies, 41, 7, 933-948.

HART P.E. (1976) The Dynamics of Earnings, 1963-1973, The Economic Journal, 86, 343, 551-565.

HELG R. EPIFANI P. and BRASILI A. (2000) On the Dynamics of Trade Patterns, De Economist, 148, 2, 233-258.

ISTAT (2002) Le esportazioni dai sistemi locali del lavoro, in Argomenti, 22, Istituto Nazionale di Statistica, Rome.

ISTAT (2005) Struttura e competitività del sistema delle imprese industriali e dei servizi, Istituto Nazionale di Statistica, Rome.

KRUGMAN P. (1993) Lessons of Massachusetts for EMU, in TORRES F. and GIAVAZZI F. (eds), Adjustment and growth in the European Monetary Union, Cambridge Mass., Cambridge University Press.

KRUGMAN P. (1987) The Narrow Moving Band, the Dutch Disease, and the Competitive Consequences of Mrs. Thatcher: Notes on Trade in the Presence of Dynamic Scale Economies, Journal of Development Economics, 27, 41–55.

LAURSEN K. (2002) Trade Specialization, Technology and Economic Growth, Routledge, London.

MARIOTTI S., MUTINELLI M. and PISCITELLO L. (2008) The Internazionalization of Production by Italian Industrial Districts' Firms: Structural and Beahvioural Determinants, Regional Studies, 42, 5, 719-735.

NARDOZZI G. (2004) Miracolo e declino. L'Italia tra concorrenza e protezione, Editori Laterza, Rome-Bari.

ONIDA F. (1999) Quali prospettive per il modello di specializzazione internazionale dell'Italia?, Economia italiana, 3, 573-629.

ONIDA F. (2004) Se il piccolo non cresce. Piccole e medie imprese in affanno, Il Mulino, Bologna.

PELLEGRINI G. (2005) “Modelli di diffusione territoriale dell'industria manifatturiera in Italia”, in SIGNORINI F. and OMICCIOLI P. (eds), Economie locali e competizione globale, Il Mulino.

RABELLOTTI R. (1997) External economies and cooperation in industrial districts: a comparison of Italy and Mexico, McMillan and St.Martin's Press, London.

RABELLOTTI R. (2004) How globalisation affects Italian industrial districts: The case of Brenta in H. SCHMITZ ed., Local Enterprises in the Global Economy: Issues of Governance and Upgrading, Cheltenham, Edward Elgar Publishers, 140-173.

RABELLOTTI R., CARABELLI A. and HIRSCH G. (20098) Italian SMEs and Industrial Districts on the move: where are they going?, forthcoming in European Planning Studies, 17, 1, 19-41.

SCHOTT P. K. (2004) Across-product versus Within-product Specialization in International Trade, Quarterly Journal of Economics, 119, 2, 647–78.

SIGNORINI L.F. (2000) Lo sviluppo locale. Un’indagine della Banca d’Italia sui distretti industriali, Donzelli, Rome.

TATTARA G., CORÒ G. and VOLPE M. (2006) Andarsene per continuare a crescere, Carocci, Rome.

VIESTI G. (1995) La geografia delle esportazioni italiane: un’analisi sui dati 1985-1991, Rivista di Politica Economica, IV, 69-97.

Table 1 - Median of RCA and Spearman's rank correlation coefficient, 1995-2005

Sub-areas	Regions	Provinces	RCA Median 05	RCA Median 95	Spearman's rank correlation coefficient
South	Abruzzo	AQ	0.054	0.043	0.74
		CH*	0.087	0.136	0.78
		PE	0.211	0.244	0.67
		TE*	0.245	0.310	0.80
	Basilicata	MT*	0.036	0.008	0.53
		PZ	0.022	0.015	0.47
	Calabria	CS	0.080	0.104	0.46
		CZ	0.066	0.099	0.46
		KR	0.000	0.115	0.42

		RC	0.026	0.019	0.52
		VV	0.000	0.000	0.26
	Campania	AV*	0.063	0.074	0.72
		BN*	0.020	0.079	0.62
		CE	0.117	0.107	0.44
		NA	0.374	0.410	0.77
		SA*	0.184	0.242	0.72
	Molise	CB	0.020	0.034	0.68
		IS	0.008	0.006	0.73
	Puglia	BA*	0.129	0.212	0.65
		BR*	0.036	0.042	0.69
		FG	0.019	0.056	0.44
		LE*	0.071	0.149	0.66
		TA	0.009	0.021	0.52
	Sardegna	CA	0.011	0.005	0.35
		NU	0.002	0.002	0.40
		OR	0.001	0.000	0.43
		SS	0.039	0.032	0.58
	Sicilia	AG	0.036	0.006	0.49
		CL	0.014	0.003	0.52
		CT	0.138	0.042	0.66
		EN	0.006	0.009	0.41
		ME*	0.067	0.016	0.63
		PA	0.060	0.090	0.59
		RG	0.018	0.029	0.65
		SR	0.003	0.000	0.69
		TP*	0.038	0.053	0.60
Centre	Lazio	FR*	0.165	0.147	0.62
		LT	0.132	0.057	0.80
		RI	0.057	0.009	0.64
		RM	0.384	0.364	0.71
		VT*	0.133	0.108	0.61
	Marche	AN*	0.179	0.213	0.82
		AP*	0.108	0.146	0.84
		MC*	0.138	0.156	0.86
		PU*	0.296	0.232	0.86
	Toscana	AR*	0.105	0.143	0.82
		FI*	0.437	0.478	0.82
		GR	0.114	0.105	0.72
		LI	0.182	0.115	0.60
		LU*	0.158	0.123	0.87
		MS	0.035	0.052	0.68
		PI*	0.096	0.127	0.82
		PO*	0.049	0.039	0.65
		PT*	0.146	0.241	0.89
		SI*	0.160	0.086	0.79
	Umbria	PG*	0.500	0.413	0.82
		TR	0.057	0.088	0.75

Table 1 – *cont.*

Sub-areas	Regions	Provinces[a]	RCA Median 05	RCA Median 95	Spearman's rank correlation coefficient
North East	Emilia Romagna	BO	0.399	0.382	0.84
		FC*	0.502	0.401	0.83
		FE*	0.159	0.092	0.77
		MO*	0.219	0.267	0.87
		PC*	0.297	0.263	0.72
		PR*	0.313	0.407	0.84
		RA*	0.188	0.288	0.81
		RE*	0.327	0.438	0.87
		RN	0.164	0.238	0.73
	Friuli Venezia Giulia	GO	0.391	0.279	0.73
		PN*	0.351	0.240	0.86

		TS	0.531	0.268	0.66
		UD*	0.313	0.263	0.79
	Trentino	BZ	0.497	0.463	0.80
		TN*	0.568	0.495	0.77
	Veneto	BL*	0.086	0.106	0.80
		PD*	0.652	0.693	0.89
		RO*	0.276	0.263	0.80
		TV*	0.537	0.520	0.90
		VE*	0.488	0.621	0.84
		VI*	0.390	0.590	0.89
		VR*	0.420	0.549	0.83
North West	Liguria	GE	0.429	0.357	0.66
		IM	0.150	0.155	0.67
		SP	0.240	0.259	0.59
		SV	0.126	0.108	0.56
	Lombardia	BG*	0.702	0.705	0.94
		BS*	0.400	0.406	0.89
		CO*	0.411	0.516	0.84
		CR*	0.586	0.530	0.72
		LC*	0.318	0.375	0.83
		LO	0.407	0.215	0.50
		MI*	0.873	0.732	0.89
		MN*	0.420	0.486	0.84
		PV*	0.233	0.273	0.88
		SO*	0.503	0.176	0.71
		VA*	0.497	0.456	0.88
	Piemonte	AL*	0.252	0.169	0.87
		AT*	0.121	0.209	0.77
		BI*	0.209	0.056	0.65
		CN*	0.518	0.493	0.87
		NO*	0.350	0.246	0.85
		TO*	0.260	0.374	0.89
		VB*	0.223	0.241	0.77
		VC*	0.207	0.259	0.79
	Valle d'Aosta	AO	0.052	0.062	0.63

*Provinces with at least one industrial district
Source: authors' elaborations on ISTAT

Table 2 - The dynamics of international specialization for Italian provinces

		β<ρ	β>ρ
0<β<1	*Significantly <0.5*	*South:* KR°, CA	-

	Not significantly different from 0.5	*Centre*: RI, LI *South:* CL°, ME*, MT*, NU, OR°, PE, PZ, SS *North West*: SV, LO	*South:* CE, CS, CZ, EN°, FG, RC, RG°, VV°
	Significantly >0.5	*Centre*: AP*, LT, MS, PG*, SI* *South:* AG°, BR*, CT, SA*, SR°, TA *North East:* BL*, FC, FE*, PC, PD*, PR, RO, VE*, VI* *North West*: AL*, AO, AT*, BG*, BS*, CR*, GE, PV*, SO*, SP, VB*	*Centre*: AN*, FI*, FR*, GR, LU, PI*, RM, TR, VT* *South:* AQ, AV*, BA*, BN*, CB*, NA, TE*, *North East:* BO*, BZ*, GO, MO*, PN*, RA*, RE*, RN, TN*, TS, UD*, VR* *North West*: BI*, CO*, IM, LC*, MI*, NO*, TO*, VA*, VC*
$\beta = 1$	*Not signignificantly different from 1*	-	*Centre*: AR*, MC*, PO*, PT*, PU* *South:* CH*, IS°, LE*, PA, TP* *North East:* TV* *North West*: CN*, MN*

* Provinces with at least one industrial district
° See footnote 12

Table 3 – Sector effects on district provinces

				District Sectors					Non District Sectors											
Area	Prov	β no sect**	B with sect**	DB20	DB40	DC	DK	DN	DB20*	DB40*	DC	DD	DE	DG	DH	DI	DJ	DK	DL	DM	DN
Centre	PU	0.993	0.983	0.424**	0.058		0.081	0.063													
North East	TV	0.958	0.896	0.346**	0.184	0.295*		-0.044													
North West	VC	0.868	0.755	0.211	0.382**																
South	BA	0.74	0.686	0.04	0.133	0.527**		0.00													
Centre	AP	0.771	0.662	0.062	0.213	0.741***								0.263*							
North East	PD	0.891	0.907	0.472***	0.022			-0.092													
North East	VI	0.886	0.817	0.383**	0.206	0.278*	0.092	0.039				0.245*					0.330***				
Centre	AN	0.912	0.908	0.098	0.013	0.291*	0.147					0.243*									
Centre	AR	0.935	0.872	0.019	0.255*			0.058			0.479**										
Centre	PO	0.927	0.406	1.063***	1.027***						0.517***										
North East	PN	0.906	0.812				0.343**	0.231*				0.428***			0.346*		0.252**				
North West	LC	0.856	0.795				0.265*											0.265*			
North West	BI	0.688	0.333	1.287***	0.956***						0.768***			0.404***	0.445*						
South	LE	0.89	0.782	0.408**	0.541***													0.362**			
North East	VR	0.855	0.795			0.036	0.055	-0.324*													
Centre	SI	0.777	0.788			-0.19		-0.283*	0.434**												
Centre	FI	0.904	0.947	-0.344*	-0.077	0.013										-0.328**					
North East	VE	0.83	0.801					-0.329**								-0.352**		-0.280*	-0.285**		
North East	TN	0.824	0.789				0.037	-0.438**				-0.394**		-0.316*			-0.307*		-0.266*	-0.474***	
North West	PV	0.889	0.89				-0.148	-0.317**		-0.313**										-0.219*	
South	TE	0.857	0.908	-0.057	-0.117			-0.311*				0.384**									
South	ME	0.491	0.506	-0.151	-0.382**											-0.382**			-0.246*		
North East	RO	0.798	0.809	0.013	0.025								0.542***				0.274*	0.293*			
North West	VB	0.726	0.67				-0.027										0.385**				
Centre	MC	0.941	0.89	0.075	0.212	0.047		0.096												-0.261**	
North East	FE	0.813	0.853				-0.008										0.322**				
North East	BL	0.79	0.794				0.037										0.234*				
North East	RA	0.826	0.781					-0.107									0.376**				
North East	RE	0.893	0.876				0.063	-0.13	0.277*	0.217*											
North West	NO	0.863	0.819				-0.179								0.514**	-0.386***					
North West	BG	0.924	0.924	0.094	-0.126		-0.074						0.194*			-0.215**					-0.184*
North West	CR	0.671	0.651				-0.055						-0.416*						-0.325*		
North West	AL	0.856	0.838				0.041	-0.003								-0.423***				-0.249*	
North West	AT	0.797	0.757				-0.207				-0.401*					-0.384**			-0.286**		
North West	CO	0.865	0.833	0.227	0.091													-0.268*		-0.263**	
North West	MN	0.897	0.885	0.302	-0.012			-0.26								-0.272*			-0.290**		
North West	VA	0.894	0.904	-0.078	-0.007						-0.325*										-0.217*
North West	CN	0.916	0.903					-0.054						-0.337**		-0.275*					
Centre	VT	0.707	0.646					-0.236	-0.580**	-0.484**	-0.450*		-0.440*	-0.545***				-0.333*	-0.384**	-0.475**	
Centre	PT	0.964	0.851	-0.106	0.019									-0.307***		-0.472***	-0.419***	-0.502***	-0.354***	-0.409***	-0.320***
North East	FC	0.822	0.806				0.097	-0.148						-0.364**							
North East	MO	0.913	0.891	0.155	0.022		0.02						-0.244*								
North East	UD	0.886	0.841				0.071			-0.304**	-0.473**										
South	AV	0.818	0.823			-0.171	-0.185		-0.661**					-0.335*		-0.334*					-0.337*
South	BN	0.792	0.678	0.035	-0.108							-0.584**	-0.450*	-0.393*				-0.458**	-0.339*	-0.622***	
South	CB	0.807	0.89	0.177	-0.022									-0.566***							
South	BR	0.767	0.742	-0.173	-0.12									-0.247*							
South	SS	0.613	0.572					-0.025										-0.363*	-0.350**		
South	TP	0.956	0.954					-0.268								-0.336**					
Centre	PG	0.837	0.835	0.187	0.202		0.023	0.026													
North East	PC	0.724	0.728				0.136														
North West	BS	0.853	0.808	-0.069	-0.011		0.097														
Centre	PI	0.833	0.844			0.049															
North West	MI	0.908	0.915					-0.099													
North West	TO	0.9	0.903				-0.083														
South	CH	0.917	0.93	0.013	0.02	-0.251															

*DB20 refers to the Textile sector and DB40 to the Clothing sector. This decomposition is obtained with the ISTAT RPI (*Raggrupamenti Principali di Industria*) classification, based on the end-use of activities (intermediate, capital and final goods).

**The number of observations for each province is 92. The first column of beta coefficients refers to regressions without sector dummies (Table A2 in the Appendix). The second column of coefficients refers to regressions with sector dummies. All coefficients are significant at 1%. The complete outputs of regressions with sector dummies are available from the authors.

Source: authors' elaborations on ISTAT

Appendix

Table A1 – Classifications - Cpateco

CPateco sectors	Groups [a]
DA - BEVERAGES AND FOOD PRODUCTS, TOBACCO	DA151, DA152, DA153, DA154, DA155, DA158, DA159, DA160 DA156, DA157
DB - TEXTILES AND TEXTILE PRODUCTS	DB174, DB175, DB177, DB181, DB182, DB183 DB171, DB172, DB176
DC - LEATHER AND LEATHER PRODUCTS	DC191, DC192, DC193
DD - WOOD AND PRODUCTS OF WOOD AND CORK (EXCEPT FURNITURE); ARTICLES OF STRAW AND PLAITING MATERIALS	DD201, DD202, DD203, DD204, DD205
DE - PULP, PAPER AND PAPER PRODUCTS; RECORDED MEDIA; PRINTING SERVICES	DE221, DE222 DE211, DE212
DG - CHEMICALS, CHEMICAL PRODUCTS AND MAN-MADE FIBRES	DG244, DG245 DG241, DG242, DG243, DG246, DG247
DH - RUBBER AND PLASTIC PRODUCTS	DH251, DH252
DI - OTHER NON METALLIC MINERAL PRODUCTS	DI261, DI262, DI263, DI264, DI265, DI266, DI267, DI268
DJ - BASIC METALS AND FABRICATED METAL PRODUCTS	DJ271, DJ272, DJ273, DJ274, DJ281, DJ282, DJ283, DJ286, DJ287
DK - MACHINERY AND EQUIPMENT N.E.C.	DK297 DK291, DK292, DK293, DK294, DK295, DK296
DL - ELECTRICAL AND OPTICAL EQUIPMENT	DL300, DL311, DL322, DL323, DL331, DL332; DL334, DL335 DL312, DL313, DL314, DL315, DL316, DL321
DM - TRANSPORT EQUIPMENT	DM354, DM355 DM341, DM342, DM343, DM351, DM352, DM353
DN - OTHER MANUFACTURED GOODS N.E.C.	DN361, DN362, DN363, DN364, DN365, DN366

[a] A detailed description of the groups is available at www.coeweb.istat.it

Table A2 – Regression output (OLS)

Sub-areas	Regions	Province	β	R-squared	ρ	t-test: β =1	t-test: β =0.5
South	**Abruzzo**	AQ	0.827***	0.58	0.76	2.34**	4.44***
		CH°	0.917***	0.77	0.88	1.59	7.95***
		PE	0.549***	0.32	0.57	5.37***	0.58
		TE°	0.857***	0.69	0.83	2.33**	5.82***
	Basilicata	**MT°**	0.534***	0.38	0.62	6.47***	0.46
		PZ	0.431***	0.39	0.62	10***	1.22
	Calabria	CS	0.534***	0.24	0.49	4.71***	0.34
		CZ	0.432***	0.16	0.40	5.50***	0.65
		KR	0.314***	0.11	0.33	7.09***	1.92*
		RC	0.683***	0.27	0.52	2.71**	1.56
		VV	0.389***	0.14	0.37	5.96***	1.08
	Campania	**AV°**	0.818***	0.54	0.73	2.28**	3.98***
		BN°	0.792***	0.46	0.68	2.31**	3.25***
		CE	0.552***	0.29	0.54	4.90***	0.56
		NA	0.789***	0.6	0.77	3.1***	4.26***
		SA°	0.711***	0.52	0.72	4.02***	2.93***
	Molise	**CB°**	0.807***	0.47	0.69	2.15**	3.42***
		IS	0.989***	0.7	0.84	0.17	7.08***
	Puglia	**BA°**	0.740***	0.54	0.73	3.63***	3.35***
		BR°	0.767***	0.65	0.81	3.96***	4.54***
		FG	0.625***	0.29	0.54	3.63***	1.20
		LE°	0.890***	0.64	0.80	1.56	5.55***
		TA	0.613***	0.49	0.70	5.92***	1.72*
	Sardegna	CA	0.335***	0.34	0.58	13.6***	3.38***
		NU	0.531***	0.32	0.57	5.71***	0.38
		OR	0.497***	0.28	0.53	5.94***	0.00
		SS°	0.613***	0.38	0.62	4.72***	1.38
	Sicilia	AG	0.637***	0.42	0.65	4.55***	1.72*
		CL	0.566***	0.43	0.66	6.35***	0.97
		CT	0.717***	0.54	0.73	4.04***	3.10***
		EN	0.641***	0.29	0.54	3.42***	1.34
		ME°	0.491***	0.39	0.62	7.86***	0.14
		PA	0.956***	0.51	0.71	0.44	4.65***
		RG	0.498***	0.2	0.45	4.81***	0.00
		SR	0.591***	0.6	0.77	7.99***	1.78*
		TP°	0.956***	0.61	0.78	0.54	5.62***
Centre	**Lazio**	**FR°**	0.678***	0.45	0.67	4.08***	2.25**
		LT	0.730***	0.62	0.79	4.49***	3.83***
		RI	0.567***	0.54	0.73	7.78***	1.2
		RM	0.713***	0.5	0.71	3.80***	2.81**
		VT°	0.707***	0.47	0.69	3.68***	2.60**
	Marche	**AN°**	0.912***	0.82	0.91	1.92*	9.05***
		AP°	0.771***	0.68	0.82	4.07***	4.83***
		MC°	0.941***	0.83	0.91	1.31	9.77***
		PU°	0.993***	0.8	0.89	0.14	9.47***
	Toscana	**AR°**	0.935***	0.74	0.86	1.10	7.42***
		FI°	0.904***	0.78	0.88	1.89*	7.94***
		GR	0.791***	0.55	0.74	2.76**	3.86***
		LI	0.502***	0.3	0.55	6.20***	0.00
		LU°	0.900***	0.77	0.88	1.92*	7.73***
		MS	0.802***	0.65	0.81	3.18***	4.86***
		PI°	0.833***	0.69	0.83	2.85***	5.68***
		PO°	0.927***	0.65	0.81	1.02	6.00***
		PT°	0.964***	0.83	0.91	0.77	10.0***
		SI°	0.777***	0.72	0.85	4.41***	5.48***
	Umbria	**PG°**	0.837***	0.71	0.84	2.86***	5.95***
		TR	0.855***	0.73	0.85	2.61**	6.39***

Table A2 – *Cont.*

Sub-areas	Regions	Province	B	R-squared	ρ	t-test: β =1	t-test: β =0.5
North East	**Emilia Romagna**	BO	0.872***	0.75	0.87	2.44**	7.10***
		FC°	0.822***	0.68	0.82	2.96***	5.35***
		FE°	0.813***	0.69	0.83	3.29***	5.49***
		MO°	0.913***	0.81	0.90	1.88*	8.93***
		PC°	0.724***	0.53	0.73	3.85***	3.13***
		PR°	0.852***	0.74	0.86	2.80**	6.67***
		RA°	0.826***	0.66	0.81	2.81**	5.27***
		RE°	0.893***	0.78	0.88	2.15**	7.94***
		RN	0.763***	0.57	0.75	3.37***	3.74***
	Friuli Venezia Giulia	GO	0.768***	0.54	0.73	3.11***	3.59***
		PN°	0.906***	0.77	0.88	1.80*	7.75***
		TS	0.742***	0.37	0.61	2.55**	2.39**
		UD°	0.886***	0.69	0.83	1.83*	6.18***
	Trentino	BZ	0.841***	0.69	0.83	2.65**	5.66***
		TN°	0.824***	0.64	0.80	2.71**	5.00***
	Veneto	**BL°**	0.790***	0.72	0.85	4.03***	5.56***
		PD°	0.891***	0.8	0.89	2.31**	8.30***
		RO°	0.798***	0.66	0.81	3.34***	4.94***
		TV°	0.958***	0.84	0.92	0.97	10.5***
		VE°	0.830***	0.69	0.83	2.90***	5.62***
		VI°	0.886***	0.81	0.90	2.51**	8.45***
		VR°	0.855***	0.69	0.83	2.41**	5.90***
North West	**Liguria**	GE	0.674***	0.48	0.69	4.44***	2.37**
		IM	0.859***	0.57	0.75	1.79*	4.56***
		SP	0.674***	0.47	0.69	4.28***	2.28**
		SV	0.554***	0.34	0.58	5.51***	0.67
	Lombardia	**BG°**	0.924***	0.88	0.94	2.15**	11.9***
		BS°	0.853***	0.81	0.90	3.38***	8.15***
		CO°	0.865***	0.73	0.85	2.40**	6.53***
		CR°	0.671***	0.47	0.69	4.38***	2.28**
		LC°	0.856***	0.73	0.85	2.62**	6.45***
		LO	0.429***	0.21	0.46	6.46***	0.80
		MI°	0.908***	0.82	0.91	2.05*	9.19***
		MN°	0.897***	0.69	0.83	1.63	6.28***
		PV°	0.889***	0.8	0.89	2.38**	8.33***
		SO°	0.769***	0.6	0.77	3.47***	4.04***
		VA°	0.894***	0.75	0.87	1.97*	7.32***
	Piemonte	**AL°**	0.856***	0.74	0.86	2.71**	6.71***
		AT°	0.797***	0.64	0.80	3.18***	4.66***
		BI°	0.688***	0.44	0.66	3.79***	2.29**
		CN°	0.916***	0.73	0.85	1.42	7.00***
		NO°	0.863***	0.67	0.82	2.11**	5.63***
		TO°	0.900***	0.77	0.88	1.94*	7.77***
		VB°	0.726***	0.58	0.76	4.17***	3.43***
		VC°	0.868***	0.65	0.81	1.98*	5.52***
	Valle d'Aosta	AO°	0.684***	0.48	0.69	4.17***	2.43**

Notes
*significant at 10%; ** significant at 5%; *** significant at 1%
° Provinces with at least one industrial district
[a] The number of observations for each province is 92 .
Source: authors' elaborations on ISTAT

Table A3 – Regression output (OLS vs Tobit)

Sub-areas	Regions	Province	Ols	Tobit (marginal effects)	Censored obervations (%)
South	**Abruzzo**	AQ	0.827***	0.763***	13
		CH°	0.917***	0.890***	4
		PE	0.549***	0.541***	3
		TE°	0.857***	0.837***	4
	Basilicata	MT°	0.534***	0.454***	24
		PZ	0.431***	0.392***	17
	Calabria	CS	0.534***	0.494***	18
		CZ	0.432***	0.410***	23
		KR	0.314***	0.297***	30
		RC	0.683***	0.577***	26
		VV	0.389***	0.279***	55
	Campania	AV°	0.818***	0.771***	11
		BN°	0.792***	0.661***	27
		CE	0.552***	0.547***	5
		NA	0.789***	0.789***	0
		SA°	0.711***	0.693***	4
	Molise	CB°	0.807***	0.698***	22
		IS	0.989***	0.748***	32
	Puglia	BA°	0.740***	0.721***	3
		BR°	0.767***	0.715***	10
		FG	0.625***	0.557***	17
		LE°	0.890***	0.858***	4
		TA	0.613***	0.585***	7
	Sardegna	CA	0.335***	0.297***	14
		NU	0.531***	0.413***	29
		OR	0.497***	0.299***	54
		SS°	0.613***	0.585***	7
	Sicilia	AG	0.637***	0.485***	40
		CL	0.566***	0.441***	33
		CT	0.717***	0.688***	8
		EN	0.641***	0.480***	47
		ME°	0.491***	0.463***	15
		PA	0.956***	0.902***	9
		RG	0.498***	0.444***	32
		SR	0.591***	0.452***	30
		TP°	0.956***	0.858***	13
Centre	**Lazio**	FR°	0.678***	0.671***	2
		LT	0.730***	0.722***	2
		RI	0.567***	0.489***	23
		RM	0.713***	0.713***	0
		VT°	0.707***	0.674***	8
	Marche	AN°	0.912***	0.905***	1
		AP°	0.771***	0.741***	7
		MC°	0.941***	0.918***	3
		PU°	0.993***	0.975***	2
	Toscana	AR°	0.935***	0.910***	3
		FI°	0.904***	0.904***	0
		GR	0.791***	0.745***	11
		LI	0.502***	0.491***	3
		LU°	0.900***	0.893***	1
		MS	0.802***	0.784***	3
		PI°	0.833***	0.821***	2
		PO°	0.927***	0.889***	5
		PT°	0.964***	0.933***	4
		SI°	0.777***	0.759***	4
	Umbria	PG°	0.837***	0.837***	0
		TR	0.855***	0.808***	8

Table A3 (*cont.*)

Sub-areas	Regions	Province	Ols	Tobit (marginal effects)	Censored obervations (%)
North East	**Emilia Romagna**	BO	0.872***	0.867***	1
		FC°	0.822***	0.818***	1
		FE°	0.813***	0.792***	4
		MO°	0.913***	0.905***	1
		PC°	0.724***	0.701***	3
		PR°	0.852***	0.847***	1
		RA°	0.826***	0.820***	1
		RE°	0.893***	0.893***	0
		RN	0.763***	0.759***	1
	Friuli Venezia Giulia	GO	0.768***	0.766***	1
		PN°	0.906***	0.900***	1
		TS	0.742***	0.751***	2
		UD°	0.886***	0.882***	1
	Trentino	BZ	0.841***	0.837***	1
		TN°	0.824***	0.817***	2
	Veneto	BL°	0.790***	0.746***	9
		PD°	0.891***	0.891***	0
		RO°	0.798***	0.781***	3
		TV°	0.958***	0.958***	0
		VE°	0.83***	0.83***	0
		VI°	0.886***	0.886***	0
		VR°	0.855***	0.855***	0
North West	**Liguria**	GE	0.674***	0.674***	0
		IM	0.859***	0.830***	7
		SP	0.674***	0.652***	7
		SV	0.554***	0.527***	11
	Lombardia	BG°	0.924***	0.924***	0
		BS°	0.853***	0.848***	1
		CO°	0.865***	0.862***	1
		CR°	0.671***	0.668***	3
		LC°	0.856***	0.845***	2
		LO	0.429***	0.431***	5
		MI°	0.908***	0.908***	0
		MN°	0.897***	0.893***	1
		PV°	0.889***	0.877***	2
		SO°	0.769***	0.74***	4
		VA°	0.894***	0.894***	0
	Piemonte	AL°	0.856***	0.846***	2
		AT°	0.797***	0.773***	5
		BI°	0.688***	0.681***	5
		CN°	0.916***	0.906***	2
		NO°	0.863***	0.86***	1
		TO°	0.900***	0.900***	0
		VB°	0.726***	0.686***	11
		VC°	0.868***	0.842***	5
	Valle d'Aosta	AO	0.684***	0.627***	13

Notes
*significant at 10%; ** significant at 5%; *** significant at 1%
° Provinces with at least one district
[b] The number of observations for each province is 92
Source: authors' elaborations on ISTAT

[1] After Germany, the United States, China, Japan, France, the Netherlands and the United Kingdom (WTO International Trade Statistics 2007 available at http://www.wto.org/).

[2] The 199 IDs identified by ISTAT in 1996 export 46% of total Italian manufacturing exports. In some sectors this share is much higher than the average: i.e. in the leather industry and agricultural machinery industry it is 85%, ceramic tiles 84%, musical instruments industry 82%, textile industry 74% (ISTAT, 2002).

[3] In 1995, the total number of Italian provinces was 103. The 7 recently created provinces are not included in this study.

[4] The choice of a particular territorial unit can influence the statistical results of the analysis. This is known as the Modifiable Areal Unit Problem (MAUP) and it has been the focus of some recent contributions (BASILE and MANTUANO, 2008; BRIANT et al., 2008). Nevertheless, in the case of Italian exports it is not possible to assess if differences in the size and the shape of the territorial units may significantly influence the empirical results because of data availability. Using various French zoning systems, BRIANT et al. (2008) conclude that both different size and shape are of secondary importance compared to specification issues.

[5] To identify IDs the unit of analysis is the local labour system (LLS), defined on the basis on information about home-to-work commuting from the Population Census. The LLS are groups of contiguous municipalities characterized by a certain level of commuting to work. IDs are identified within LLS if they satisfy specific requirements about the percentage of manufacturing employees in the LLS compared to total non-agricultural employment, specialization in one particular manufacturing industry and prevalence of firms with less than 250 employees. According to the 2001 Industrial Census, the number of districts is 156 (ISTAT, 2005). The list is available at http://dwcis.istat.it/cis/index.htm.

[6] In absolute terms, district provinces in the South are 11 compared to 12 in the Centre, 16 in the North-East and 17 in the North-West. Moreover, considering the average number of district per district province, the lowest average is in the North-West (1.71) followed by North-East (2.13), by the South (2.18) and by the Centre (2.75).

[7] The arithmetic mean in this context is a 'poor synthetic indicator' given a skewed distribution of the RCA (DE BENEDICTIS and TAMBERI, 2003).

[8] DE BENEDICTIS and TAMBERI (2003) show that the median is positively correlated with the number of sectors with an RCA above 1 and negatively correlated with the Gini concentration coefficient.

[9] This is not surprising as the share of specialised sectors is supposed to increase with the industrial development of the province, which is notably higher in the North and Centre of the country than in the South.

[10] On this point, it should be stressed that the productive system of the South of Italy is more linked to local and national market than to the external market being therefore strongly affected by the domestic as well as by the external demand conditions.

[11] This is not due to a lower number of districts in each Southern district province (see footnote 5).

[12] The marginal effects from the Tobit model are shown in Table A3 and compared with the OLS ones. The estimates are similar to the OLS ones with the exception of a few provinces with a high percentage of censored observations. Only 9 provinces out of 103 have a percentage of censored observations higher than 30%, and only in 4 of them the percentage is higher than 40%. It is worth to notice that none of these provinces are district provinces.

[13] In some of the provinces, the distribution of OLS residuals is not normal. Therefore in order to test whether the violation of the normality assumption could affect the estimates of the OLS coefficients, a median regression model has beee estimated for taking into account of possible outliers. The coefficients are similar to the OLS estimates with the exception of a few provinces. Moreover, we have estimated the OLS model using the Huber adjustment to correct for heteroschedasticity. Although the standard errors in some cases do change, the coefficients still remain very well determined (GREENE, 2003). Therefore, we believe that outliers do not seriously affect our analysis.

[14] *Specialization* in trade patterns means that a province increases its comparative advantages and simultaneously deepens its comparative disadvantages, with the effect that the structure of specialization becomes more dispersed (in terms of distance between sectors with the highest comparative advantage, and sectors with the strongest comparative disadvantage). Similarly, *despecialization* in trade patterns implies that there is a decreases in comparative advantage and a weakening of comparative disadvantages, in other words the structure of specialization in the province becomes less dispersed.

[15] This is the square root of the R-squared obtained from the regression.

[16] Using Cantwell's terminology, these provinces move towards a more 'narrow' specialization pattern.

[17] The values of β, ρ and β/ρ over the period 1995-2005 are reported in Table A-2 in the Appendix.

[18] Indeed we do not find any $\beta>1$.

[19] See footnote 2 for the ISTAT definition of industrial districts.