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Price *versus* quality competition in Italy's trade with Central and Eastern Europe over the Transition

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ABSTRACT. This paper is an investigation on the evolution of Italian trade with a group of Central and Eastern European economies (CEECs) over the period 1988-1997. CEECs show patterns of specialisation very similar to the Italian ones, based on traditional sectors, with a high intensity of labour and physical capital. Moreover, the evolution of comparative advantages suggests a tendency towards a growing specialisation of CEECs in labour intensive productions. An econometric test of the relationship between CEEC – Italy comparative advantages and industry factor intensities at 3-digit NACE level highlights a shift of CEECs comparative advantages towards labour-intensive productions over the transition. However, by considering intra-industry trade it appears that vertical product differentiation explains a relevant share of trade. Based on these results, no serious displacement effects should come to Italian exports from CEECs competition in traditional sectors, due to specialisation in different quality segments. However, important labour market effects cannot be ruled out, as suggested by an econometric test of the employment effects associated with vertical intra-industry trade of Italy with CEECs.

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Introduction

Trade liberalisation with Central and Eastern Europe (CEE) has generated two opposite effects within the EU. On the one hand, it has provided European firms with new important outlets and a growing demand for product variety and quality that transition economies are unable to satisfy. On the other hand, it has stimulated concern for the so-called sensitive sectors, such as steel, chemicals, food, textile and footwear.

Italy appears to be one of the EU countries most involved in the integration process, mainly because of its peculiar production structure and geographical proximity to Eastern Europe. Since the abolition of restraints on trade, Italy has become, after Germany, the European country representing the highest share of CEE trade. At the same time, the CEECs have shown a fast rate of import penetration on the Italian domestic market, particularly in footwear, textiles, leather and wood manufactures. The costs of integration for Italy are deepened by the still relevant bias towards the labour intensive and against the high-technology sectors in the country's specialisation.

Nonetheless, trade with eastern countries is just a further challenge to the Italian labour intensive specialisation. Since the 1980s, an increasing competition has come from developing countries, which has forced to restructure massively the traditional sectors. Quality upgrading and concentration on upper market segments was a necessary condition to avoid the risk of losing existing comparative advantages and past specialisation. There seems to be evidence that such a strategy is also being pursued in trade with the CEECs. Our analysis shows that Italy is realising growing export surpluses also in the more sensitive sectors such as clothing, textiles, footwear, and wood products, through relevant shares of outward processing trade and of vertical intra-industry trade.

Except for few cases (Graziani, 1994b; 1998), which have focused on the early 1990s or on specific sectors, the Italy-CEE pattern of trade represents

still an under-researched area. The fact is that the literature has focused on the more general integration process of CEE with the EU as a whole (see, for instance, Hamilton and Winters, 1992; Rollo and Smith, 1993; Drabek and Smith, 1995; Landesmann and Burgstaller, 1997; Aturupane, Djankov and Hoekman, 1997; 1999), although some important examples of analysis of bilateral trade are also available for the early stages of transition (see, for instance, for Austria, Aiginger *et al.*, 1994; for France, Greece and Spain, see Faini and Portes, 1995; for other EU countries, European Economy, 1994). This paper aims to fill the gap now outlined in the literature, by means of an investigation on the main features of the integration process of Italy *vis-à-vis* CEE all over the years from 1988 to 1997.

We will consider trade relations between Italy and a group of CEECs, including Bulgaria, Romania, Poland, Albania, Hungary, Czechoslovakia / Czech Republic, Slovak Republic, Yugoslavia / Slovenia. The outline of the paper is as follows. In section one, inter-industry trends in Italian exports and imports with the CEECs are examined by means of indices of comparative advantages and of relative export specialisation on the EU market. This analysis is mainly aimed to check whether substantial changes in the product structure of trade have taken place and what sectors and productive factors might be most involved by the Eastern competition. Econometric analysis follows, which is aimed at measuring the extent to which the pre- and post-transition trade structures can be explained by factor endowment differentials (section 2). In section 3, the focus is on the role of product differentiation and quality upgrading in the changing commodity composition. This is done through an assessment of the weight of high and low quality intra-industry trade (IIT) measured by the Grubel-Lloyd index. Section 4 develops the analysis of IIT at a sectoral level. Section 5 gives some hints on the likely impact of different sources of trade with the CEECs on different categories of workers. Some concluding remarks follow.

1 – Structural changes in comparative advantages of Italy vis-à- vis the CEECs.

1.1 – A general picture of Italy-CEE trade

During transition, Italy has strengthened its 1989 position of second most important European trade partner for Eastern Europe after Germany, as an outlet and as a supplier. Table A.1 in Appendix B shows that with the exception of exports in 1993, shares of Italian exports and imports with the CEECs are much higher than France' and the UK's ones. Main trade flows in percentage terms are with Albania and Romania. The position of Italy with each Eastern country remains substantially stable over the decade, although the export shares underwent slight reductions from 1989 to 1993 and recovered thereafter. In 1997, Italy appeared to be responsible for between 6 (Slovenia) and 62 (Albania) per cent circa of the total EU imports and for between 18 (Bulgaria) and 35 (Albania) per cent circa of total EU exports.

Trade between Italy and CEE has dramatically increased over the last decade. Between 1988 and 1997 Italy's total trade with our group of eight CEECs[1] climbed from 2.6 to 9.5 per cent of extra-EU trade and from 1.1 to 4.4 of world trade. Chart 1 shows that the J-curve of transition – a dramatic slow down followed by a similarly dramatic recovery – translated also to trade with Italy, as both imports and exports declined in the early 1990s and

[1] The group includes Hungary, Poland, the Czechoslovakia / Czech Republic, the Slovak Republic, Albania, Bulgaria, Romania, Yugoslavia / Slovenia.

grew thereafter. However, Italian exports went up faster than imports on average. For the CEECs, the increasing trade imbalances mirror the difficulty of internal supply to fulfil a demand that expanded rapidly and steadily after the transition shock of the early 1990s. Similar to other EU and non-EU countries, Italian producers have been catching the opportunities offered by Eastern Europe's expanding demand.

Such turmoil is likely to have hit all the sectors and to have substantially changed the composition of trade. We can take a first look at the statistics on exports and imports by sector to see which one accounts for a larger share of Italy-CEE trade and which one was most affected by the transitional shock. Chart 2 reports levels of exports and imports by sector of activity, defined according to the NACE-CLIO R.25 classification. Italian exports appear to concentrate on two productions: Machinery (7) and Textile, Clothing, Leather and Footwear (12). In three other sectors, such as Metal products (6), Electrical Goods (9) and Transport Equipment (10), exports also stand out. All these sectors show a relevant increase from 1989 to 1997, with the exception of Metal Products (6) in 1992. Hence, similar to that towards other countries (De Nardis and Paternò, 1997), the pattern of Italian exports to CEE is based on traditional sectors and the capital goods used in their production. At the same time, Italian trade patterns relevantly differ from those of other EU countries, which tend to export less traditional goods.

While Italian exports generally grow in almost every sector, imports show dramatic shifts. These are positive in the case of Textiles (12) and Transport Equipment (10), that, not surprisingly, Neven (1995) classifies as sectors with a high content of labour and physical capital (see Tab. A.11). The changes are negative in the case of Agriculture (1) and Food (11), Metal (6) and Chemical and Pharmaceutical Products (5). These sectors happen to be the most affected by the "asymmetric" trade regime introduced by the Europe Association Agreements between EU and CEE, implemented

in the first half of the 1990s. The EAs determined a gradual relaxation of tariff and non-tariff barriers for all the CEE-EU interchange, but not for that in agricultural goods. Moreover, trade barriers would have been floored at a slower pace in the case of the "sensitive" sectors, such as Iron and Steel, Chemicals, Textiles and Clothing, Leather, Footwear, Furniture, Glass and Vehicles (Faini and Portes, 1995). As a matter of fact, the EAs introduced asymmetries in trade liberalisation in as much as they imposed a slower pace of trade opening in the very sectors where CEECs had comparative advantages.

The massive reduction in Italy imports of Energy (2) depends entirely on policy factors, and in particular on the collapse of the CMEA agreement. In fact, as noted by Dobrinski (1995), CEECs used to export relevant amounts of transformed energy, not because they had any comparative advantage in its production, but simply because they could obtain it free from the former Soviet Union. The author correctly predicted that maintaining the performance of this sector in the post-transition era was not viable.

At this stage of the analysis, two important findings are worth being reported. Firstly, all over the transition, Italy maintains positive trade balances, thanks to the expansion of exports in almost all the sectors and to the reduction of imports of raw materials, agricultural and metal products. The performance of Italy's productions benefited of the Eas, which played a role in preventing CEE firms from fully exploiting their specialisation in the "sensitive" sectors and in triggering Italian productions, among others. Secondly, in the pre-transition era, CEECs were oriented towards raw material productions and industries based on an intensive use of physical capital and labour. In the post-transition era, raw material productions tend to reduce their importance mainly in favour of labour intensive productions.

Furthermore, the evidence presented so far is already suggestive of an important peculiarity of Italy and CEE specialisation in the pre- and in the post-transition eras. In spite of the existence of relevant factor endowment

differentials, the trade partners considered exhibit a noticeable similarity of trade patterns, at least at this very high level of aggregation. In particular, they tend to exchange with each other goods whose production is based on an intense use of labour. As a consequence, we would expect that one-way trade represent low shares of total trade and that the determinants of trade be the factors traditionally associated with trade in similar goods, i.e. product specific and firm specific, such as variety, product differentiation and scale economies, more than factor endowments. However, this would be rather surprising, considering that the countries involved have different factor endowments and levels of technology. How to explain such a peculiarity? The answer to this question has to be found in the fact that the Italian pattern of specialisation is rather anomalous, especially when contrasted with that typical of other advanced countries. Enlightening this anomaly is difficult when the analysis is conducted at a sector level though. When the analysis is led at a product level, then quality product differentiation appears to be an important part of the explanation. This issue will be dealt with in the following sections.

1.2 – The patterns of revealed comparative advantages

It has now been noted that the trade pattern of Italy *vis-à-vis* CEE is characterised by similar specialisation patterns. Nonetheless, considering the import and export levels does not tell us in which sector the comparative advantages of each country lie. In order to quantify the degree of specialisation of Italy and CEE in different sectors, we compute a Revealed Comparative Advantages (RCA_j) index, using the following formula, provided in Neven (1995):

$$RCA_j = \frac{\frac{X_j}{X} - \frac{M_j}{M}}{\frac{X_j}{X} + \frac{M_j}{M}} \qquad [1]$$

where RCA_j measures the revealed comparative advantages of a given country in industry *j*, adjusted for trade imbalances. X_j and M_j represent the country's (Italy) unadjusted exports to and imports from a given country or group of countries (CEECs) in the relevant industry. X and M are the total Italian exports and imports to the CEECs. The index ranges between –1, when the country under consideration does not export any good in the sector *j*, and +1, when it does not import any good in the sector *j*. A positive (negative) value indicates the presence of a comparative advantage (disadvantage) of Italy *versus* CEE. The index equals zero, when the country's export and import shares are exactly the same[2].

RCA values in Italy-CEE trade calculated for all the Nace-Clio R.25 sectors over the period 1988–'97 confirm some findings of the previous analysis and let us introduce new issues. Chart 3 shows that the highest values of the index concentrate in Agricultural and industrial machinery (7), Office and data processing machines (8), Electrical goods (9) and Rubber and plastic products (15). This suggests that, despite the fact that Italy tends to export high levels of traditional goods to CEE, it has comparative advantages in goods embodying high levels of technology.

Nonetheless, it is also worth observing that in the most skill intensive sectors (7-9) Italy has suffered reduced RCAs over the years. Perhaps, this

[2] Notice that [1] differs from the usual Balassa' (1965) index of RCA, as ours considers not only exports, but also imports, in order to control for trade balances. Moreover, the Balassa' index weights the export share of country A to country B in sector *j* by the share of imports by B from any other country. In other words, it measures the relevance of a country's export to another country relative to the imports of the latter from any other country. As a consequence, our index measures the excess shares of import over export or *vice versa*, whereas the Balassa' index provides a measure of specialisation in export by a given country.

could be a signal of the presence of a large endowment of highly skilled labour in Eastern economies and of an increasing ability to exploit it. In fact, in the early stages of transition, some studies suggested that CEECs had a large endowment of skilled labour and hence could be relatively efficient in the production of advanced goods where skilled labour is used intensely (see for instance Hamilton and Winters, 1992).

However, so far, the CEECs have shown weak comparative advantages in sophisticated high-tech manufactures and the upgrading of their export structure seems to be rather slow both towards the EU and Italy. As a number of more recent studies have pointed out (Landesmann, 1994; Rosati, 1994; Kaminski *et al.*, 1996), over the transition, there seems to have been a shift towards products which use unskilled labour intensively. Chart 3 confirms that the CEECs have quite steady comparative advantages in Agricultural goods (1), in Metal Products (6), in Wood (13), in Paper (14) and in Other manufactured products (16). This is more in line with what we had observed commenting the sectoral distribution of import and export levels. In fact, the aforementioned sectors are based on an intense use either of raw materials or of labour.

The tendency of CEECs to specialise in labour intensive productions is mirrored in the dramatic shift observed in the RCA value relative to Textiles (12), which turns from positive to negative in the last two years considered. This is a fact that worries policy makers and industrial organisations. In fact, it could be that, in a longer period, Italian producers might be more affected by the impact of trade expansion with the CEECs in these sectors. However, it should be considered that the Italian performance in Textiles is a phenomenon in which the practice of outward processing trade (OPT) has played a crucial role. Italian producers export fabrics to the CEECs and then import the finished clothing products under a special tariff regime. Imports of sensitive products are otherwise subject to special measures of protectionism (anti-dumping and safeguard clauses) within the EAs. Thus,

OPT gives rise to strategic imports as they are related to relocation abroad of labour intensive stages of the production process (Graziani, 1994b).

Finally, as already noted in the previous section, the case of Energy (2) is an exception.

Overall, this is evidence of two basic facts. First, CEECs appear specialised in physical capital and energy-intensive productions. This traditional specialisation pattern has not been reversed yet. Nonetheless, over the decade, CEE has acquired an increasing advantage in labour intensive productions. As a result, Italy tends to lose ground in labour intensive productions, such as Textiles, leather and footwear, but shows comparative advantages in human capital intensive goods, such as Machinery, Office and data processing and Electrical engineering, which did not appear in the analysis of the previous section.

From the visual inspection of Chart 3, we have an impression of certain stability in patterns of RCA, but we noted the existence of dramatic shifts in some sectors, such as Energy and Textiles. Overall, at this very aggregate level, continuity in comparative advantages seems to prevail over drastic changes. We want now to carry on a formal test of stability in sectoral trade patterns. To such an end, the correlation between the RCAs indices relative to three trade partners (CEECs, Italy and EU) and to three different periods (1988-'92, 1992-'95, 1988-'95) has been studied. The results relative to the sectors of the NACE-CLIO R.25 classification are presented in Table 1. The correlation coefficients in rows one and four reveal that the structure of Italy-CEE and EU-CEE trade has not undergone significant changes, as the values are in both cases higher than 0.65 over the entire period and only slightly lower than the value which Italy-EU trade exhibits (row five).

Tab. 1 - Correlation coefficients between RCA indices relative to different years and countries (1988, 1992, 1995)

Countries RCA[1]	1988	1992	1995	'88-'92	'92-'95	'88-'95
Italy-CEE[2]				.85	.75	.84

Italy-CEE[3]				.67	.70	.57
Italy-CEE[4]				.58	.60	.46
EU-CEE[2]				.68	.76	.83
Italy-EU[2]				.99	.92	.89
Italy-EU / CEE-EU[5]	.15	.19	-.03			
Italy-EU / CEE-EU[6]	.46	.54	.51			
Italy-CEE / EU-CEE[2]	.79	.48	.42			

Notes: [1] The usual Pearson's correlation coefficient, i.e. $\rho = COV(X,Y)/\sigma_X \sigma_Y$, is used.

[2] Computed using NACE R.25 classification.
[3] Computed at a 3-digit NACE classification (124 industries).
[4] Computed at an 8-digit CN classification (11.080 products).
[5] It includes sectors 1, 2 and 3 of the NACE R.25 classification (see the note to Table 2 in the Appendix for the definitions).
[6] It excludes sectors 1, 2 and 3 of the NACE R.25 classification.
Source: own calculation on COMEXT database.

The NACE-CLIO R.25 classification is very aggregate and does not take into account a possible composition effect, which might be hidden within industries. In other words, there might have been significant changes in the relative importance of individual items that only a calculation of RCAs at a more disaggregated level might detect. To test this hypothesis, correlation coefficients have also been calculated using RCA indices at the 3-digit Nace and 8-digit CN classifications. The results, provided in the rows two and three of Table 2, are again significant at the one per cent level. Yet, the coefficients show a level of correlation quite high, considering the large number of products included. This result suggests that also in the case of Italy-CEE trade the magnitude of changes in the export structure of the CEECs has been relatively small, in spite of the drastic shift in the direction of their trade. Smith and Drabek (1995), Halpern (1995), Landesmann (1995) Hoekman and Djankov (1997) Brenton and Gros (1997) formulate this hypothesis in studies relative to different countries and periods.

1.3 – The Italy-CEE competition on EU markets

Besides the impact of CEE trade on domestic markets, Italian productions are also facing a potential displacement effect on the EU

market. The condition for this to be true is that Italy' and CEE productions have a similar pattern of exports on EU markets. In fact, in this case, the substitution of Italian with CEE goods is more likely.

To test this hypothesis correlation coefficients have been computed between Italy-EU and CEE-EU RCAs for 1988, 1992 and 1995, respectively. The results are shown in the last three rows of Table 1. Row 6 reveals very low coefficients, which become negative in 1995. This would suggest rejecting the hypothesis of similarity of Italy and CEE RCAs on EU markets. Interestingly, however, correlations are very sensitive to the inclusion of sectors 1, 2 and 3 in the comparison. This is due to the traditional scarcity of raw materials in Italy and their relative abundance in CEE. A significant and increasing correlation exists (higher than 0.5) between RCAs of Italy and CEECs' toward EU if sectors 1 through 3 are left out.

A further way to check for the potential displacement of Italian by CEE products on EU markets is carried out calculating a Specialisation Index (SI) of Italian and CEECs exports to the EU-11 (EU-12 minus Italy). SI measures the degree of similarity in trade. The index, whose formula is provided in the note to Chart 4, equals one (zero) in case of perfect (no) identity of specialisation between Italy and CEE. When the value of the index is higher (lower) than one, Italy is more (less) specialised than CEE in the production of the good to which the index refers.

Chart 4 shows that for a large number of sectors there seems to be no evidence that Italian exports are facing competitive displacement in the EU market because of increased competitiveness from the CEECs. In fact, SI is consistently higher than 1 in the case of the sectors 5 (Chemical), 7 (Agriculture and industrial machinery), 8 (Office and data processing), 10 (Transport equipment) and 15 (Rubber and plastic). Notice that these are the same sectors for which we have found that Italy has positive revealed comparative advantages (Chart 3), but not high export shares (Chart 2). This

simply confirms that CEE productions are not a menace to the Italian ones in these sectors, at least in the short run.

However, this is not the case for the so-called sensitive products. The index takes values not significantly different from one in the case of Agriculture (1), Metal products (6), Food (11), Textile (12), Paper (14) and Other manufactures (16). Moreover, a tendency of the SI to converge on 1 is observed in three other sectors (7, 8 and 10) over the period. Thus, the hypothesis that trade expansion might represent a threat for Italian exports to EU in a significant number of productions cannot be ruled out. Increasing similarity in patterns of specialisation seems to have emerged from the shift of the CEECs towards different factor endowments. Graziani (1994b, p. 458) conducted a similar analysis at a more disaggregated level of production over the period 1985-'92. He found that already in the early stages of transition the "sensitive" sectors were those most threatened by CEE productions.

The increasing similarity in patterns of specialisation of CEE *vis-à-vis* Italy is expected to lead to enhanced competition as far as inter-sectoral trade is concerned, but it might also be a driving factor of increasing intra-industry trade (IIT). The adjustment effects of IIT are not as simple to predict as those typical of inter-industry trade. The relevance and the nature of Italy-CEE intra-industry trade will be analysed in section three. In what follows, an attempt will be done to test econometrically whether similar patterns of specialisation are associated with similar or different factor endowment in the countries considered.

2 – The factor content of Italy's trade with CEE

The previous analysis of revealed comparative advantages suggests that, despite the similarities in specialisation patterns, an Heckscher-Ohlin-

Samuelson (H-O-S) model could be a relevant source of explanation of the developing patterns of Italy's trade with CEE, as far as inter-industry trade is concerned. Notwithstanding the limitations of this theory of trade, which will be further discussed later on in this section, we expect the H-O-S model to be the most appropriate tool of analysis in the context of partners so different for level of development and factor endowment. If this is true, we should find that the goods exchanged embody different factor intensities, as a result of a different factor endowment between Italy and Eastern European economies. To test this hypothesis, we estimate OLS cross-sector equations relative to the 3-digit NACE manufacturing industries using as dependent variable the index of revealed comparative advantages of Italy's trade towards the CEE introduced in the previous section and as regressors factor intensity measures. This methodology has been already applied to Austria (Aiginger *et al.*, 1994) and the EU (Landesmann, 1995; and Dobrinsky, 1995) trade with various transition countries, although only for the period from 1988 to 1992.

Before presenting the results, it should be considered that in the literature it is claimed that the relative factor abundance of formerly planned economies switched radically through the transition from physical capital to labour. As far as the pre-transition period is considered, according to official statistics, the portion of investment devoted to the heavy industry was higher than in most advanced economies, suggesting the existence of a relative abundance of physical capital. Moreover, official statistical figures often highlighted the chronic lack of labour, which used to lead to virtually no unemployment. These data should be considered with caution, though. As noted by Aiginger *et al.* (1994), assessing the capital labour ratio in CEE countries and comparing it to Western standards is not an easy task. In fact, there are wide discrepancies in the figures available according to whether the statistical sources deployed are from OECD, ECE, UNCTAD or national. Generally, official statistics on investment as well as on GNP

proved to be very unreliable. However, it is hardly disputable that investment was one of the political priorities. Moreover, heavy industries and intermediate productions were favoured at the expense of light industries and the production of consumer goods in general. As a consequence, capital was available at a low cost. Conversely, when the post-transition period is considered, the data and the anecdotal evidence point to the emergence of a very abundant supply of cheap labour and to an increasing shortness of capital (see, for instance, Graziani, 1994a; Halpern, 1995; Faini and Portes, 1995).

Special attention has been devoted in the literature to human capital endowment, as this could represent an important factor of catching up. CEPR (1990) and Hamilton and Winters (1992) noted that the labour force in CEE appears to be well educated and rather skilled compared to the standards typical of the majority of the less developed countries. Nonetheless, the role of the high human capital endowment in Eastern countries has been questioned on two grounds. Firstly, the reliability of information on human capital is not always accepted. Evidence based on different data sources and on different measurement units are not always consistent with each other, suggesting that the figures could be inflated (see, for instance, Graziani, 1994a). More importantly, serious problems could exist in exploiting the available stock of human capital and adapting it to the new techniques, organisation and incentives of the capitalist economy.

This is also the conclusion of a study of the determinants of quality in trade by Ferragina and Smith (1999). They find that a measure of schooling gives the wrong sign when the Eastern European countries are included in cross-country regressions of income and educational data against price / quality gaps, suggesting that educational statistics for these countries overstate the economic value of the education provided.

The information available on factor endowment in CEE suggests that in the past eastern countries enjoyed an export surplus in capital intensive

industries of national importance. This specialisation would have partly changed after transition in favour of labour intensive sectors. Of course, we do not expect that the shift in trade be radical due to the large stock of capital accumulated in these economies in the past and to the recent injection of foreign capital. The comparison between the results relative to the late 1980s and the mid-1990s is expected to provide a tentative answer to the question whether a structural change has happened over the 1990s in comparative advantages of transition economies, reflecting a change in factor endowments.

The analysis of the results of the estimates should consider that some assumptions of the H-O-S model are not very realistic, especially in the case of trade involving transition economies. Particularly restrictive is the assumption of identical technology across countries as the production functions between the CEECs and Western economies are substantially different. Also the hypothesis of perfect competition plus constant return to scale is in contrast with the strong degree of monopoly which characterises the post-communist productive systems. Yet, special caveats apply to a situation of strong disequilibrium, growing trade imbalances and structural changes, as that experienced in Eastern Europe. Furthermore, East-West trade is far from being free. On the one hand, tariff and non-tariff barriers, such as the exclusion of agricultural goods from the European Association Agreements, safeguards and anti-dumping measures and so on, could pose important impediments to the process of adjustment of prices to their equilibrium level in the market. On the other hand, the rigidities typical of the Italian labour market could reduce the ability of the RCA index to mirror the relative abundance of labour. As shown below, all these factors could affect the performance of the model, reducing its overall significance level.

In table 2, a set of estimates is presented relative to Italy's trade with a group of 8 CEECs. The set includes OLS equations that regress indices of

factor intensities in industrial productions[3] on revealed comparative advantages[4]. The first four equations use as dependent variable the *level* of the RCA index of Italy's trade with CEE relative to the years 1988, 1992, 1995 and 1997, to study the evolution of the link between comparative advantages and factor intensities. Three equations using as dependent variable the *change* in the RCA index over the three sub-periods, 1988-'92, 1992-'95, 1995-'97 are also included. This type of estimate is aimed to test the hypothesis that *structural changes* in trade can be explained by factor endowment determinants. The explanatory variables are the same in all the estimates and are defined in the note to the table. They are measures of relative factor intensities of Italian manufacturing industries at the 3-digit level from INDE (Eurostat industrial dataset) relative to 1991, except the expenditure in research and development which is from ANBERD (OECD). Specifically, the variables deployed are proxies for capital, labour, R&D and skill intensities. Note that considering only the manufacturing industries represents an important difference with respect to the analysis of the previous section. The estimates provide a test for two hypotheses: first, that factor endowments matter and, second, that a structural change in trade flows has taken place in line with the H-O-S model.

The first estimate uses data relative to 1988, when the COMECON was still operating and trade and production still obeyed to the planning directives. The second equation refers to 1992, a year in which the transition shock reached its peak. Recall that in 1991 the COMECON system of trade collapsed, producing massive sectoral shifts in trade from East to West. According to Drabek and Smith (1995), already in 1992 the countries belonging to the Visegrad group had almost completely re-oriented their exchange to the EU and other Western economies. The last two equations

[3] Notice that the factor intensity in the industries is only a proxy of the relative country's factor endowment.

[4] These are calculated using Eurostat-COMEXT data

are estimated for 1995 and 1997. By then, a relative stabilisation is supposed to have been reached in most countries; in fact many observers argue that the transition process was already completed in the countries belonging to the Visegrad group. All this considered, we do not expect the regressions relative to 1988 to have a relevant explanatory power as the strategies of planning were not necessarily in line with factor endowment considerations and trade was far from free. The explanatory power of the model should increase in the following years, although the relevant structural change in trade patterns and the pressure of the adjustment process might have been an obstacle to the full development of long term comparative advantages.

Overall, the explanatory power of the equation relative to 1988 is slightly lower (adjusted R^2 equal to 0.15) than that relative to 1992 (0.32) and to 1995 (0.22). The values for 1988, 1992 and 1995 are quite satisfactory for a cross-section estimate relative to 100 different sectors and including 9 countries. In fact, notwithstanding the presence of rigidities and policy factors, sector and country specific factors could also be at work and explain why the figures are not higher than that[5]. In 1992, all the variables appear significant and have the expected signs. In 1995, only the skill intensity variable is not significant. These results may be evidence that factor endowment can explain an important part of the Italy-CEE trade pattern. The differences between the estimates relative to the beginning and the end of the period are not so relevant to suggest that structural change has taken place in factor endowment.

Table 2 - Determinants of Italian trade with CEECs (Revealed comparative advantages regressed on factor intensity data, 3-digit Nace industries, 100 observations; 1988-'97)

CEECs	R^2 adj.	C	CI[2]	LI[3]	R&D[4]	SI[5]	D-W	F-stat.

[5] In his estimates of the determinants of RCAs relative to the trade of Austria with different CEECs in terms factor intensities, Aiginger *et al.* (1994) finds values of the (non-adjusted) R^2 between 0.11 and 0.24.

RCA88[1]	.15	.52***	-.18***	-.01	.00	.17*	1.70	5.47
		(3.15)	(-4.36)	(-.63)	(.16)	(1.75)		
RCA92	.32	.92***	-.22***	-.06***	.01***	.14**	1.53	12.53
		(7.27)	(-6.69)	(-4.69)	(5.70)	(2.00)		
RCA95	.22	.96***	-.19***	-.04***	.00***	.08	1.41	7.95
		(6.24)	(-4.41)	(-2.74)	(4.13)	(1.45)		
RCA97	.05	.44***	-.15***	-.00	.00**	.02	1.54	2.17
		(2.02)	(-.3.35)	(-.24)	(1.91)	(.15)		
RCA92-RCA88	.19	.40***	- 3.97***	-.06***	.00***	-.03	1.81	6.77
		(3.43)	(-1.19)	(-3.92)	(3.19)	(-.53)		
RCA95-RCA92	.02	.04	3.48	.02	-.00	-.06	1.78	1.40
		(.32)	(1.45)	(1.15)	(-1.60)	(-1.43)		
RCA97-RCA95	.04	-.51**	2.71	.04*	-.00	-.05	1.90	1.05
		(-2.36)	(.50)	(1.73)	(-.28)	(-.40)		

[1] RCA = Revealed comparative advantages
[2] CI= capital intensity: investment as percentage of the number of employees (Eurostat INDE dataset, 1991).
[3] LI = labour intensity: number of employees per production value (INDE dataset, 1991, 3-digit).
[4] R&D = R&D intensity: R&D expenditure on number of products in each industry (OECD ANBERD dataset, available only for higher level of aggregation and repeated for subsectors). Other proxy also tried: R&D per turnover, R&D on number of firms, R&D expenditure in million dollars, R&D expenditure on sales.
[5] SI = skilled labour intensity: non manual/manual labour ratio (INDE dataset, 1991).
[6] D-W stands for the Durbin-Watson statistic.
[7] The values in parentheses below the coefficients are t-ratios. The asterisks *, **, *** are indicating a significance level equal to 10% (t>1.65), 5% (t>1.97), 1% (t>2.34), respectively.

The goodness of fit of the equation relative to 1997 is unsatisfactory and puzzling. More generally, there seems to be a reduction in the adjusted R^2 from 1992 to 1997 and hence in the ability of the model to explain RCA levels in terms of factor intensities. This points to the presence of different factors, in shaping trade patterns in the most recent years. Variables from the *new trade theories*, such as product differentiation and quality, concentration of industries, economies of scale, volumes of demand, should be introduced in the analysis[6].

All over the period, the capital-intensity variable has a negative and highly significant coefficient. Also the absolute value is very similar in all the estimates. This result seems to lean towards the hypothesis that in the pre- *and* in the post-transition era Italy has had comparative disadvantages in sectors that make an intense use of physical capital. We would have expected that the current capital scarcity in the CEECs be reflected in

[6] Another possibility is that the relative factor intensity of the Italian industries has changed after 1991. Testing of this hypothesis is left to future research.

positive RCA for Italy in such sectors over the most recent years. Conversely, CEECs seem to keep the past advantages in heavy industries, maybe because the production capacities are very large from previous investment and depreciation has been mitigated by western investment.

The coefficient for labour intensity is also constant and always negative for all the years considered, suggesting that the CEECs are specialised now in labour intensive exports. It is highly significant in 1992 and 1995, but not significant in 1988 and in 1997. Despite the differences in the significance level over the years, similar to the physical capital, the absolute value is constant. The skill endowment variable is always positive, but is significant only in 1988 and in 1992. The result suggests the existence of a weak specialisation of Italy in skill-intensive goods, which tends to reduce over the years. This is the only variable for which the absolute value of the coefficient remarkably changes from the beginning to the end of the period. The result might suggest that the stock of human capital in CEECs has started to be used recently, perhaps thanks to capital inflows from the West. Finally, Italy appears to have strengthened her specialisation in technology intensive productions. In fact, the R&D variable becomes significant in 1992 and remains so thereafter, although always with very low coefficients.

The analysis of the coefficients of the static equations confirms the fact that consumer goods were highly discriminated under the socialist regime. In other words, trade with Italy could mirror the bias in the socialist allocation system towards capital intensive industries. In the meantime, CEECs seem to have inherited from the pre-transition period advantages in labour intensive productions. Italy preserves her advantage in industries with a higher technological content. In all these cases, no coefficient shift can be detected from the pre- to the post-transition period, suggesting that if a tendency is present it is towards sectors with a high intensity of capital *and* labour. The exception is the variable for skill intensity, which seems to decline relevantly, suggesting that either Italy is losing or CEECs are

gaining ground. These conclusions are similar to those of Aiginger *et al.* (1994) relative to CEE trade with Austria and those of Landesmann (1995) and Dobrinski (1995) relative to CEE trade with the EU.

The results of the second specification, using as dependent variable the *changes* in RCA between sub-periods regressed on the indicators of factor intensity, seem to confirm the previous conclusions. Only the first equation, relative to the period 1988-92, has some explanatory power, with an adjusted R^2 of almost 0.20. In particular, it seems that Italy has lost ground in labour *and* in physical capital intensive industries. This somehow confirms the priors about the high capital endowment and the rich supply of labour in CEE. The low level of significance of the dynamic estimates relative to the following period suggests that the factor intensity variables are unable to explain the eventual changes happened in RCAs. Overall, the analysis gives support to the initial hypothesis of an increasing concentration of CEECs' exports on physical capital *and* labour intensive goods. It is interesting to notice that this result is similar to that obtained by Dobrinski (1995) with different analytical tools, but partly different from that of Landesmann (1995) and Aiginger *et al.* (1994). These last notice a *worsening* in capital intensive industries of the CEE comparative advantages, besides the *improvement* in labour intensive productions. The difference could be explained considering the particular pattern of Italian specialisation in labour intensive industries, compared to that of Austria and the EU.

In unreported estimates the same equation of table 2 is estimated for Hungary, Poland, Yugoslavia and Bulgaria. These regressions have a much lower explanatory power than the previous ones. If something can be said, it is that the coefficients do not provide any evidence of changes in trade specialisation. There is a generally highly significant positive coefficient for the variable R&D, which confirms that the specialisation of Italy in high-technology sectors, already present in 1988, has been maintained with

respect to all the countries considered. Generally, there is a negative sign for the capital intensity variable and the coefficient appears significant for Bulgaria in 1988, Yugoslavia / Slovenia in 1992 and 1995, Hungary in 1992 and 1997. This suggests that this group of countries has still a quite relevant comparative advantage in capital intensive productions. The labor-intensive variable is often non-significant and the coefficient sign appears positive for Bulgaria and Hungary and negative for trade with Poland and Yugoslavia.

3 – Determinants of intra-industry trade

In section one, it has been noted that Italy and CEECs show a very similar pattern of specialisation when the analysis refers to broad sectors of activity (NACE-CLIO R.25). Section two has shown that albeit similar the patterns of specialisation of Italy and CEE are associated with different factor endowments. The differences in factor endowment appear significant when the analysis is disaggregated at a 3-digit level. This suggests that intra-industry trade (IIT) might be a relevant part of the increasing degree of economic integration of CEE with the EU.

The adjustment effects of IIT are not as universally known as those of inter-industry trade and it is perhaps worth recalling that two different views contend the theoretical ground. According to the traditional models of IIT (Krugman, 1979; Helpman, 1981; Helpman and Krugman, 1985), this kind of competition typically arises between advanced countries with similar specialisation and factor intensities and leads to reciprocal rationalisation of the productions, scale economies, more variety and lower costs. Intra-industry trade (IIT) is generally associated with growing levels of diversification of production and with the expansion of quality and design[7].

[7] The level of IIT has also been defined as a measure of revealed product differentiation.

According to Dosi, Pavitt and Soete (1990), high shares of IIT are associated also with a faster innovation process and diffusion of technology.

In order to provide a satisfactory assessment of the level of IIT in Italy-CEE trade, the Grubel-Lloyd index is computed using data with a different degree of aggregation. It is well known that the share of two-way trade is higher the higher is the level of aggregation of data. In fact, high shares of IIT at a 3-digit level compared to those at a 8-digit level could be not only a statistical artefact, but could also reflect very peculiar forms of IIT, such as OPT.

However, the inspection of the *levels* of IIT alone whatever the degree of aggregation adopted does not help us explaining the impact of the trade opening of Eastern Europe on Italian productions, i.e. on factor prices and sectoral reallocation. It does not provide a satisfactory understanding of the level of economic convergence between trade partners either. To such an end, it is important to analyse the *changes* in IIT levels. This will be also done using the index of marginal IIT.

According to another strand of literature (Falvey, 1981; Falvey and Kierzkowski, 1987), IIT may be the result of a quality competition and is not necessarily associated with identical endowments and technologies, although it mainly develops if the partners have both reached a certain level of development. In this case, two-way trade regards goods belonging to the same industry, but attached with them is a very different level of quality. In what follows, measures of the degree of quality diversification in Italy-CEE trade are presented. They provide evidence of the existence of relevant quality product differentiation between Italy and CEE, suggesting that the potential for displacement of low skill workers in Italy could be an issue also in the case of IIT.

3.1 – IIT and MIIT

It is generally believed that adjustment costs on factor prices are lower in industries characterised by high levels of intra-industry trade, as it is assumed that similar goods have similar factor intensity of production. IIT has been measured by the Grubel-Lloyd index. This was computed on trade flows at 8-digit level of industrial products, aggregating each product by means of a weighted mean for the entire economy. The weights used are the relative size of exports and imports of each product on gross industry trade. In this way, to a large extent, the aggregation problem, which afflicts the calculation of IIT, was avoided. The index is:

$$IIT_{jk} = 1 - \frac{\sum_i |X_i - M_i|}{\sum_i (X_i + M_i)} \qquad [2]$$

where *k* denotes trade between Italy and a partner or a group of partners; *i* denotes the 8-digit level product categories in manufacturing industries (11080 products in the Combined Nomenclature, CN); and *j* stays for industry. Data were then aggregated to the 3-digit NACE industry classification, according to the concordance table provided in the EUROSTAT COMEXT database and then, to allow for a sector analysis, further aggregated in macro-sectors according to the NACE-CLIO R.25 classification.

Row one of Table A.2 shows that IIT increases from about 32 in 1989 to 47 per cent in 1997 at 3-digit level. Already in 1992, IIT represented over 40 per cent of Italy-CEE trade. These high figures are not much different from those calculated by Drabek and Smith (1995) for trade between the EU and the Visegrad countries between 1988 and 1993. The figures would suggest that Italy-CEE trade is similar to trade typical of advanced trade partners with a similar factor endowment. However, as Drabek and Smith (1995) point out, within NACE 3-digit industries there are still differences in the nature of the products traded and, as a result, there may be trade-

induced substitution effects between low and high skill products. Moreover, the difference between the 8- and the 3-digit statistics may hint the presence of OPT.

Our analysis seems to confirm this observation, since the share of IIT at 8-digit level of the CN (row two of Table A.2) is less than half that at 3-digit level. When computed at a product level (8-digit CN), the GL is supposed to provide the most accurate measure of IIT. In fact, this is the lowest possible level of aggregation, at which we can be confident that we are considering a two-way trade in similar goods and that other types of spurious IIT, such as OPT, are excluded. Table A.2 shows that the share of intra-industry in Italy-CEE trade was artificially low before trade opened, as a consequence of the narrow product range in both style and quality that existed in planned economies. So it is no surprise that this type of trade more than doubled after 1988, reaching about 23 per cent of total trade in 1997. Such a value appears sizeable, considering the very narrow definition of two-way trade adopted, but not very high if compared, for instance, with that relative to Italy-EU trade, which is about 40 per cent in 1995 at 6-digit level (Chart 5)[8].

Chart 5 provides GL values computed at 6-digit level of the CN, a slightly higher level of aggregation than the 8-digit one. The chart considers not only Italy's trade with CEECs, but also that with a number of other trade partners, such as the NICs, EU-12, EFTA, extra-EU and the world. Inspection of the chart confirms the impression that the shares of IIT in Italy-CEE trade increased at a fast pace over transition. Already in 1991, the level of Italy-CEE IIT (17 per cent) had become higher than that between Italy and the NICs (16 per cent). This seems consistent with the fact that

[8] Celi and Smith (1998) find a value of the GL of about 23 per cent at 8-digit level in 1993 in the case of trade between Italy and a group of non advanced countries. This comprehends all the non-EU countries, including the CEECs and the NICs, but excluding the most advanced countries, such as USA, Japan, Canada and so on. Moreover, they find that the value of the same index almost doubled (43 per cent) when computed at 3-digit level in the same year.

geographical proximity plays a relevant role in the expansion of IIT[9]. It is less likely that it provides evidence of a higher similarity and convergence between the Italy' and CEE economies with respect to NICs.

There are other reasons why it is unwise putting much emphasis on the increase in the *level* of IIT registered. As many studies have pointed out, a dynamic version of the Grubel-Lloyd index is needed to actually be able to measure the growth in IIT over time. Only from the calculation of the IIT generated recently it is possible to infer information about the quality upgrading, the variety range developed in the productions of transition economies and the implications for structural adjustment involved in trade expansion.

Dynamic indicators of IIT have been proposed by various authors (such as Hamilton and Kniest; 1991; Greenaway, Hine, Millner and Elliot, 1994; and Azhar, Elliott and Milner, 1998). The formulation by Brülhart (1994) to compute indexes of IIT growth has been deployed here. It is based on changes in trade *flows* instead of trade *levels*. Trade balance is expressed as the absolute value of the difference between the variation in exports and the variation in imports. Total trade is given by the absolute values of the variation in exports summed to the absolute value of the variation in imports. In this way, a more precise indication of the extent to which new export (import) flows are matched by import (export) flows of similar products is achieved.

$$MIIT=A_j=1-\frac{\left[\left|(X_t-X_{t-n})-(M_t-M_{t-n})\right|\right]}{\left|X_t-X_{t-n}\right|+\left|M_t-M_{t-n}\right|}=1-\frac{\left|\Delta X_i-\Delta M_i\right|}{\left|\Delta X_i\right|+\left|\Delta M_i\right|} \qquad [3]$$

[9] The importance of geographical proximity is well documented. Balassa and Bauwens (1987) claim that one of the reasons of the importance of vicinity is that IIT involving the mutual exchange of different varieties of similar goods requires a larger information flow than inter-industry trade. They show empirically that membership in a regional trading arrangement itself do tend to increase the level of IIT.

This represents an improvement on the G-L index, which is a *static* indicator. In fact, the GL index increases also in presence of an increase in one-way trade, when this last reduces trade imbalances. In Table A.2, the levels of total IIT and the growth of IIT (MIIT) computed at 8-digit level for trade between Italy and CEE-8 over the period 1988-1997 are compared. It appears that the *changes* in trade attributable to IIT from one year to the other are below the *levels* of IIT registered in the final year, which proves that the static GL index is not a good measure for the actual change occurred in IIT. Moreover, we find that IIT increased in the most recent years at a faster pace than in the early 1990s.

3.2 – Horizontal and vertical intra-industry trade

An increase in IIT does not necessarily reflect a process of upgrading of CEE productions. In fact, the G-L index might simply be capturing the increasing exchange of low- for high-skill products within sectors. In other words, rather than models which stress the potential for trade driven by scale economies and variety (Krugman, 1979; Helpman, 1981), which is relevant between industrialised countries sharing similar technologies, the main reference here could be the literature which explains the division of labour in the production of different varieties of the same good according to a factor endowment approach. The theoretical models underlying this assumption are Falvey (1981), Kierzkowski (1984), Flam and Helpman (1987), Feenstra and Hanson (1995). In these models, each sector is modelled as containing a continuum of techniques. Factor substitution within sectors occurs at the level of the individual product, with the factors of production being represented by skilled and unskilled labour, which are both necessary in the production of each variety. In this way, there is a rich range of substitution effects, for products are distributed on a spectrum of

skill intensities. Countries tend to specialise in different parts of the spectrum depending on their ratio of skilled to unskilled wages.

In fact, a number of studies point to the presence of relevant price-quality gaps between the productions involved in EU-CEE IIT. For instance, Drabek and Smith (1995) find that the unit values of EU exports to CEE are much higher than the unit values of EU imports from CEE all over the years from 1988 to 1993. Moreover, they find that, with the exception of Hungary, the unit values of EU imports from the CEECs have fallen since 1988. They interpret this finding observing that increasing quantities have been redirected from the CMEA markets reducing both prices and average quality levels. Along the same lines of analysis, Landesmann and Burgstaller (1997) find very high price/quality gaps and a little representation of CEE producers in the high-quality segments of trade with the EU. However, this picture is not uniform across the different East European countries as a group including Hungary, Slovenia, Poland and Czech Republic register positive shifts in opposition to the negative performance occurred to Romania, Bulgaria, Slovakia and Russia. Moreover, Aturupane, Djankov and Hoekman (1997; and 1999) find that the vertical component of EU-CEE IIT ranges between 80 and 90 per cent all over the period from 1990 to 1995.

In what follows, measures of product heterogeneity within trade flows at an intra-industry level are given relative to Italy trade with CEE over the years from 1988 to 1997. As far as we know, this is evidence unavailable in the literature. To such an end, the standard G-L index of IIT has been split into horizontal and vertical components. The methodology followed is that proposed by Greenaway *et al.* (1994). In other words, vertical (horizontal) IIT has been calculated measuring two-way trade whose per kilogram unit value of exports relative to its per kilogram unit value of imports falls outside (within) a specified range ($\pm\alpha$) around the value of 1. To check for

the robustness of the results, two dispersion criteria have been used for unit values, i.e. α equals 0.15 and 0.25.

The procedure attempts to control for OPT and other aggregation problems. Firstly, the unit values of exports and imports have been calculated by dividing the value of exports (imports) in ECU by the weight in kilos at the 8-digit level of the CN classification. Then, the ratio between the unit values of exports and imports of products in the same digit-class has been computed. Once IIT has been separated into the horizontal and vertical components at the 8-digit level, trade flows have been aggregated by a weighted mean to compute vertical and horizontal IIT at the 3-digit industry level. The high level of disaggregation (8-digit) makes us able to compare goods that are very similar. It can hence be assumed that any eventual price gap between imports and exports which makes up the overlapping trade in that product derives from differences in quality and not in raw materials or factor requirement.

Moreover, within the share of vertical IIT (VIIT), it has been distinguished which percentage is positive (negative) vertical trade, namely which share is compounded of goods in which the exporter, Italy, has unit values of export flows toward CEECs by at least 15% greater (lower) than the unit values of imports. A further distinction of unit ratios in those below (vertical negative) and those above the specified range (vertical positive) has allowed to assess whether the price, and therefore, as a proxy, the quality of the Italian exports was higher or lower than that of the trade partner. This is considered a signal of higher (lower) quality of exports compared to imports.

Two key assumptions characterise the method described above: the first is that prices (unit values) reflect quality differences; the second is that the prices, in turn, can be proxied by unit values. The rationale behind the assumed equivalence of price and quality is that in presence of perfect information, a variety sold at a higher price must be of higher quality than a

variety sold more cheaply. The assumption of perfect information is not necessary, in fact, it has been shown that, even under imperfect information, prices will tend to reflect quality (Stiglitz, 1987). However, it has also been observed that, in the short run, for various reasons (ignorance, inertia and cost of switching supplier), consumers may buy a more expensive product. Therefore, in the short run, prices must be considered imperfect indicators of quality. Due to the lack of valid alternative measures, prices remain the most used proxy in studies of quality in international trade (Rodrik, 1988; Saunders, 1986; Torstensson, 1991; Abd-el-Rahman, 1991; Greenaway, Hine and Milner ,1994a; and 1995; Aiginger, 1997; Fontagnè, Freudenberg and Pèridy, 1998).

As for the use of unit values as proxy for prices this also entails some problems. It implies choosing alternatively unit values per tonne, per square metre or per item. The first two measures are complicated by the fact that they depend on the level of heaviness of the good considered. Secondly, by interpreting unit value differences as quality differences, one implicitly assumes all heterogeneity of the commodity group as quality differentiation even when different goods are aggregated under one statistical heading. Therefore, choosing a very detailed aggregation is of the utmost importance. Besides, if unit values are used as an indicator for the assessment of the competitive position of industries, some confusion may arise from the fact that they are both an indicator of price competitiveness and one of quality or non-price competitiveness interpreted as higher value-added per physical unit. On the one hand, unit values are related to prices, costs and productivity; on the other hand, they are related to the concept of quality. In fact, the unit value is defined by nominal output per material embodied in the final product ($P*Q/M_u$). Therefore, it can be considered quite similar to partial productivity, with the difference that the numerator is expressed in nominal terms and the denominators contains the material input, instead of labour or capital. But as the numerator is expressed in nominal terms, this

indicator is much more than a simple productivity index: it is more quality oriented as it incorporates a number of quality factors such as the premium for higher sophistication, for related services, for advertising and so on.

The decomposition of IIT into its three components tells us to what extent changes in the industrial structure have taken place in Eastern firms over transition and how close is their type of specialisation to that of Italy. In turn, this kind of analysis provides relevant information on the potential displacement effects of trade on the productions and labour markets of the two partners.

Table A.10 gives the results of our calculations for Italian trade with a group of CEECs using the most restrictive value of α, i.e. 0.15. It shows that all over the period considered VIIT is by far the most important component of Italy-CEE IIT for all the countries considered. In 1995, the percentage of vertical IIT ranged between about 65 (Poland) and 90 (Bulgaria) per cent of total IIT. Not surprisingly, considering the peculiar specialisation pattern of Italy compared to the EU, our value is a little smaller than that relative to EU-CEE trade (80-90%), found by Aturupane, Djankov and Hoekman (1997; and 1999) at 6-digit of the CN. Moreover, within VIIT, the positive component represents the highest share for all the 6 CEECs considered, except for Bulgaria (49%). The results change in size, but not in direction using a bigger value of α.

Regarding the evolution of IIT shares, our findings suggest that each component of IIT increase over the period, together with the aggregate level of IIT. Moreover, positive VIIT for Italy tends to become a share more and more important of total IIT at 8-digit level. Overall the figures would confirm the impression that much of the expanded trade of Italy *vis-à-vis* CEE is due to a redirection by CEECs towards EU markets of goods, which were once destined to the CMEA markets (distressed trade), with a consequent reduction in prices and average quality levels (Drabek and

Smith, 1995)[10]. It is worth noticing though that at least in some cases, such as that of Poland and Hungary, HIIT tends to become relevant components of total trade with Italy, suggesting that the degree of economic integration with these trade partners be higher.

A comparison between Italy's IIT with CEE and that with other competitors is given in Chart 6 in the Appendix. They provide a benchmark in the analysis. A dualistic pattern of specialisation of Italy appears. Whilst more than 80 per cent of total vertical trade with the CEECs and about 70 per cent of trade with NICs is vertical positive IIT, i.e trade in which the quality position of Italy appears stronger, the opposite holds in trade with EU and EFTA countries. In this case, a percentage of more than 70 per cent in 1988, shrinking to not less than 65 per cent in 1995, has the lowest price (negative vertical IIT). This reflects the atypical position of Italy in the international division of labour. The Italian economy differs from that of other developed economies as, in spite of a high per capita income, it has a level of factor endowment and trade specialisation quite dissimilar from that typical of the more advanced economies. Especially the endowment of qualified and skilled work is far lower than the level typical of the most advanced countries, such as USA and Japan, and lower than most European countries. As a result, the Italian specialisation, being especially concentrated in traditional industries and showing a marked weakness in the most high-tech and know-how intensive activities, appears unable to compete in the same kind of productions as the northern Europe partners[11].

As vertical IIT is generally considered to generate from technology and factor endowment gaps, decomposition of IIT between Italy and CEE suggests that a standard factor proportion type of trade is also present within

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[10] Our findings contrast, instead, with those of Aturupane, Djankov and Hoekman (1997; and 1999) of a relative stability of IIT shares in EU-CEE trade at 6-digit level of the CN.

[11] Regarding the specialisation of Italy in international trade see De Nardis and Paterno' (1997) and for an analysis of regional differentiation in Italian trade and labour market see D'Antonio, Scarlato and Zezza (1995); and D'Antonio and Scarlato, (1996; 1997).

intra-industry trade. The conclusion is that both inter- and intra-industry trade may have some worrying implications for production, factors' remuneration and employment. If two-way trade is also driven by a competition based on differences in factor endowment and in technology, it will reinforce the effect of the inter-sectoral trade along H-O lines. In other words, it will reduce income and employment for the less specialised Italian workers and, at the same time, will lead to a more difficult process of re-valuation for the human capital of Eastern economies.

3.3 – Revealed comparative advantages of quality in trade

In this section, we introduce a new index to measure the relative specialisation of two trade partners in different segments of quality. We call it index of Revealed comparative advantages of quality (RCAQ), as it measures the comparative advantage of each partner in trade of a low, average or high quality than that of the partner.

The index has been built through the following steps. First, a measure of price gap with respect to the average sector price of imports / exports has been calculated, taking a ratio between the unit price of Italy-CEE exports / imports of good *i* belonging to sector *j* and the average price of Italian imports / exports in the same sector *j*.

$$UVGAP_{\exp,i,j}=UV_{\exp,i}/\overline{UV}_{\exp,j} \text{ and } UVGAP_{imp,i,j}=UV_{imp,i}/\overline{UV}_{imp,j}, \qquad [4]$$

where the superscript variable represents the sector average at 3-digit level. Then, a three-category dummy has been defined for imports and exports, adopting a range of variation for the above ratios of 0.25%. Products of low quality are set in correspondence of values of the above ratios lower than 0.75; products of average quality in correspondence of ratios included in the range 0.75 and 1.25; products of high quality are set in correspondence of ratios higher than 1.25. The final step has consisted of

applying the RCAs formula, but calculating it on aggregates of trade based on the share of trade of these three types: lower quality than the partner, quality close to that of the partner and quality higher than that of the partner: $RCAQ_n = \frac{\frac{X_n}{X} - \frac{M_n}{M}}{\frac{X_n}{X} + \frac{M_n}{M}}$ where RCAQ stays for revealed comparative advantages of quality, n=1,2,3 stays for quality ranges with n=1 for lower quality than the partner, n=2 for similar quality as the partner, n=3 for higher quality than the partner.

The results of our calculations are provided in Chart 8. The figures refer to Italy-CEE-6 total trade relative to 1988, 1992 and 1995. It appears that Italy has strong comparative advantages on CEE competitors in exporting goods of higher quality than those imported (the Italian RCAQ index is always positive in this category). These advantages have slightly reduced in 1995 compared with 1988, but they are still very high. They are also much bigger than the comparative advantages obtained by Italian firms in the export of products of quality similar to that of CEE competitors. Conversely, high comparative disadvantages in exports of comparatively lower quality goods are reported with values around minus 0.4 and with only a negligible decrease.

4 – A sectoral analysis of IIT

On the basis of the sectoral trends shown in recent years by both the static and the dynamic indicators adopted in the previous section, IIT is high and is likely to increase in the near future in Textile, clothing and footwear (12), Office and data machinery (8), Transport equipment (10), Electrical engineering (9), Rubber and Plastic Products (15) and Other manufactured products (16). These sectors have all been characterised by both high IIT

(Chart 6a and 6b[12]) and MIIT values (Chart 7a and 7b). Quite surprisingly, except for number 12, the aforementioned sectors are those where Italy has higher RCAs. This gives an impression of rapid catching up by the CEECs in high-tech, high human capital productions.

In detail, it can be noted that IIT in Textile and clothing (12) has undergone a steady increase up to 34 per cent in 1997 from the previous share of only 17 per cent in 1988 (Chart 7b). Transport equipment (10) has also climbed from 25 to 30 per cent over the period[13]. IIT in Agriculture and industrial machinery (7) has been growing from 14 to 22 per cent (Chart 7a). Also two high-tech and human capital intensive productions, such as Electrical engineering (9) and Office and data processing machines (8), have experienced quite significant increases in IIT. Especially in the latter sector, IIT has jumped to 28 per cent from 11 per cent in 1988. More specifically, in table A.3-A.8 the top thirty 3-digit industries with the higher percentage of IIT on total trade are ordered for the period 1988-1997. Similar industries are leading the race in the six countries and most of them belong to traditional sectors or to sectors which use physical capital more intensively.

An explanation for this high level of IIT is provided by the existence of a dominant vertical trade within industries. As shown in Chart 7a and b, horizontal IIT, although in expansion, is a very marginal portion, concentrated around 2-3 per cent and never above 10 per cent of total trade, the only exception being represented by Transport equipment (10) (about

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[12] For a better understanding of Chart 6, notice that IIT is the sum of HIIT, VIIT(+) and VIIT(-), as explained in detail in the next section.

[13] Graziani (1994b, p. 469) points out that, in the sectors 10 and 12, an acceleration of de-localisation, contractual arrangements and franchising operations has been observed. For example, in the case of the large FIAT investment in Poland which has enhanced intra-firm trade (in the form of exports of Italian motors against Polish cars), the author finds evidence of the firm's strategy of locating the production of all components closer to the assembly line to rationalise the productive process. In the future, this is likely to generate much greater flows of Italian imports than export in such a way that the high IIT levels observed would shrink.

20% in 1997) and Textile (12) (about 12% in 1997). On the contrary, vertical trade with higher quality for Italian producers (positive VIIT) represents up to 45 per cent of total trade in the case of Office and data processing (8) in 1992 and is generally higher than 15%. Table 4 provides a summary description of the main trends and differences across sectors[14].

Tab. 4 – Summary measures of trends and differences in IIT across sectors

IIT by sectors compared to average total IIT over 1988-1997	
Sectors with IIT below the average (19.82)	1, 2, 3, 7, 11
Sectors with IIT around the average	6, 13, 14
Sectors with IIT above the average	4, 5, 8, 9, 10, 12, 15, 16
Trends in IIT over 1988-1997	
Sectors with increasing IIT	1, 2, 7, 8, 9, 10, 12
Sectors with static IIT	3, 4, 5, 13, 14, 15
Sectors with declining IIT	6, 11, 16
Type of IIT by sectors	
Sectors with dominance of HIIT	2, 3
Sectors with dominance of VIIT(+)	1, 4 - 16
Sectors with dominance of VIIT(-)	none
The 5 sectors with the highest share of HIIT in 1995	10, 2, 9, 1, 12
The 5 sectors with the highest share of VIIT(+) in 1995	8, 12, 15, 14, 9
The 5 sectors with the highest share of VIIT (-) in 1995	3, 12, 5, 11, 4

Source: own elaboration on COMEXT database.

Chart 9 gives measures of the index of RCAQ for 14 sectors (Nace R-25) in 1988, 1992 and 1995. The sectoral picture confirms the tendency of Italy to have comparative advantages in products of average and high quality levels, but with some exceptions. In 1992 and in 1995 there are some sectors in which Italy gets positive comparative advantages also in lower quality segments. These are the sectors of Agriculture (1), Energy (2), Agriculture and industrial machinery (6), Electrical goods (9), Transport equipment (10), Food (11) and Other industries (16). This may be because the CEECs also tend to import low quality products due to the still strong

[14] The underlying statistics are based on author's calculations and are available on request.

dependence on foreign trade to get many consumer goods, such as vehicles, machinery, and food.

However, the analysis of two-way trade has also confirmed that the Italian "sensitive" productions, which seem those more in danger because of the competition of the CEECs, are mainly exploiting a qualitative advantage and compete in different segments from those of the CEECs.

Overall, the sectoral analysis suggests that the Eastern Europe producers are getting market shares on Italy and EU markets mainly by means of lower quality exports and of a price advantage. From the point of view of Italy, the key role of positive VIIT confirms for the case of CEE a competition strategy followed by Italian firms in international markets over the 80s, highlighted. Following a restructuring process, they have tended to specialise in upper stage niches, while increasing imports of lower quality and lower value added products, particularly in productions related to sectors such as leather, clothing, footwear, knitting, woven fabrics, electric equipment. In these sectors, trade liberalisation with the CEECs will encourage production and trade to concentrate on upper market commodities (Graziani, 1994b; Celi and Segnana, 1998; Petrucci and Quintieri, 1998; and 1999).

5 – Employment effects of vertical trade

This section attempts to investigate the relationship between different types of trade and skill content across sectors of industry. In particular, an equation will be estimated to test whether the specialisation in low (high) quality segments and the low (high) percentage of inter-industry trade in a given sector are associated with a lower (higher) level of employment for the most skilled workers. This has important implications both for the large stock of skilled capital which has been widely attributed to the CEECs and

also for the position of the less skilled workers in the Italian sectors most penetrated by trade with eastern Europe.

Within the neo-H-O framework, vertical intra-industry trade is associated with relevant structural adjustments. In fact, trade between low and high quality products is trade in goods which have different contents of skilled labour and capital and, hence, entails shifts in employment and remuneration of different factors, such as capital, skilled and unskilled labour (Falvey, 1981; Falvey and Kierzkowski, 1986).

If this holds true, industries characterised by high and increasing levels of IIT would experience low adjustment costs only as far as the horizontal component (HIIT) is concerned, whilst the vertical two-way trade (VIIT) component impacts on the labour market.

To test this proposition, following Celi (1996)[15], an OLS cross-section of the skilled-unskilled ratio (measured by the ratio between number of non-manual and manual workers[16]) in 103 3-digit NACE industries (INDE data-set) has been run on trade variables, distinguishing four types of trade, and using other industry variables. The measures of trade relative to 1995 are the shares of inter-industry trade (IT), of horizontal IIT (HIIT), of vertical two-way trade in higher quality (VIIT+) and in lower quality (VIIT—)[17]. A number of proxies have been used for the industry variables. For market structure, the number of firms is used. The level of product differentiation is proxied by the number of 8-digit products in a 3-digit category. The ratio of investment to added value measures the degree of innovation. The expenditure in R&D per firm is used for the research and development

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[15] Celi (1996) carries out a similar test of the relationship between vertical intra-industry trade and skill intensity across industrial sectors applied to EU-Extra-EU trade.

[16] It should be noted that the proxy used is not completely satisfactory. As observed in Smith (1998), in both groups of manual and non-manual workers, there are "skilled" individuals.

[17] The indices of quality product differentiation are based on the definition contained in section 3. They are calculated at 8-digit CN level and aggregated for 103 3-digit NACE industries. The estimates are based on 96 observations due to missing values.

performed in the industry. The capital-labour ratio proxies the capital-intensity and the level of turnover per firm proxies the economies to scale. Finally, quality product differentiation is measured by the unit value ratios in Italy-CEE trade.

The estimates, presented in Table A.12, show significant coefficients for IT and VIIT(+), confirming that there are employment effects related to both inter-industry trade and to vertical intra-industry trade. The first effect can be explained with the Stolper-Samuelson theorem and assuming that Italy has mostly trade deficit with the CEECs in sectors characterised by low skill intensity and trade surpluses in high-skill intensive productions. As for the latter, it is consistent with a neo-H-O model of trade as in the Falvey and Kierzkowski (1987) model. Conversely, HIIT appears not significant, which appears consistent with the hypothesis of neutrality of IIT typical of monopolistic competition models. The share of vertical lower quality trade of Italy with CEECs shows insignificant coefficients but this may be due to the scant variability of this regressor across the sample.

A Wald's test carried out on the coefficients of the variable for vertical positive intra-industry trade and for the measure of inter-industry trade does not let reject the hypothesis that the coefficients of these two variables are not significantly different from each other. This suggests that a quality differentiated IIT may yield employment effects equal to those stemming from inter-industry trade as described by the Stolper-Samuleson theorem. Albeit tentative, the finding provides an empirical answer to an issue left largely unexplained in the theoretical literature.

Furthermore, the expected positive relationship between the percentage of skilled workers and the expenditure in R&D and the capital intensity of the industry is verified. Conversely, the inverse relationship with the degree of competitiveness seems to provide evidence in favour of small sample models on the determinants of the skill-intensity of the industry: in other word, the higher the degree of competitiveness the lower the use of skilled

workers[18]. Finally, the degree of product differentiation, the presence of economies to scale and the level of innovation are non-significantly different from zero and with the wrong sign.[19]

From the previous analysis, it is possible to infer that non-neutral effects might be highly correlated to the high and growing share of intra-industry trade in different quality levels. As a consequence, in traditional labour intensive sectors, where the CEECs have reached the highest penetration of Italian markets, we should assist to a deterioration of the position of manual workers, as a result of increased vertical intra-industry trade and of the still relevant share of inter-industry trade. The impact of vertical trade on unskilled workers is because Italy tends to shift to upper quality productions, whose jobs present higher coefficients of skill intensity than those typical of low quality productions.

Addressing this issue seems particularly important, considering the fact that in a long-term perspective the degree of interaction with the transitional economies of Central and Eastern Europe appears a relevant phenomenon capable of a significant acceleration. Furthermore, in the last 15 years, together with an increasing level of participation in international trade and similar to most European countries, Italy has experienced a clear deterioration of the employment possibilities of less skilled workers in the manufacturing sector.

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[18] See Shaked and Sutton (1984).

[19] This most probably has to be attributed to the scarce robustness of the proxies used. As pointed out by Greenaway *et al.* (1995), especially product differentiation is very difficult to assess and the most used proxy, which is the one adopted also here, is very weak. Then, quite puzzling is the negative sign for the economies to scale variable: it might be due to a not appropriate proxy. Finally, the negative sign of innovation is also explained with the fact that the measure employed, which is the flow of investment in a single year as a proportion of the added value ratio, is quite inappropriate for measuring a variable of stock such as innovation.

Conclusions

This paper has been an investigation on the structure of trade between Italy and CEECs all over transition. Over the years from 1988 to 1997, the Italian sectors that are benefiting more from the CEE opening up are those based on R&D and on skill intensity. Conversely, as shown by the evolution of comparative advantages, the most penalised sectors are those, which use proportionally higher shares of physical capital and labour, such as Metal products, Wood and furniture, Textile, Paper and Chemicals. This is a consequence of the inherited specialisation of the CEECs in capital intensive sectors, which adds up to the exploitation of new comparative advantages in labour intensive sectors due to the abundance of cheap labour.

An econometric test of whether factor endowment differentials are an important determinant of the trade developed after the opening up of CEE economies provides evidence in favour of this hypothesis. There is also some evidence of a shift of these countries towards more labour intensive productions. Moreover, the prediction made at the beginning of transition that CEECs would specialise in skill-intensive productions is not confirmed, although signs of improvement are found.

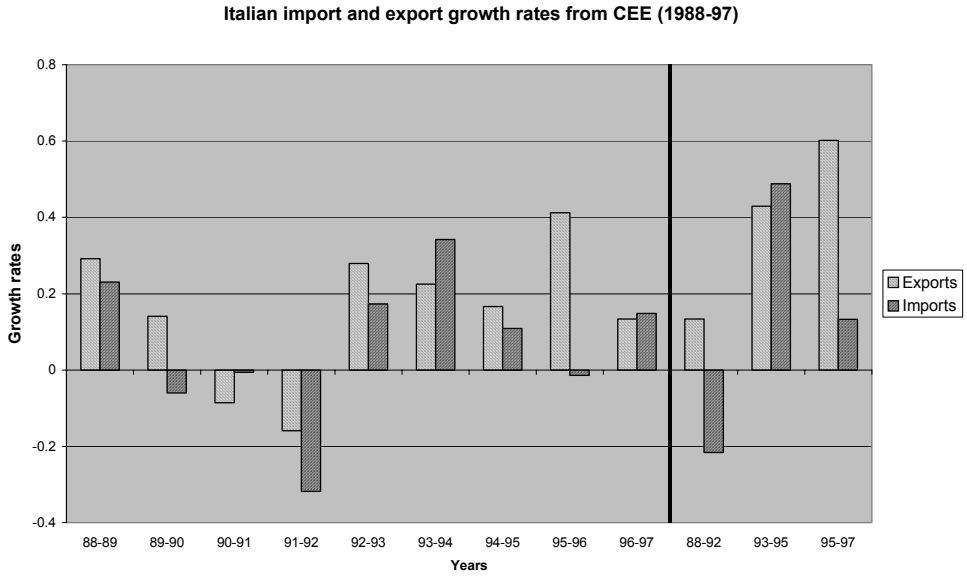
This picture does not change substantially when the increasing proportion of intra-industry trade is taken into account. This type of trade might be considered as a signal of rapid catching up and of a rich skill-endowment of the transition economies. In fact, disentangling the horizontal and vertical components of IIT, it becomes apparent that trade in similar goods is mainly based on the concentration of CEECs on lower quality exports, as a reflection of high labour intensity and poor endowment of high-technology.

Moreover, various experiments have shown that over transition CEECs have continued to sell the same kind of products without undergoing substantial changes in the composition of trade. Finally, evidence has been

found in favour of the hypothesis that, being mainly based on factor endowment differentials, the current new trade Italy has developed with the CEECs is likely to affect the less skilled workers and the productions concentrated in more labour intensive and lower quality segments. This proposition has been verified by regression analysis.

Appendix A – Charts

Chart 1



Source: own elaboration on COMEXT database. Growth rates are calculated by comparing final and initial year.

Chart 2a

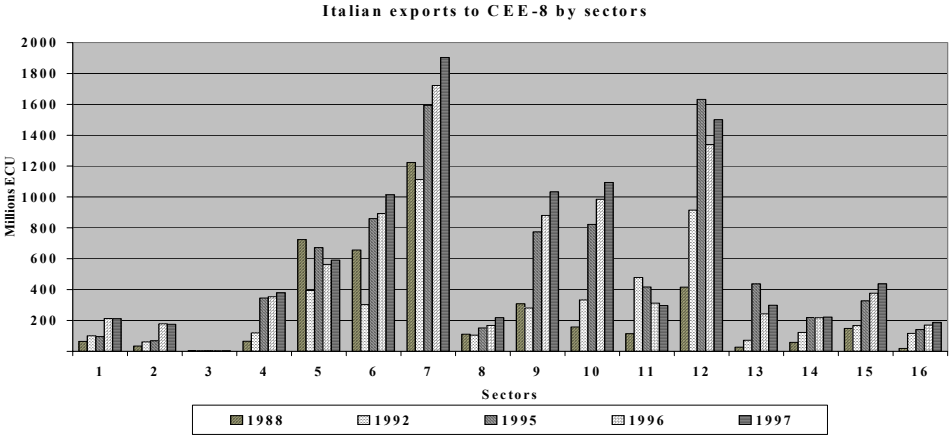
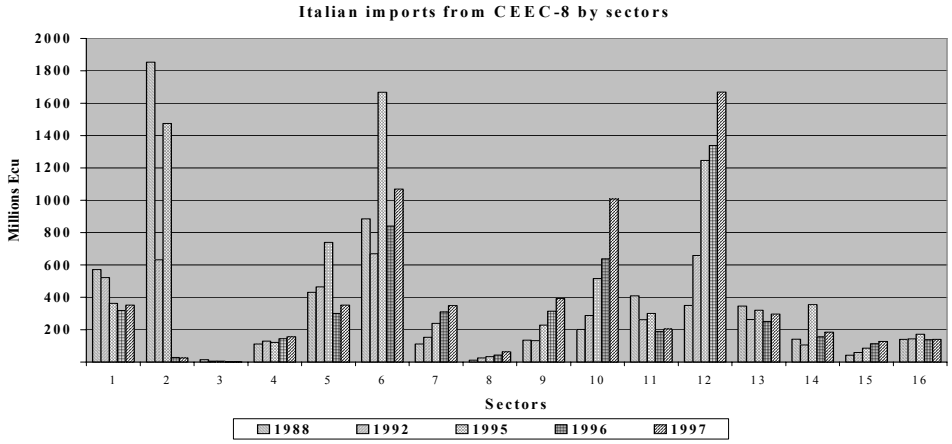


Chart 2b



NACE-CLIO R.25 classification

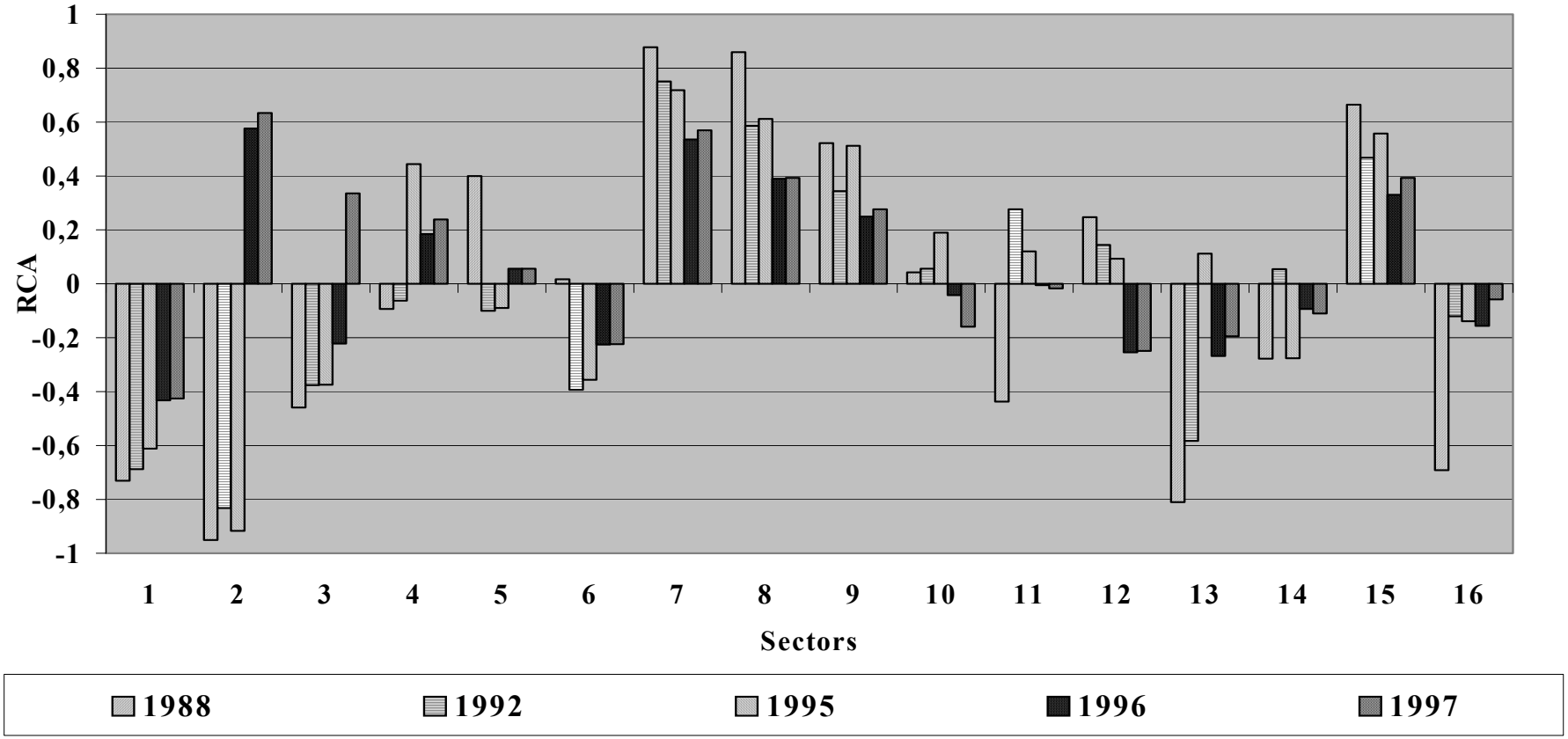
1	Agriculture and fisheries	9	Electrical Engineering
2	Energy	10	Transport equipment
3	Ferrous and non-ferrous ores and metals	11	Food, beverages and tobacco
4	Non-metallic minerals and mineral products	12	Textile and clothing, leather and footwear
5	Chemical and pharmaceutical products	13	Wood and wooden furnitures
6	Metal products	14	Paper and printing products
7	Agricultural and industrial machinery	15	Rubber and plastic products

8	Office and data processing	16	Other manufactured products

Source: own elaboration on COMEXT database.

Chart 3

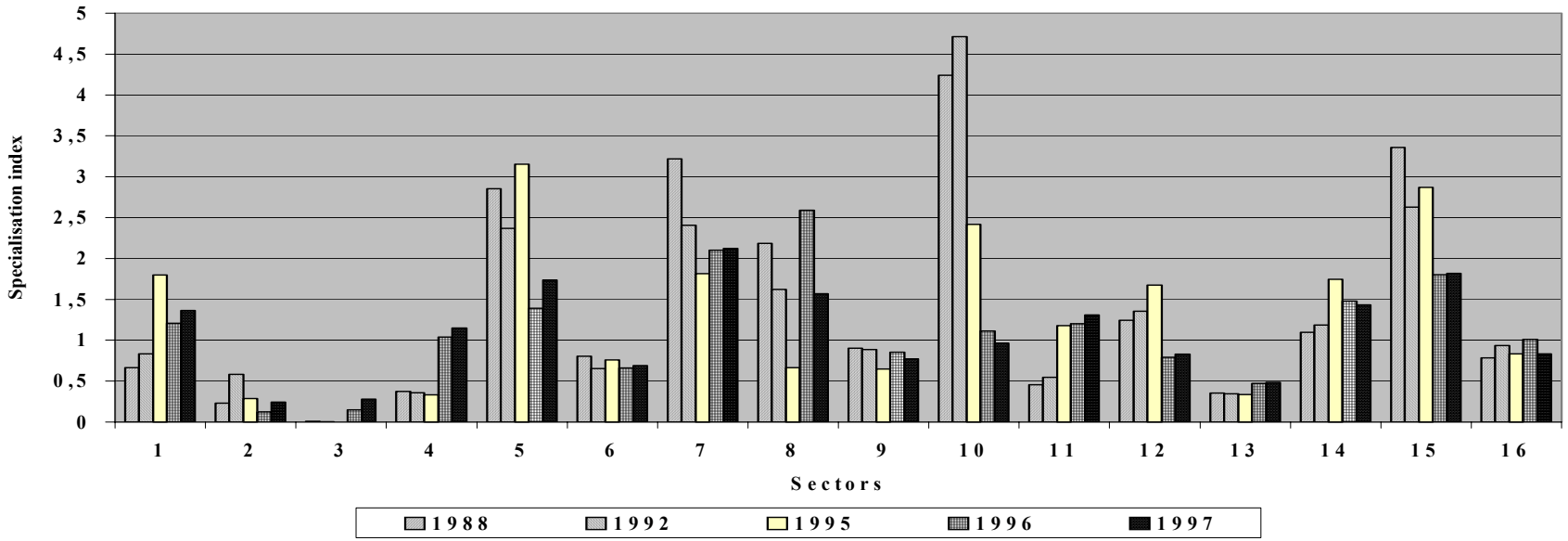
Revealed comparative advantages of Italy *vis-à-vis* CEE (NACE-CLIO R.25)



Note: the sectors are based on the NACE-CLIO R.25 classification, reported in the note to Chart 2. The adopted definition of RCAs is provided in section 1 of the main text.
Source: own elaboration on COMEXT database.

Chart 4

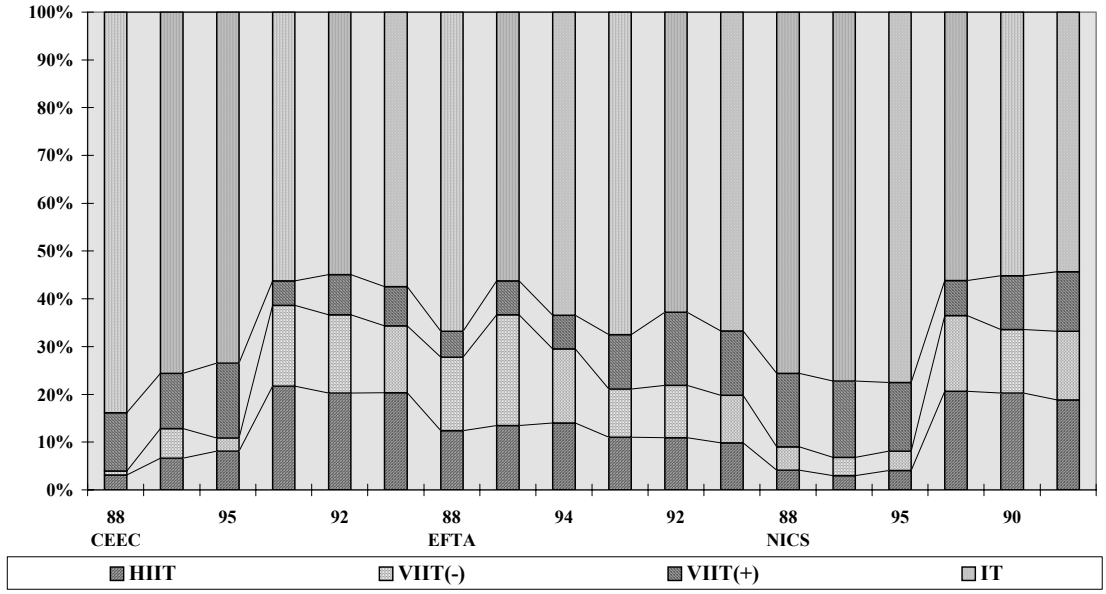
Export specialization indicators of Italy vis-á-vis CEECs on the EU-11 market by sectors (Nace-Clio R25)



Note: the sectors are based on the NACE-CLIO R.25 classification, reported in the note to Chart 2. The formula used is $S_{it} = \frac{X_{it}^{IT} / \sum_{i=1}^{16} X_{it}^{IT}}{X_{it}^{CEE-8} / \sum_{i=1}^{16} X_{it}^{CEE-8}}$ i = 16 NACE-CLIO sectors; t = 1988-92 and 1992-95; X_{it}^{IT} = Italian exports to the EU-11; X_{it}^{CEE-8} = CEE-8 exports to EU-11. S_{ij} = 1 if there is identity of specialisation; Sij < 1 if Italy is less specialised than CEECs in a determined sector; S_{ij} > 1 if Italy is more specialised than CEECs.
Source: own elaboration on COMEXT database.

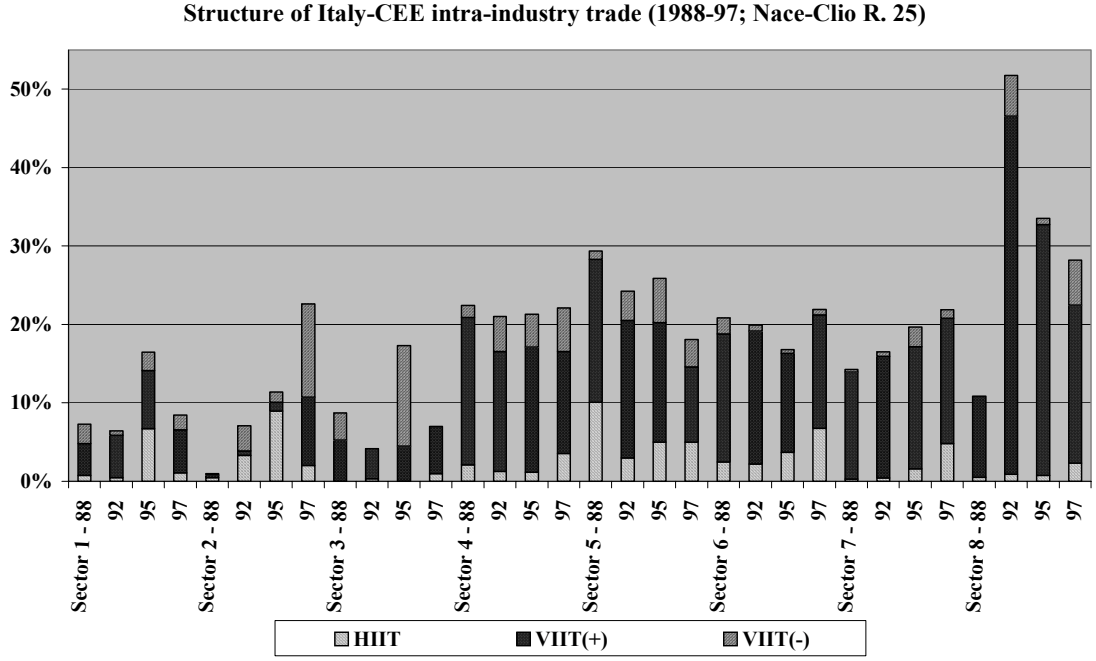
Chart 5

Structure of Italy's trade with different partners
(various years; %; a = 0.25; 6-digit CN)



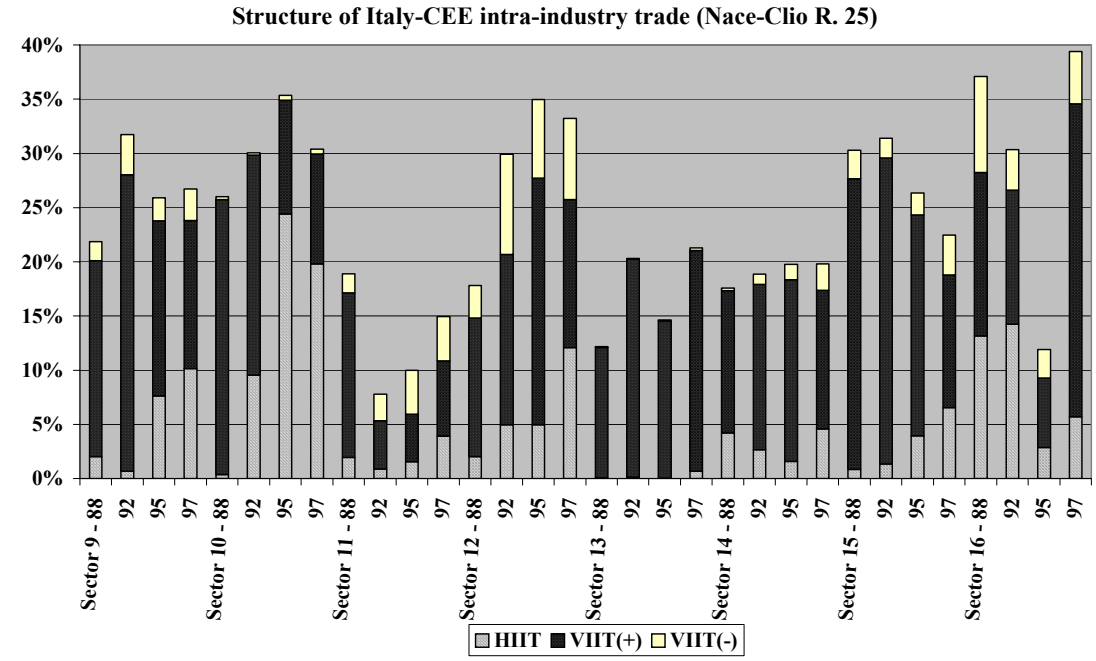
Source: own elaboration on COMEXT database.

Chart 6a



Source: own elaboration on COMEXT database.

Chart 6b



Source: own elaboration on COMEXT database.

Chart 7a

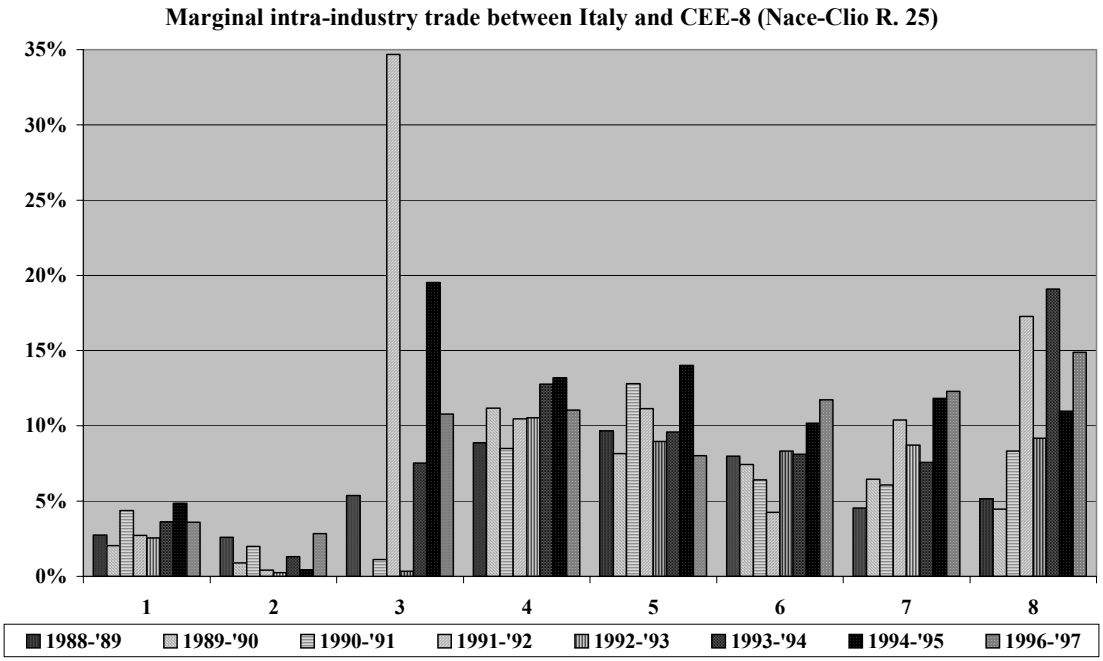


Chart 7b

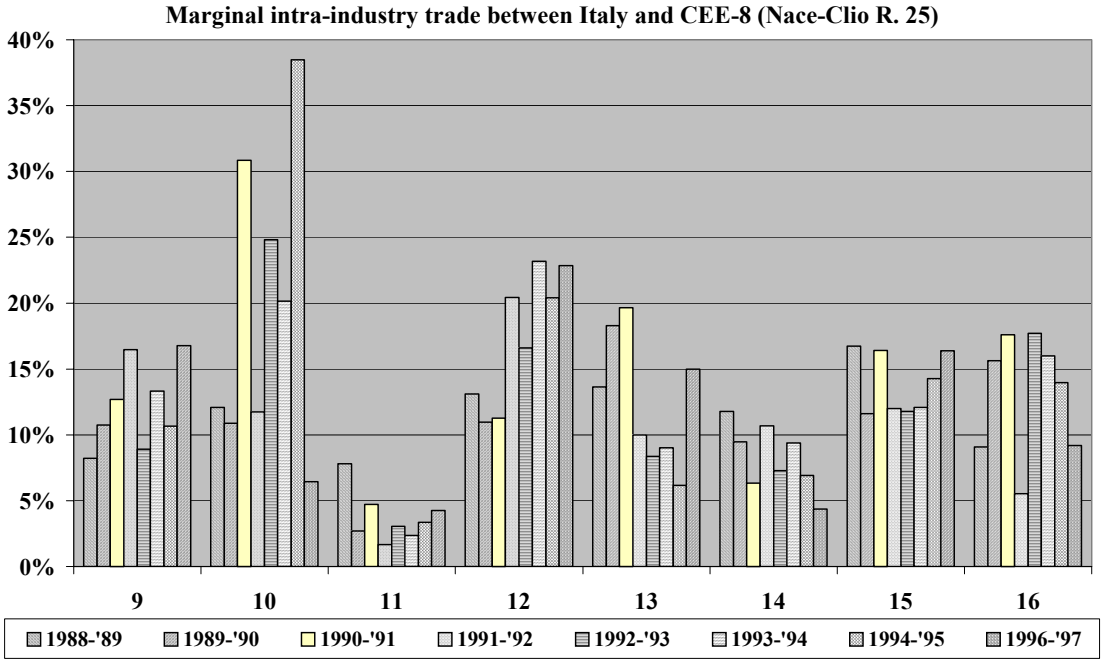
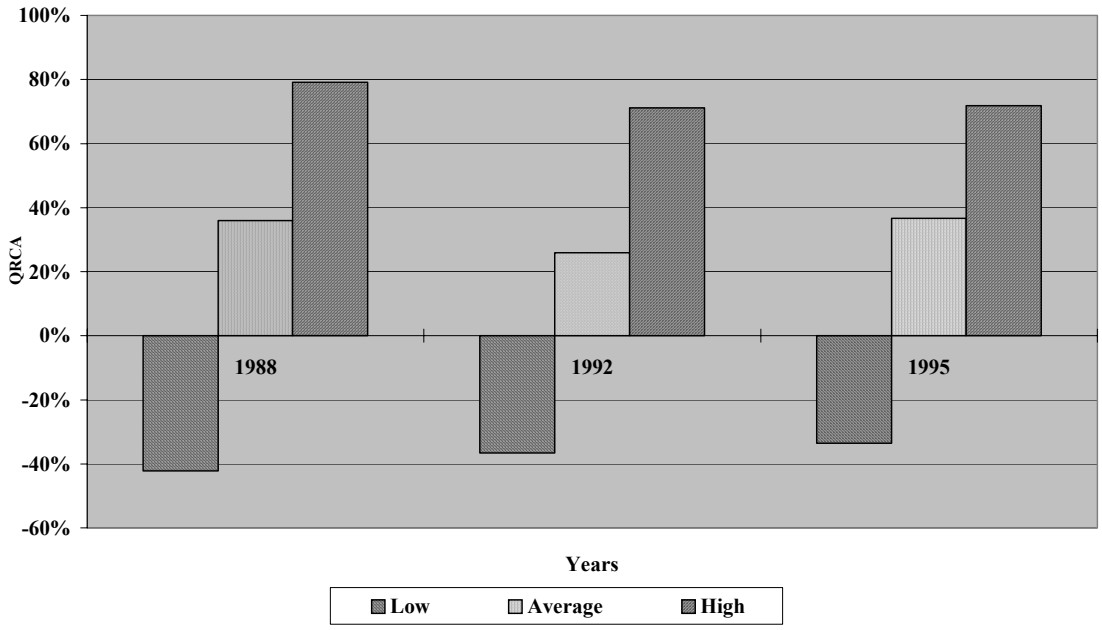


Chart 8

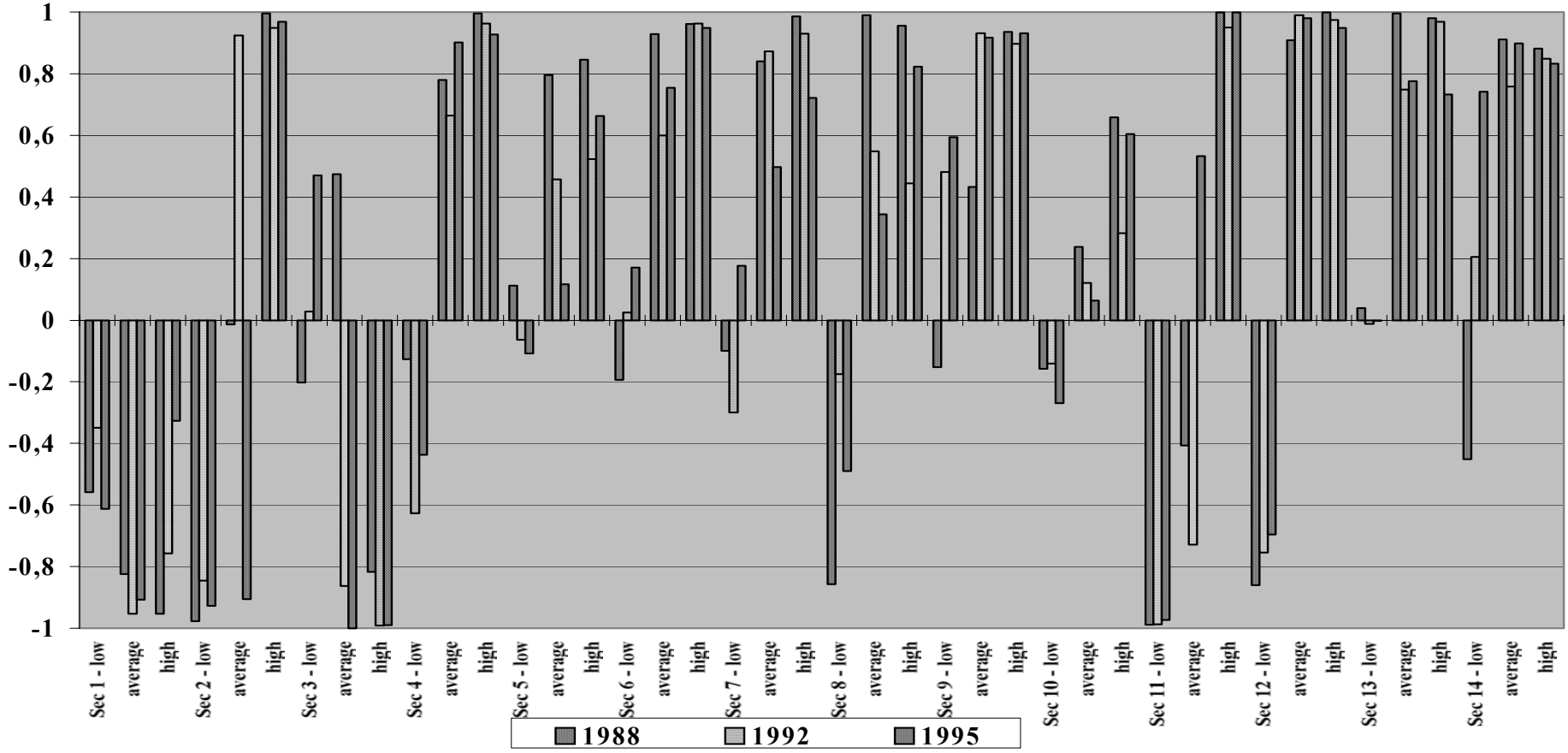
Italy-CEE-6: quality revealed comparative advantages



Source: own elaboration on COMEXT database.

Chart 9

Italy-CEE-6: quality revealed comparative advantages by sector



Source: own elaboration on COMEXT database.

Appendix B – Tables

Tab. A.1 - Main Eastern Europe's trade partners among European countries (percentage shares of EU imports and exports to CEE, based on 1000 ECUs)

	1989 EU imports (%)				1989 EU exports (%)			
Country	Italy	France	Germany	UK	Italy	France	Germany	U K
Poland	12.0	8.9	45.2	11.9	11.0	9.2	54.8	7.3
Czechosl.	13.0	9.3	46.6	10.0	10.5	9.5	56.3	8.4
Hungary	18.7	10.6	50.2	6.4	11.8	8.3	59.5	5.8
Romania	32.4	15.8	28.4	6.9	12.3	18.7	41.0	7.3
Bulgaria	20.3	12.0	28.9	10.2	17.0	9.7	48.7	8.6
Albania	36.0	9.2	27.7	1.2	38.7	5.3	31.3	2.3
Yugoslavia	32.9	8.2	43.6	4.6	24.7	10.1	50.3	4.5

	1993 EU imports (%)				1993 EU exports (%)			
Country	Italy	France	Germany	UK	Italy	France	Germany	U K
Poland	9.4	7.7	57.7	7.1	5.2	7.8	50.5	9.2
Czech R.	8.7	5.0	69.1	6.4	3.4	6.9	65.2	6.0
Slovak R.	14.8	5.9	65.4	8.0	5.0	6.4	59.7	1.1
Hungary	16.6	7.2	59.1	4.7	6.4	7.8	53.7	5.2
Romania	23.5	13.2	41.9	7.0	10.9	17.3	40.5	5.1
Bulgaria	17.3	11.6	29.5	9.6	11.3	8.5	34.9	8.0
Albania	61.5	3.0	12.0	0.7	26.6	18.6	9.0	1.7
Slovenia	20.3	15.5	54.1	3.0	15.8	14.4	41.9	2.4

	1997 EU imports (%)				1997 EU exports (%)			
Country	Italy	France	Germany	UK	Italy	France	Germany	U K
Poland	9.6	7.3	50.9	6.0	13.4	8.4	42.4	7.8
Czech R.	6.3	4.8	59.7	5.8	8.5	6.9	53.1	6.4
Slovak R.	13.1	4.3	53.2	3.1	12.3	7.1	48.7	4.0
Hungary	9.9	5.8	46.6	6.1	10.9	6.1	44.1	4.6
Romania	34.0	9.5	30.3	6.6	30.3	11.0	32.1	6.1
Bulgaria	25.8	6.9	21.5	6.5	18.2	8.1	30.6	6.1
Albania	61.4	1.3	8.4	0.3	34.8	1.6	6.7	2.1
Slovenia	22.9	8.8	44.1	3.0	27.9	14.2	29.0	3.3

Source: own calculation on COMEXT data.

Tab. A.2 –Total and Marginal intra-industry trade between Italy and CEEC-8 (1988-97)

IIT	*1988*	*1989*	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*
3-digit	.3295	.3209	.3435	.3876	.4436	.4238	.4126	.4207	.4916	.4727
8-digit	.1075	.1071	.1259	.1456	.1716	.1646	.1735	.1891	.2491	.2314
MIIT	*1988-89*	*1989-90*	*1990-91*	*1991-92*	*1992-93*	*1993-94*	*1994-95*	*1995-96*	*1996-97*	*1988-97*
	.0783	.0755	.0889	.0851	.0924	.1090	.1300	.2333	.1244	.1659

Note: the formulas used to compute IIT and MIIT are provided in section 3. The 3-digit level refers to the NACE and the 8-digit to the CN nomenclatures.
Source: own calculations on COMEXT data.

Tab. A.3 – Italian intra-industry trade indices with the CEECs (top thirty 3-digit Nace industries, 1997, as % of total trade)

Nace	*Description*	*IIT 1988*	*IIT 1992*	*IIT 1995*	*IIT 1996*	*IIT 1997*
427	Brewing and Malting	.1248	.5047	.7655	.4656	.7753
428	Soft drinks	.0101	.0000	.0000	.4487	.6254
326	Transmission equipment for motive power	.5628	.4360	.5080	.4795	.5660
242	Cement, lime and plaster	.0052	.0345	.4514	.3080	.5098
241	Clay products for constructional purpose	.3104	.4414	.4799	.5195	.5086
463	Carpentry and joinery components and parquet flooring	.0799	.1939	.3761	.3907	.5037
442	Leather and leather substitutes	.3794	.5186	.4425	.4992	.4948
361	Shipbuilding	.1513	.1112	.1230	.0407	.4756
436	Knitting industry	.2048	.4487	.4596	.4868	.4696
364	Aerospace equipment manufacturing and repairing	.0766	.1748	.1924	.2159	.4594
374	Clock and watches	.1180	.5661	.3269	.4644	.4411
162	Gaswork	.0041	.0039	.0822	.1837	.4376
372	Medical and surgical equipment	.1305	.3037	.3173	.3749	.4291
247	Glass and glassware	.1525	.2372	.3643	.4094	.4282
353	Motor vehicles	.0770	.0848	.2692	.3171	.4249
495	Miscellaneous	.1730	.3327	.4515	.4479	.4052
342	Electrical machinery	.1704	.2364	.3879	.3684	.4018
246	Grindstones and abrasive products	.2172	.1940	.3114	.2773	.3958
343	Electrical apparatus	.2206	.3675	.4217	.3615	.3901
494	Toys and games	.4020	.5126	.2747	.5738	.3814
462	Semifinished wood-products	.3737	.3506	.3147	.3971	.3807
453	Ready-made clothing and accessories	.1238	.2716	.3874	.3939	.3639
439	Miscellanoeus textile	.1677	.2730	.1994	.3936	.3575
363	Cycles, motor-cycles and parts	.0339	.2163	.2261	.2116	.3500
322	Machine-tools for working metal	.2027	.3128	.4215	.3611	.3331
316	Finished metal articles	.2470	.2723	.3066	.2964	.3329
222	Toys and games	.1693	.2460	.1901	.2780	.3328
373	Optical instruments	.1418	.1648	.1818	.2821	.3303
451	Mass-produced footwear	.4040	.3738	.4031	.3949	.3271
313	Transformation and coating of metals	.2869	.3371	.4549	.4162	.3204

Note: Intra-industry trade has been measured by the Grubel-Lloyd index:

$$IIT_{jk} = 1 - \frac{\sum_i \left| X_i - M_i \right|}{\sum_i (X_i + M_i)}$$

where *k* denotes trade between Italy and a partner or a group of partners, *i* denotes the 8-digit level product categories in manufacturing industries (11080 products), *j* stays for industry. This was computed on trade flows at 8-digit industrial products, aggregating each product by means of a weighted mean. The weights used are the relative size of exports and imports of each product on gross industry trade. In this way, to a large extent, the aggregation problem which afflicts the calculation of IIT was avoided. Data were concorded to the 3-digit NACE industry classification as according to the EUROSTAT COMEXT software concordance table.
Source: Own elaboration on COMEXT data.

Tab. A.4 – Italian intra-industry trade indices with Czechoslovakia/Czech R. (top thirty 3-digit Nace industries, 1997, as % of total trade)

Nace	*Description*	*IIT 1988*	*IIT 1992*	*IIT 1995*	*IIT 1996*	*IIT 1997*
351	Motor vehicles, parts and accessories	.0280	.1360	.2839	.4538	.4791
244	Articles of asbestos	.0000	.2215	.4437	.2194	.4540
326	Transmission equipment for motive power	.3125	.2020	.3308	.5680	.4467

363	Cycles, motor-cycles and parts and accessories	.0304	.0871	.3251	.2145	.4326
442	Leather and leather substitutes	.0048	.2981	.5430	.4866	.4237
243	Concrete, cement or plaster products for constructions	.0000	.0648	.2272	.2349	.4104
323	Textile machinery and accessories; sewing machines	.0812	.1307	.3144	.2447	.3681
374	Clocks and watches and parts	.0000	.0094	.0671	.2811	.3524
453	Ready-made clothing and accessories	.1371	.2228	.3004	.3119	.3206
436	Knitting industry	.0038	.3598	.2778	.2784	.2925
325	Plant for mines, the iron and steel industry, foundries and civil engineering	.0640	.0937	.2073	.2140	.2882
344	Telecommunication equipment	.0519	.0515	.0952	.1332	.2569
314	Structural metal products (includng integrated assembly and installation)	.7922	.3447	.2688	.2148	.2408
451	Mass-produced footwear	.0394	.3505	.3551	.2532	.2397
313	Secondary transformation, treatment and coating of metals	.0468	.0742	.1731	.2411	.2164
322	Machine-tools for working metal and of other tools and equipment for use with machines	.0909	.1421	.2440	.2178	.2096
465	Other wood manufactures (except furniture)	.5341	.0960	.1596	.2025	.2079
342	Electrical machinery	.0154	.0528	.1122	.1589	.2016
441	Tanning and dressing of leather	.3958	.1584	.1480	.1800	.1819
312	Forging	.0183	.1143	.1606	.1934	.1673
222	Steel tubes	.0007	.0625	.0293	.1362	.1600
324	Machinery for the food, chemical and related industries	.0591	.0905	.1206	.0944	.1579
372	Medical and surgical equipment and orthopaedic appliances	.0000	.0503	.1302	.1270	.1495
467	Wooden furniture	.1769	.4394	.0844	.1061	.1374
439	Miscellaneous textile industries	.0140	.2567	.2952	.1307	.1364
481	Rubber products	.0114	.1971	.1957	.2101	.1312
327	Other machinery and equipment for use in specific branches	.1016	.1137	.1790	.1309	.1271
373	Spectacles and equipment for use by opticians	.1168	.0830	.0807	.0789	.1260
341	Insulated wires and cables	.0484	.2918	.0446	.2560	.1252
316	Finished metal articles	.0765	.2374	.0953	.0992	.1249

Source: see Table A.2.

Tab. A. 5 – Italian intra-industry trade indices with Hungary (top thirty 3-digit Nace industries, 1997, as % of total trade)

Nace	*Description*	*IIT 1988*	*IIT 1992*	*IIT 1995*	*IIT 1996*	*IIT 1997*
482	Retreading and reparing of rubber tyres	.0000	.2286	.1125	.2305	.7216
456	Furs and fur goods	.0916	.7706	.4056	.1620	.5398
436	Knitting industry	.0462	.4187	.5381	.5639	.5223
341	Insulated wires and cables	.0000	.0074	.1455	.3112	.4997
494	Toys, games and sports goods	.3144	.4078	.1640	.7668	.4527
453	Ready-made clothing and accessories	.0412	.3707	.4165	.4162	.4451
372	Medical and surgical equipment and orthopaedic appliances	.0081	.3200	.0971	.1286	.4179
351	Motor vehicles and parts and accessories	.0117	.0972	.2210	.4813	.3793

352	Parts and accessories	.0000	.0194	.0081	.0623	.3752
442	Products from leather and leather substitutes	.0154	.3920	.2201	.2850	.3294
326	Transmission equipment for motive power	.1441	.4338	.3780	.2993	.2819
244	Articles of asbestos	.0000	.0000	.0000	.0851	.2774
342	Electrical machinery	.0893	.2686	.2530	.1684	.2659
466	Articles of cork	.1125	.3515	.1434	.2530	.2655
347	Electric lamps and electric lighting equipment	.0540	.1046	.0670	.1433	.2648
451	Mass-produced footwear	.1233	.4035	.3371	.2965	.2564
361	Shipbuilding	.0000	.0195	.0000	.0000	.2308
373	Spectacles, including lenses, frames and mountings and of eq for use by opticiens. Photographic equipment	.0254	.0859	.0855	.0956	.2254
463	Carpentry and joinery components and parquet flooring	.0000	.1035	.2311	.1896	.2227
247	Glass and glassware	.0439	.0548	.1657	.2072	.2193
322	Machine-tools for working metal and of other tools and equip use ent for use with machines	.0973	.2087	.2955	.2063	.2161
483	Processing of plastics	.1983	.2736	.2121	.1509	.2145
455	Household textiles and other made-up textile goods	.0084	.0804	.1432	.2375	.2123
325	Plant for mines, the iron and steel industry, foundries and civi engineering	.0397	.1943	.1442	.1260	.1840
222	Steel tubes	.0275	.1244	.2029	.1547	.1838
260	Man-made fibres	.0495	.1707	.2481	.2055	.1805
316	Finished metal articles	.0737	.1605	.1264	.1736	.1784
314	Structural metal products (including assembly and installation	.0000	.1160	.0917	.2453	.1696
344	Telecommunication equipment	.0158	.2181	.0932	.1301	.1677
323	Textile machineries and accessories; sewing machines	.0596	.0854	.2365	.2301	.1674

Source: see Table A.2.

Tab. A. 6 – Italian intra-industry trade indices with Bulgaria (top thirty 3-digit Nace industries, 1997, as % of total trade)

Nace	*Description*	*IIT 1988*	*IIT 1992*	*IIT 1995*	*IIT 1996*	*IIT 1997*
492	Musical instruments	.0084	.4565	.1743	.1870	.4863
248	Ceramic goods	.0000	.4165	.4805	.4751	.4733
436	Knitting industry	.0000	.2018	.2952	.4280	.4629
494	Toys, games and sports goods	.0018	.0242	.3195	.0493	.4310
330	Office machinery and data processing machinery	.0000	.2337	.1724	.2727	.4094
456	Furs and fur goods	.0144	.3347	.2521	.3837	.3741
442	Porducts from leather and leather substitutes	.0000	.1105	.0773	.0110	.3584
312	Forging	.2275	.2110	.3356	.1360	.2954
495	Miscellaneous manufacturing industries	.0488	.1128	.0507	.1045	.2943
328	Other machineries and equipment	.0650	.1246	.2752	.3053	.2905
453	Ready-made clothing and accessories	.0000	.3853	.4393	.2664	.2635

451	Mass-produced footwear	.0000	.0000	.0865	.0865	.2415
463	Carpentry and joinery components	.0111	.2095	.2333	.3905	.1734
326	Transmission equipment for motive power	.1093	.1410	.0709	.1074	.1704
316	Finished metal articles	.0000	.0533	.0737	.1989	.1643
247	Glass and glassware	.0126	.0858	.1515	.2382	.1530
325	Plant for mines, the iron and steel industry, foundries and civil engineering	.0000	.0000	.1047	.2783	.1380
246	Grindstones and other abrasive products	.0000	.0161	.1149	.2814	.1218
257	Pharmaceutical products	.0234	.1322	.1191	.1112	.1184
342	Electrical machinery	.0865	.1081	.0550	.1519	.1138
327	Other machinery and equipment for use in specific branches	.0627	.0957	.0433	.1303	.1133
256	Chemical products	.0407	.0121	.0669	.0299	.1128
465	Other wood manufactures	.0625	.0161	.1183	.1490	.0978
344	Telecommunication equipment	.0039	.2999	.0732	.1126	.0947
483	Processing of plastics	.1907	.4063	.0260	.0431	.0915
222	Steel tubes	.0000	.0365	.0363	.0380	.0827
491	Articles of jewellery	.0090	.0000	.0000	.0000	.0800
322	Machine-tools for working metaland of other tools and machines for use with metals	.0495	.1473	.2263	.0876	.0728
482	Retreading and repairing of rubber tyres	.1786	.1290	.0000	.1311	.0708
140	Petroleum refining and petroleum derivates	.0000	.0190	.0828	.5438	.0704
455	Household textiles and other made-up textile goods	.0014	.0077	.0548	.0442	.0661

Source: See Table A.2.

Tab. A. 7– Italian intra-industry trade indices with Poland (top thirty 3-digit Nace industries, 1997, as % of total trade)

Nace	*Description*	*IIT 1988*	*IIT 1992*	*IIT 1995*	*IIT 1996*	*IIT 1997*
326	Transmission equipment for motive power	.2644	.4826	.5934	.3468	.4062
314	Structural metal products	.0000	.4391	.2225	.1219	.3170
343	Electrical apparatus and appliances	.1659	.2911	.4148	.2255	.3108
463	Carpentry and joinery components	.0000	.0736	.2036	.3018	.2735
453	Ready-made clothing and accessories	.0259	.1879	.2429	.2345	.2594
495	Miscellanoeus manufacturing industries	.0000	.0034	.3718	.3942	.2576
247	Glass and glassware	.0274	.0728	.1532	.2117	.2323
436	Knitting industry	.0126	.2085	.1640	.2278	.2298
244	Articles of asbestos	.0349	.1629	.2063	.4343	.2276
365	Transport equipment	.0000	.3077	.0000	.1769	.2230
456	Furs and fur goods	.0151	.2245	.0184	.4697	.2149
481	Rubber products	.0044	.1974	.3472	.3077	.2066
462	Semi-finished wood products	.0000	.0255	.2352	.2417	.1972
471	Pulp	.0000	.0407	.0910	.1317	.1923

260	Man-made fibres	.0004	.1119	.3399	.1447	.1920
316	Finished metal articles	.1057	.1310	.1425	.1433	.1832
259	Photographic chemical materials and other chemicals	.0000	.2094	.0660	.1488	.1734
467	Wooden furniture	.1741	.3278	.1608	.1027	.1438
328	Other machinery and equipment	.0417	.0783	.1919	.0987	.1373
465	Other wood manufactures	.0025	.1346	.1005	.1478	.1371
371	Measuring, checking and precision instruments	.4025	.1080	.0740	.0645	.1110
222	Steel tubes	.0015	.1231	.0356	.1613	.1075
441	Tanning and dressing of leather	.0000	.1556	.1609	.2123	.1051
345	Radio and television receiving sets	.0245	.3095	.4084	.2109	.1050
372	Medical surgical equipment	.3664	.4050	.0647	.0919	.1032
312	Forging	.0000	.0589	.1131	.0820	.0986
493	Photographic and cinematographic laboratories	.4000	.0000	.0909	.0446	.0985
322	Machine-tools for working metals	.2146	.1750	.2834	.1076	.0972
451	Mass-produced foootwear	.0344	.1108	.1066	.1741	.0929
455	Household textiles and other made-up textile goods	.0000	.0271	.0558	.1001	.0916

Source: see Table A.2.

Tab. A. 8 – Italian intra-industry trade indices with Romania (top thirty 3-digit Nace industries, 1997, as % of total trade)

Nace	*Description*	*IIT 1988*	*IIT 1992*	*IIT 1995*	*IIT 1996*	*IIT 1997*
372	Medical and surgical equipment and orthopaedic appliances	.7292	.0069	.5017	.3549	.4903
467	Wooden furniture	.0234	.1388	.4992	.5562	.4694
494	Toys, games and sports goods	.0000	.1473	.3260	.5188	.4546
232	Mining of potassium salt and natural phosphate	.0000	.0000	.0000	.0000	.4167
436	Knitting industry	.0417	.2959	.3688	.4007	.3897
442	Products from leather and leather substiitutes	.0000	.2731	.3263	.3665	.3842
492	Musical instruments	.0078	.0000	.0000	.2319	.3636
322	Machine-tools for working metal and other tools and equipment	.0167	.1469	.3774	.2165	.3542
321	Agricultural machinery and tractors	.0000	.0241	.0885	.2357	.3459
463	Carpentry and joinery components	.0000	.0354	.3007	.2477	.2827
316	Finished metal articles	.0342	.1488	.2172	.2097	.2602
222	Steel tubes	.0000	.0355	.0962	.2499	.2540
352	Motor vehicles and motor vehicles parts and accessories	.0000	.0112	.3312	.0938	.2379
455	Household textiles and other made-up textile goods	.0011	.0697	.2468	.2740	.2292
325	Plant for mines, the iron and steel industry foundries	.0900	.0379	.2548	.2654	.2137
456	Furs and fur goods	.0295	.1606	.0682	.4177	.2121
312	Forging	.0000	.0412	.1505	.0574	.2098

343	Electrical apparatus and appliances	.3697	.0385	.1102	.1070	.2090
453	Ready-made clothing and accessories	.0019	.1175	.1861	.2035	.2012
247	Glass and glassware	.0075	.0263	.1081	.1473	.1979
327	Other machinery and equipment for use in specific branches of industry	.0323	.0365	.0932	.1063	.1805
231	Building materials and refractory clays	.0000	.0400	.1091	.0276	.1758
223	Cold drawing of steel	.0469	.1321	.1236	.1661	.1738
491	Jewellery and glodsmiths	.2121	.0798	.0356	.1503	.1721
483	Plastics	.0889	.0548	.1274	.1703	.1655
371	Measuring, checking and precision instruments	.0000	.0739	.0358	.1075	.1572
328	Other machinery and equipment	.1079	.0536	.1204	.1084	.1506
245	Stone and non-metalic mineral products	.0000	.0421	.0497	.1233	.1469
313	Secondary transformation, treatment and coating of metals	.0174	.0716	.1427	.1426	.1389
465	Other wood manufactures	.1369	.1635	.0773	.0844	.1362

Source: See Table A..2.

Tab. A. 9 - Marginal intra-industry trade between Italy and CEEC-8 by sectors (Nace-Clio-R. 25; 1988-1995)

NACE sectors	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Tot
CEEC-8																	
1988-1989	.0275	.0259	.0537	.0887	.0966	.0800	.0454	.0516	.0823	.1207	.0779	.1311	.1364	.1178	.1674	.0907	.0783
1989-1990	.0203	.0090	.0001	.1118	.0817	.0744	.0645	.0448	.1075	.1088	.0270	.1096	.1829	.0946	.1160	.1562	.0755
1990-1991	.0436	.0200	.0112	.0850	.1279	.0642	.0607	.0834	.1269	.3084	.0471	.1128	.1964	.0633	.1641	.1759	.0889
1991-1992	.0272	.0042	.3468	.1048	.1114	.0424	.1040	.1727	.1645	.1173	.0166	.2042	.1000	.1069	.1198	.0552	.0851
1992-1993	.0256	.0024	.0034	.1055	.0896	.0834	.0872	.0919	.0890	.2482	.0304	.1660	.0836	.0728	.1176	.1770	.0924
1993-1994	.0363	.0131	.0752	.1278	.0959	.0812	.0758	.1909	.1332	.2015	.0235	.2317	.0902	.0937	.1207	.1598	.1090
1994-1995	.0486	.0044	.1952	.1320	.1401	.1017	.1184	.1097	.1065	.3848	.0335	.2040	.0615	.0690	.1427	.1395	.1300
1988-1995	.0262	.0100	.0139	.1001	.0917	.1170	.1115	.0986	.1370	.0682	.0298	.3052	.0895	.0726	.1497	.0814	.1317
1996-1997	.0360	.0285	.1079	.1104	.0802	.1172	.1230	.1489	.1677	.0643	.0425	.2285	.1500	.0436	.1638	.0920	.1222

Source: own elaboration on COMEXT data.

Tab. A.10 - Horizontal and vertical intra-industry[1] trade between Italy and CEECs (1988-1995)

COUNTRIES	IIT[2]	1988	1989	1990	1991	1992	1993	1994	1995
Czechoslo	HIIT	.0017	.0103	.0158	.0284	.0371	.0214	.0377	.0370
vakia -	VIIT	.1259	.2013	.2215	.1810	.1766	.1908	.1760	.1899
Czech R.	VIIT(-)	.0335	.0350	.0207	.0280	.0302	.0482	.0393	.0357
	VIIT(+)	.0923	.1664	.2008	.1529	.1464	.1426	.1367	.1542
Hungary	HIIT	.0009	.0246	.0127	.0400	.0587	.0407	.0357	.0544

	VIIT	.0850	.1948	.1995	.1802	.2218	.1897	.2337	.1972
	VIIT(-)	.0195	.0403	.0327	.0604	.0791	.0704	.1059	.0937
	VIIT(+)	.0655	.1545	.1668	.1197	.1427	.1193	.1278	.1035
Poland	HIIT	.0017	.0231	.0048	.0272	.0114	.1135	.0786	.0803
	VIIT	.0976	.1257	.1621	.2459	.1899	.1090	.1305	.1423
	VIIT(-)	.0096	.0071	.0136	.0595	.0213	.0201	.0244	.0265
	VIIT(+)	.0879	.1186	.1486	.1863	.1685	.0889	.1060	.1158
Bulgaria	HIIT	.0012	.0390	.0189	.0083	.0250	.0330	.0332	.0250
	VIIT	.2865	.1271	.2108	.2010	.3266	.3289	.2790	.2812
	VIIT(-)	.1183	.0300	.0209	.0786	.1796	.1804	.1316	.1443
	VIIT(+)	.1682	.0968	.1899	.1224	.1470	.1485	.1474	.1369
Romania	HIIT	.0010	.0228	.0030	.0235	.0285	.0232	.0237	.0356
	VIIT	.0649	.1336	.0985	.1582	.1421	.1603	.1272	.1351
	VIIT(-)	.0072	.0213	.0613	.0716	.0588	.0610	.0454	.0533
	VIIT(+)	.0577	.1123	.0372	.0866	.0834	.0993	.0819	.0818

Notes: [1] The definition of HIIT, VIIT, VIIT(-) and VIIT(+) is provided in section 3. For a better understanding of the table, recall that IIT = HIIT + VIIT and that VIIT = VIIT(-) and VIIT(+) Here α =0.15.
Source: own calculations on COMEXT data.

Tab. A.11 - The Neven taxonomy

Factor intesnsity/Sectors	Share of white collars	Average wage	Wage bill/ value added	Investment/ value added
1. Very high human capital and high tech (chemicals, office machinery, electronic goods, aerospace) SB in Pavitt's taxonomy[1]	Very high	Very high	High	High
2. high human, low physical capital (mechanical, electrical and instrument engineering) SS in Pavitt's taxonomy	High	High	High	Low
3 low human, low physical (footwear, clothing, wood, building) T in Pavitt's taxonomy	Low	Low	Very high	Low
4 low human, high physical (motor vehicles, glass, textile) SI in Pavitt's taxonomy	Low	Low	Intermediate	High
5 high human, high physical (non metallic minerals, food processing)	High	High	Low	very high

[1]The Pavitt taxonomy distinguishes four macro-sectors: 1) science based sectors (SB) in which the competitiveness depends on the ability to produce innovation; 2) scale intensive sectors (SI) in which a role is played by static and dynamic gains and which therefore rely on market dimension; 3) specialised sectors (SS) which employ the technology produced elsewhere and have to compete both on price and technology; 4) traditional sectors (T) whose competitiveness is essentially based on price.
Source: Adapted from Neven (1994), pp. 22-23.

Tab. A.12 - OLS[1] estimates of the skilled/unskilled ratio in Italy-CEECs trade

Dependent variable: SKILLED TO UNSKILLED LABOUR RATIO

(non-manual to manual workers)

Variable / (Proxy)	Expected signs	(1)	(2)	(3)
1 – MARKET STRUCTURE / COMPETITIVENESS	—	-0.00***	-0.00***	-0.00***
(Number of firms)		(4.21)	(-2.71)	(-2.68)
2 – PRODUCT DIFFERENTIATION	—	-0.00	-0.00	-0.00
(Number of products)		(0.94)	(-1.36)	(-1.40)
3 – INNOVATION	±	-0.19***	-0.24***	-0.24***
(Investments / added value)		(-2.70)	(-3.07)	(-3.07)
4 – RESEARCH AND DEVELOPMENT	+	0.06***	0.05***	0.05***
(Expenditure in R&D per firm)		(7.26)	(2.59)	(2.64)
5 – CAPITAL INTENSITY	+	18.87***	21.69***	21.68***
(Capital to labour ratio)		(4.42)	(2.47)	(2.44)
6 – REVENUES	+	0.00***	0.00***	0.00***
(Revenues)		(7.17)	(2.69)	(2.64)
7 – ECONOMIES TO SCALE	+	-0.01***	-0.01***	-0.01***
(Turnover per firm)		(-6.98)	(-2.45)	(-2.46)
8 – QUALITY DIFFERENTIATION	+	0.03***		
(Unit value ratio in Italy-CEE trade)		(3.39)		
9 – HIIT	non significant		0.15	
(Share of HIIT with $\alpha = 0.15$)			(1.01)	
10 – HIIT	non significant			0.17*
(Share of HIIT with $\alpha = 0.25$)				(1.71)
11 – VIIT(-)	—		0.15	
(Share of VIIT(-) with $\alpha = 0.15$)			(0.82)	
12 – VIIT(-)	—			0.05
(Share of VIIT(-) with $\alpha = 0.25$)				(0.25)
13 – VIIT(+)	+		0.22**	
(Share of VIIT(+) with $\alpha = 0.15$)			(1.97)	
14 – VIIT(+)	+			0.23*
(Share of VIIT(+) with $\alpha = 0.25$)				(1.81)
15 – INTER-INDUSTRY TRADE	+		0.21**	0.20**
(Share of IT)			(2.24)	(2.11)
R-squared		0.54	0.53	0.53
Adjusted R-squared		0.51	0.48	0.48
Durbin-Watson statistic		1.68	1.66	1.67
F-statistic		14.98	9.67	9.72
Incl. Obs		96	96	96
Excl. Obs.		7	7	7

Notes:

[1] White's heteroskedasticity consistent variance and covariance.
[2] T-values are between brackets.
[3] Dependent variable is the non manual to manual workers ratio.
[4] The variables' definition is provided in the main text, in section 3 for trade variables and in section 5 for industry variables.
[5] The expected sign of the inter-industry trade variable is positive when the cases of "No imports" are more numerous than those of "No exports".
[6] All the variables are at a 3-digit level of the Nace-Clio classification. Trade variables have been obtained from 8-digit CN data.
Sources: INDE database and own elaboration on COMEXT data.

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