The Eastward Enlargement of the Eurozone
Trade and FDI

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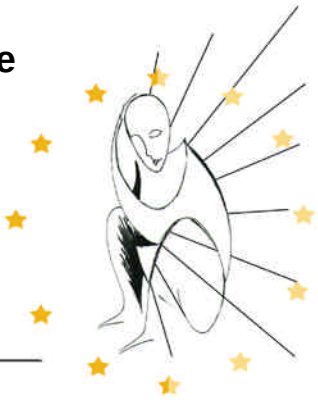

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THE EASTWARD ENLARGEMENT OF THE EUROZONE

Trade and FDI

By J. Caetano, A. Galego, E. Vaz, C. Vieira, I. Vieira

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Executive Summary:

The objective of this study is to examine recent developments in trade and FDI flows between the EU and the CEEC, trying to anticipate future consequences from the economic integration of the two blocks. Economic theory suggests that integration conveys positive effects upon welfare, due to the reallocation of resources and the restructuring of production and trade. The Eastern enlargement represents both an opportunity and a risk for the EU members as well as for the CEEC. As a result of the differences in size between the two groups of countries involved, it is likely that on average the CEEC will face the highest risks but may also experience the largest benefits. It is expected that both trade and FDI flows will increase with deeper economic integration. However, the free circulation of goods, services and capital over a wider geographic area creates opportunities for the exploitation of scale economies, which may lead to the geographical concentration of production. Therefore, in spite of the expected positive global effects, it is acknowledged that, during the transition period, difficulties may arise in those sectors, regions and firms confronted with new competitive challenges.

In the CEEC, transition from centrally planned to market economies coexists with the plans for future integration in the EU. Both processes prompt internal and external liberalisation processes, with social and economic consequences that are difficult to predict. In order to develop a coherent study in such a complex context, an attempt is made to integrate different analytical perspectives.

The exhaustive assessment of the changes in the pattern of trade between candidates and current EU members comprehends an analysis of the global intensity of trade flows and of potential trade creation and diversion effects. The study also examines tendencies for sectoral specialisation and the evolution of the position of countries in the process of international segmentation of production. In respect to FDI, an empirical assessment of its main determinants is followed by the evaluation of potential diversion of investment flows from the EU periphery to the CEEC.

The most relevant conclusions of the study are the following:

1. In spite of reinforced trade relations between CEEC-EU, the empirical analysis suggests the existence of space for further improvement, as income levels converge and economic reforms consolidate in the candidate countries. Income and distance positively affect the volume of trade, indicating that countries that are close in economic and geographical terms are more capable of expanding bilateral trade. They may also suffer greater pressure from competitiveness due to reciprocal openness.

2. The sectoral pattern of comparative advantages has undergone profound changes, reflecting a gradual shift of CEEC' exporting structures to sectors more intensive in technology, where wages are relatively high, and which are less anchored in natural resources and labour intensive products. There is, however, strong heterogeneity at the country level, suggesting that geographic proximity to the EU and income convergence stimulate product differentiation and the trade of R&D and capital intensive goods.

3. The expansion of trade of intermediate products and the emergence of a profile of vertical specialisation confirm the progressive and quick entrance of the CEEC into the international division of productive processes. This reflects the market re-valuation of factor endowments, extensive not only to traditional industries but also to those producing machinery, automobile and telecommunication products.

4. The nature of CEEC-EU trade still reflects the strong factor complementarity between the two groups. The results obtained demonstrate that trade of vertically differentiated products has been assuming a significant share in the exchanges between the EU and the more central candidate countries. However, the CEEC and the EU continue to export goods of different ranges, implying that those countries present comparative advantages in trade of low quality products. This distinct positioning in the price/quality range suggests a general qualitative division of labour between the two groups of countries.

5. The empirical assessment of the determinants of FDI, which is based on the estimation of a gravity type model, suggests that international investments are mainly determined by host country characteristics such as dimension, potential demand, openness to world trade and lower relative labour compensation levels. In terms of the investing country, the only significant feature is population, which appears to be positively related to the supply of FDI funds.

6. With the objective of examining whether the observed volume of FDI flows were above or below the potential values suggested by the model, in-sample predictions of FDI flows were performed for several CEEC and Southern EU countries. The results suggest that, contrary

to what could be expected, there is no evidence of FDI diversion from the Southern European countries to the CEEC.

FDI is a quick way of transferring technology and efficient management practices, thus benefiting the entering of domestic firms into global markets. International corporations create global production networks based upon intra-firm trade, hence stimulating the emergence of complex intra-industrial specialisation patterns, which are extended to the exchange of products in all stages of production. Throughout the report, there are indications that FDI flows have an important role in the process of transformation of trade structures in the CEEC. Firstly, the high volume of FDI appears to have contributed to the transformation of these countries' specialisation patterns, leading to the gradual consolidation of export structures based upon products that are intensive in technology and in qualified labour. Secondly, in almost all CEEC, the structural changes in trade composition were consolidated by an increase of IIT in total trade. Such a situation is particularly noticeable in the countries receiving the highest amounts of FDI, thus suggesting a positive link between the two. Finally, FDI has stimulated the gradual insertion of the CEEC in the process of global division of labour, which is the basis for the process of international segmentation of production.

The preferential access to EU markets, coupled with the liberalisation of CEEC' domestic markets, has promoted changes of specialisation patterns in these countries. However, national options in terms of economic policy have constrained the rhythm and intensity of those changes. Those who adopted more radical liberalising reforms, and applied wider programs of privatisation and macroeconomic stabilisation have attracted higher amounts of FDI and have progressed more in economic terms.

The remaining question is whether past convergence trends of the CEEC towards the EU are sustainable in the context of membership. In spite of FDI-driven structural changes, there appears to exist space for further restructuring of domestic firms, especially in relatively protected sectors. On the other hand, in spite of the abolishment of trade barriers between the CEEC and the EU, enlargement may create additional competitiveness problems in the former due to the adoption of the Common External Tariff (which is lower than current tariffs) in relation to third countries. In addition, the functioning of the single European market is quite demanding in relation to the harmonisation of product characteristics and of the technical aspects of production, and this corresponds to the raising of non-tariff barriers.

Introduction:

Since the beginning of the negotiation process for the Eastern enlargement of the EU, trade and FDI have played an important role to approximate member states and applicants. An asymmetric tariff reduction has taken place from the onset, and currently tariff barriers have been practically dismantled. CEEC' transition phase to a market economy may now be considered completed, since the geographical reorientation of trade, away from the former Council for Mutual Economic Assistance (CMEA) countries towards the EU, seems to have reached its limits. Industrial recovery and rapidly rising levels of productivity in these countries have been inducing strong changes in the sectoral composition of output, which will in turn influence trade patterns. The flows of FDI to the CEEC, and the establishment of subcontracting agreements with EU firms, have become substantial and are crucial to the industrial restructuring process and to the structure of international trade.

Over the last decades, the increasing fragmentation of production processes and the development of worldwide production and marketing networks have enhanced economic, financial and technological globalisation. Progress in production technologies and in communications has contributed to the segmentation of production processes, leading to the development of subcontracting. As a result, a vast variety of entrepreneurial agreements has emerged, generating production and exchange networks between firms of different countries, thus contributing to a renewed system of international labour division.

The dynamics of trade flows and FDI, along with the strengthening of other forms of entrepreneurial cooperation, are the most visible channels of economic and technological integration of the two European areas. However, the assessments developed so far suggest that economic benefits have not been evenly distributed at the geographical and the sector levels. Hence, the enlargement entails, from the onset, different risks for the several agents involved.

1. EU-CEEC trade: characteristics and trends

The collapse of centrally planned economic regimes in the CEEC, and the subsequent process of economic liberalisation, brought about important transformations in terms of external trade. As may be seen in Table 1, the openness to world markets was rapid and

generalised, with the degree of openness[1] evolving from 56% in 1993 to around 70% in 1999, whereas in the same period the EU went from 41% to 50,6%. In countries such as Estonia, Slovakia and Hungary, the degree of trade openness exceeded 100% in 1999, a figure that clearly underlines the importance of external trade in candidate economies. The CEEC display high structural commercial imbalances, with trade deficits around 6,5% of GDP. In the Baltic countries and in Poland the deficit was above 10%, in 1999, a result of the deterioration occurred during the last decade.

[Table 1 about here]

In 1999, trade relations with the EU were the main responsible for this state of affairs, generating on average around 57% of the deficit. In some countries, namely Slovenia, Romania and the Czech Republic, the imbalance with the EU was much higher. By entering the EU, these countries may be creating the conditions to increase their trade deficits as a result of both lower risk premia for FDI, and public transfers from the EU (Boeri and Brucker, 2000). On the part of current members, a similar situation of trade dependency in relation to the EU occurred for Portugal, Greece and Spain. All these economies saw their trade deficits aggravated after joining the Community.

[Table 2 about here]

The progressive reorientation of CEEC' economies towards the EU coincided with a decline in their relationships with the members of the CMEA. In 1999, the weight of the CEEC' external trade with the EU was around 66,5% (55% in 1993),[2] already a similar situation to that of the majority of the EU members. In real terms, the intensity of CEEC' exports to the EU increased 25% between 1993 and 2000,[3] whereas the inverse flow grew around 18% (see, table 1 in appendix). Notwithstanding that, the weight of the candidate countries in the EU trade reached only 4,1% and 3,1% for exports and imports, respectively. The scenario was

[1] Defined as the weight of external trade on GDP.
[2] In countries such as Slovenia, Hungary, Poland and the Czech Republic, the weight of the EU in CEEC' trade is above 70%.
[3] The index of the relative intensity of exports has a three-dimensional nature, and therefore takes into account the evolution registered in the exports of the country of origin and the imports in the country of destiny, weighted by the flows of world trade during the period of analysis.

nonetheless distinct in different countries. Austria and Germany displayed values of 12% and 9%, respectively, whereas in peripheral countries such as Portugal, Spain and Ireland the weight of CEEC did not overcome 2% of total trade (see table 2 in the appendix).

Trade intensity is quite different across countries, being Hungary, the Czech Republic and Poland, amongst the candidate countries, and Germany, Austria and Finland, on the part of the EU, those which are clearly more involved in reciprocal trade, thus stressing the importance of geographical proximity for commercial exchanges. The intensity of bilateral trade is also heterogeneous, being the relationships more intense in the following cases: Austria and Germany with Hungary, the Czech Republic, Slovenia and Slovakia; Greece with Bulgaria and Romania; and Finland and Sweden with the Baltic countries (see table 3 in appendix). On the contrary, the level of trade is low between the CEEC and the Iberian countries and Ireland, in spite of an increase in recent years.

Reflecting the described asymmetries, countries that share a common border with the EU are responsible for 82% of the candidate countries' trade with the EU,[4] while the Balkan and Baltic countries present figures of around 10,5% and 7,5%, respectively (see table 4 in appendix). In what concerns EU member states, trade is also concentrated in frontier countries, with Germany, Austria and Italy being responsible for more than 60% of trade with the CEEC (45%, 8% and 12%, respectively). Portugal, Ireland and Greece, on the other hand, generated only 2,5% of such flows (see table 5 in appendix).

In this context, no substantial effects upon current EU members are anticipated following the enlargement, as the main trade barriers are by now dismantled and trade liberalisation is already a reality. In fact, productive activities in the EU are weakly exposed to trade with the CEEC, as to the EU as a whole the weight of exports to, and of imports from, the CEEC is no more than 1,2% and 0,9% of global GDP, respectively. However, it is expected that the impact in terms of production and employment in those regions and sectors still protected by trade barriers may be substantial. On the other hand, while only 4% of the EU exports are sent to the CEEC, about 70% of the CEEC´exports are directed to the EU members. Therefore, the trade effects on the CEEC' economic growth are expected to be much larger than in the EU.[5]

[4] The so-called CEEC5: Hungary, Slovenia, the Czech Republic, Slovakia and Poland.

[5] Breuss (2001) predicts that the trade effects for the CEEC on GDP will be on average ten times higher than to the EU, on average.

With the objective of appraising some of those impacts, the results of the research on the level of trade composition will be presented, based upon tendencies observed since the collapse of the CEEC' centrally planned economic regimes. The analysis is organised as follows: the first section assesses potential trade between the EU countries and the CEEC; in the second, an investigation of the effects of trade creation and trade diversion is performed; section three contains the analysis of production factors and patterns of inter-industrial specialisation; section four includes an appraisal of international segmentation of production processes; section five includes an analysis of the characteristics of intra-industrial specialisation, taking into account the quality and variety of exchanged goods; the last section concludes.

1.1 - Potential Trade between the EU countries and the CEEC

The process of enlargement originated a vast literature on the measurement of its effects, particularly upon trade relations. The Eastern Enlargement represents an opportunity for trade expansion for all the EU and, in fact, trade between the EU and the CEEC grew considerably in the nineties. However, both gains and losses from trade expansion are not evenly distributed in the EU. Some authors have anticipated that less developed regions/countries and problematic industrial sectors will benefit less with the enlargement.

Many studies report changes in terms of volume, composition and nature of trade between EU countries and the CEEC during the process of transition. In what concerns the impacts on trade, one key aspect is whether the trade potential between the EU and the CEEC has already been exhausted. Different theoretical and empirical approaches have analysed the levels of "potential trade". Gravity models have been widely adopted in modelling the integration process between the CEEC and the EU, namely in assessing the impact of the enlargement on trade potential. Several studies on the effects of enlargement on trade have presented contradictory results about the overall trade effects of gradual integration of CEEC into international markets. While some concluded that the EU-CEEC trade was well below its potential level,[6] other studies found that the actual EU-CEEC trade was either close to the potential level or even above potential.[7]

[6] For example, Hamilton and Winter (1992), Baldwin (1994), Buch and Piazolo (2000) and Jakab *et al.* (2001)
[7] For example, Gros and Gonciarz (1996), Festoc (1997) and Nielson (2000)

The distinct results are probably due to two main reasons. On the one hand, it must be noted that the integration process of the CEEC into international markets was very rapid and, as a consequence, there was a fast expansion of trade flows between the EU and the CEEC. On the other hand, there are some issues concerning data and econometric procedures employed in empirical analyses that raise doubts on the estimates of some of these studies.

In order to study bilateral trade relations between the EU countries and the CEEC, and to predict the trade adjustments associated with the lifting of trade barriers stipulated in the European Agreements, we estimate a gravity model, using a panel data approach for the period between 1993 and 1999. Due to the fact that the Hausman test rejected the hypothesis of no correlation between the explanatory variables and the individual and time effects, we estimate a fixed effects model in order to obtain consistent and non-biased estimators. We estimate several specifications, including different regressors, and considering country-specific individual effects and bilateral common effects. The latter specification is more general and it has been referred recently as the most appropriated. [8] In this type of model the individual fixed effects control for all historical, cultural, geographic and other time-invariant factors, which may be important for trade relations between two countries. The results are displayed in table 3.

[Table 3 around here]

The parameter estimates are in accordance with those usually obtained in the empirical literature on international trade. The results support the idea that the size of the economy has a statistically positive influence on bilateral trade relations. On the other hand, countries' similarity and economic distance seem to have a negative impact on bilateral trade flows.

In the analysis of the effects of the enlargement upon trade, it is important to consider the consequences of foreign exchange rate stability, as well as of the adoption of a common currency. Most previous studies conclude that exchange rate stability and currency unions benefit international trade. [9] In our model we introduced the bilateral exchange rate as well as a measure of exchange rate volatility as proxy to the effect of the currency union on trade. In fact, reducing exchange rate volatility to zero might not be equivalent to a common currency.

[8] See Egger and Pfaffermayer (2000), Fontagné *et al.* (1999) and Cheng and Wall (2001)
[9] See Rose (2000), Glick and Rose (2001), Artus and Ricoeur-Nicolai (1999), Benassy-Quere and Lahreche-Revil (1999), Giovanni dell'Ariccia (1999).

Rose (2000) argues that sharing a common currency is a much more serious and durable commitment than a fixed exchange rate. Our results suggest that exchange rate stability will have a positive effect on trade flows.

Our gravity model estimates of trade flows are also used to analyse whether the potential trade between the EU and the CEEC is above or below the actual level. As the more general model, considering common bilateral effects, gives better in sample predictions,[10] we use these estimates to predict the potential of trade between the EU and the CEEC countries in 1993 and 1999. The results on the potential versus actual exports percentage deviation may be seen in table 4.[11] These show the deepening of the process of trade liberalisation between the CEEC and the EU. It may be concluded that the short –term trade potential is exhausted for the majority of countries. There are, however, some differences between the imports and exports. The results suggest that exports to the CEEC have converged more quickly than imports from the CEEC, particularly in the case of Poland, Bulgaria, Latvia, Slovenia and Lithuania. There is still a gap between actual and potential imports from these Eastern countries.

However, even in the case of exports to the CEEC, there is room for further expansion of trade flows for some specific countries. This is the case for the exports of Austria, Denmark, Finland, Netherlands, United Kingdom and Greece, especially to Eastern countries like Slovenia, Slovakia, Bulgaria, Czech Republic, Hungary and Poland. In terms of imports, it may be inferred from the results that there is still scope for growth in imports from the CEEC, especially from Poland, Latvia, Slovenia, Lithuania and Bulgaria, to EU countries such as Greece, Finland, Denmark, Netherlands, United Kingdom, Germany, Sweden and Portugal. [12]

[Table 4 about here]

In the long run, given the permanent economic transformation of the CEEC, it is difficult to predict with confidence the future trade potential. Yet, in spite of the great expansion in the EU-CEEC trade relations, it is expected that the volume of trade will continue to increase

[10] See Fontagné *et al.* (1999), Egger and Pfaffermayer (2000), Chang and Wall (2001).
[11] We report the results obtained using the estimates from specification A, as for this one data are available for all countries in our sample. However, the conclusions using the estimates from other specifications are not very different.
[12] Bilateral results for Potential and Actual exports may be seen in tables 6 and 7 in Appendix.

due to the expansion of real incomes and to the progress in market reforms. [13] Most analyses also suggest that this tendency will not be equal in all countries. The accession of the CEEC to the EU will have in itself a positive effect on bilateral trade flows. On the other hand, it is important to stress that the enlargement of the Euro zone to these countries will have also, according to our results, positive effects on trade flows.

In the analysis of the results of gravity models, it should be acknowledged that these models do not consider the possible existence of substitution processes between countries in their exports. This is a very important aspect, as it means that the effects of the association agreements might not be felt for some countries, in the sense that some countries' exports might be substituted by CEEC' exports. The following section evaluates this aspect to complement the analysis based on the gravity model.

1.2 - The effects of trade creation and trade diversion in the EU-CEEC trade flows

Economic integration reduces trade barriers, reallocates economic factors and hence stimulates potential welfare gains for the countries involved. In a static perspective, Viner (1950) identifies the effects of trade creation and trade diversion, as appropriate measures to evaluate the impacts of economic integration. Although this approach does not consider the dynamic effects of increasing competition and the changes in the intensity and in the investment pattern, it may allow the identification of some expected trade effects of the EU enlargement.

Theoretically, trade creation increases with the similarity of a country's export patterns in relation to the import patterns of the other, reflecting the fact that the country's productive structures adapt themselves to the internal demand requirements of its partner. In this case, the abolition of trade barriers and the reduction of transaction costs should stimulate trade. On the other hand, trade diversion reflects a situation where the export patterns of the two countries for a given market are significantly overlapping. With free market access for all countries involved, competition among them may be strong,

Several indicators are used to analyse trade structures for certain periods and to predict future developments. The results are highly dependent on data disaggregation levels. Analyses with

[13] See Fontagné *et al.* (1999), and Auxilioux and Pajot (2001).

highly aggregated data tend to overestimate the degree of similarity. To overcome this possible problem, our analysis is developed using highly disaggregated data. The data set involves around 3400 products,[14] and the indicators are calculated in bilateral terms for all the EU members and for the candidate countries, for the years 1993 and 2000. Results are displayed in table 5 (see also tables 8 and 9 in appendix).

In terms of similarity between the EU members' exports and the CEEC' imports, it may be concluded that the countries that will potentially benefit more from the enlargement are Germany, Italy, France, Austria and the United Kingdom, while those with fewer benefits are Greece, Portugal, Finland and Denmark. This situation occurs in both 1993 and 2000, in spite of the increase in the degree of similarity. Due to the stability of the results, it is expected that the present situation will not change much in the short-term. The regional patterns of the trade diversion indicator are to some extent convergent with the trade creation indicator. Therefore, the countries which will be potentially more affected by the competition of the CEEC in the EU markets are Germany, Austria, France, Italy and Portugal, while in the opposite situation are Ireland and the Nordic countries (with the exception of Sweden).

[Table 5 about here]

In global terms, taking into account the two indicators and their deviation from the average values for the EU and for the candidate countries, there are some similarities on the results obtained for the two years. This suggests that the countries potentially more affected by CEEC competition are also those which will benefit the most from the total opening of the domestic markets to those countries (Germany, Austria, France, Italy, Spain, Sweden and the United Kingdom). On the other hand, the countries benefiting less will be also the least affected by the increasing competition of the CEEC in EU markets. This suggests that the impacts may be very small for countries like Ireland, Greece, Finland, the Netherlands or Denmark.

The exceptions to this pattern are Belgium-Luxembourg and Portugal, although in completely different terms. In fact, the first are in a favourable position, since they will be weakly affected by trade deviations and they can take advantage of the enlargement to expand exports. On

[14] As a consequence, our results are significantly lower, in absolute value, than the ones obtained in other studies. See, for instance, Dohrn *et al.* (2001).

the contrary, Portugal will be the more negatively influenced country. Due to its geographical location and to its exports profile, Portugal does not meet the necessary conditions to gain substantial market shares in the CEEC. In contrast, it may be affected by the competition of these countries in the access to EU markets, as a consequence of significant trade diversion in some sectors.[15] These results are in accordance with those of previous studies, which concluded that Portugal would be the country with less benefits from the process of enlargement.[16]

In relation to the CEEC, there is also high convergence in the results obtained for the two years. The main beneficiaries from potential trade diversion and trade creation will be the countries geographically and economically closer to the EU (CEEC-5). These countries present a pattern of exports similar to the one observed among EU countries, and they may gain market shares from the current members of the EU. However, these countries are also the best markets for EU exports and they are more exposed to the competition of European firms. The Baltic and Balkan countries will possibly be less affected by competition in their domestic markets, but the dimension and structure of their exports will limit in a significant way their competitiveness in the EU.

In synthesis, geographical and economic factors have to be taken into account when anticipating the trade impacts of the enlargement. The central countries of the enlarged EU are in better position to take advantage of reciprocal openness, not only due to geographical proximity, which reduces transport costs, but also essentially due to higher adjustment of their productive specialization to the dynamics of demand in the neighbouring markets. Consequently, enlargement will trigger trade intensity, reviving old economic partnerships among neighbouring countries which, depending on their technological capabilities and factor endowments, will affect the levels of welfare of the involved countries. The following section contains an analysis of the changes occurred on trade composition in terms of factor intensity, resulting from changes in factor endowments and costs.

[15] In the case of Portugal, the evolution of the exports' pattern is disturbing. On the one hand, the degree of similarity with the CEEC imports is inferior to most EU countries. On the other hand, there was a significant decrease on the indicator in relation to the imports from the most important EU markets (France, United Kingdom, Germany, Spain and Italy). Due to this evolution, in 2000 the degree of similarity between the exports to the EU of the Czech Republic and Hungary was already clearly superior to the one observed for Portugal.

[16] See, for instance, Emerson and Gros (1998) and Breuss (2001).

1.3 - Production Factors and Patterns of Inter-Industrial Specialisation

The neo-classical theory of international trade is the starting point in the analysis of nations' productive specialisation. Based on the Hecksher-Ohlin-Samuelson (HOS) model, this theory attempts to explain trade patterns through factor endowments. These determine productive specialisation and the pattern of comparative advantages of the different countries, since productive specialisation occurs in those goods that use intensively the more abundant factors. In this sense, the integration of economies characterised by strong differences in factor endowments increases welfare in aggregate terms, although the gains and losses may be unevenly distributed through the distinct production factors. However, there are some aspects that are underestimated by the original theory, but are important to the understanding of the real world, namely the assumption of homogeneous production functions in the different countries, the price convergence of goods and factors in a free trade situation, the perfect mobility of factors (both sectoral and geographical), and the complete specialisation of countries.

Due to the idiosyncratic trade relations between the EU and the CEEC, some additional factors must be taken into account. First, following the liberalisation process, productive structures in these countries went through profound changes in the last decade, which radically transformed the political, social and economic environments. Second, these reforms have changed the economic structures and, consequently, the trade flows and the respective specialisation patterns, reflecting the changes in the relative prices of goods and factors. Finally, the new economic and political contexts encouraged investment in both physical and human capital, being the process led by multinational companies.

It is questionable whether wage differences between the EU and the CEEC are, by themselves, an advantage in the production of labour intensive goods. In fact, since the beginning of the transition process it was contentious that the relatively high level of labour qualification in the CEEC could be advantageous in the production of qualified labour and human capital-intensive goods (Hamilton and Winters, 1992). Some authors question the capacity of education levels to originate comparative advantage in the production of human-capital intensive goods, due to the insufficient endowment of complement factors, especially in terms of technological modernisation (see Collins and Rodrik, 1991). Nevertheless, investment in these factors could bring high returns and promote the transition of the CEEC' comparative advantage from cheap non-qualified labour to cheap qualified labour, particularly

due to the stimulus of FDI in the production of human capital intensive goods employing technological innovation (Landesmann, 1997).

Usually the analysis of the comparative advantage pattern assumes an homogeneity of goods produced using the same proportions of factors. Here, however, we adopt a classification of industries by the factors considered decisive for the competitiveness of each sector.[17] The following groups of industries are used: resource intensive; labour intensive; scale and capital intensive; specialised suppliers; R&D intensive.

In 1993, CEEC exports to the EU were based fundamentally on labour intensive goods, and imports on scale/capital and R&D intensive goods (see table 10 in appendix). Yet, the pattern has been changing, with the emergence of exports from scale and capital intensive sectors, as well as sectors which establish their competitiveness on the ability to differentiate goods. Nevertheless, the evolution of trade was not similar in every CEEC, with the most significant progress occurring in the CEEC-5, where the share of exports from scale and capital-intensive industries was above other countries. These countries, reduced significantly the share of exports from labour intensive sectors, and strongly increased those of the capital intensive and specialised suppliers sectors. In the imports originating from the EU there was a similar trend, suggesting a growing demand for more sophisticated industrial goods, from sectors technologically more advanced and employing more qualified labour.

[Figure 1 about here]

The Revealed Comparative Advantages (RCA) index of the CEEC in 2000 were also observed in sectors intensive in natural resources and labour and on non-industrial products, while the EU's RCA index were found on products intensive on R&D, capital and differentiated goods.[18] However, the CEEC became progressively more competitive on sectors less dependent on natural resources and less qualified labour, presenting, at the same time, lower disadvantages in the trade of differentiated goods. Differentiation among countries became more marked during the period, allowing the identification of several tendencies in the specialisation pattern (see table 11 in appendix). The CEEC-5 base their

[17] Specifically we build an indicator of Revealed Comparative Advantages, in the years 1993 and 2000, to 27 sectors of activity, according to Brucker's (1998) methodology.
[18] Positive values of the RCA index represent a comparative advantage on the part of the EU. Conversely, negative values represent comparative advantage on the part of the CEEC.

comparative advantage increasingly less on sectors intensive on natural resources and cheap labour. Some countries already present slight advantages on sectors intensive in capital and R&D, having progressed to sectors more intensive on capital and to those where differentiation of goods becomes a fundamental factor of competitiveness.

The comparative advantage of the Baltic countries is centred on natural resource intensive sectors, with the industries of wood and its by-products, and oil refinery, significantly contributing to these results. However, in the case of oil refinery, a significant share of these countries' exports is merely re-exports of products coming from Russia and other former USSR countries (Brucker, 1998). Estonia differs from its neighbours since it presents advantage on differentiated products, built on a few electrical and home-appliances components. This can be associated with FDI from Finish firms, within the process of production reallocation (Kaitila, 2001).[19] In the Balkan countries, advantages are based on sectors more intensive in labour and natural resources, while comparative disadvantages are located on industries with differentiated products or intensive in capital and R&D. No significant transformations have been registered on trade patterns, although it is important to note a reduction in comparative advantage on sectors intensive in labour and in natural resources and, conversely, a reduction of comparative disadvantage in capital-intensive products.

[Figure 2 about here]

In the EU countries, there is also a wide range of intra-community trade patterns. Therefore, the so-called cohesion countries[20] present a pattern similar to the CEEC, in spite of having advantage in scale and capital-intensive sectors, a situation that happens only in the Czech Republic, Hungary and Slovakia. However, examining in detail the evolution of these countries' specialisation patterns, it is discernible an increasing approximation to the situation found in the Northern and central EU countries, rather than in the Southern countries, as recognised by Kaitila (2001).

[19] Foreign subcontracting was the major factor behind Estonia's' rapid export growth, where more than 26% of total exports in 2000 were generated by *Elcotec Tallin*. This firm makes cell phone components from imported inputs for Nokia and Ericson.
[20] When referring to this group, only Portugal, Spain and Greece are considered, since Ireland presents a quite distinct situation.

[Figure 3 about here]

In order to complement the analysis, the industries have been aggregated according to the level of technology employed during the production process.[21] The results confirm previous tendencies, emphasising that exchanges became relatively more intense in sectors with higher technological levels, in view of exchanges of low/median technology sectors, both in exports and imports. On the other hand, the EU presents advantage in median/high technological sectors, and a significant disadvantage in sectors of low technological level.

[Figure 4 about here]

Although the results are not surprising, a more detailed analysis uncovers some important specificities (see table 12 in appendix). In sectors of high technology some countries display strong comparative disadvantage in relation to the EU, but others, such as Hungary and Slovenia, already had advantages in 2000. The same tendency can be observed in the trade pattern indicated by the industries' wage levels. This classification, more than suggesting the probable impacts of the CEEC' trade patterns on the distribution of income, also provides indications of comparative advantages in terms of human capital.

[Figure 5 about here]

The relative intensity of exchanges in sectors with high and median wages has increased, reflecting a larger incorporation of human capital on exchanged goods. The EU has advantages in industries with a median/high wage level, whereas the CEEC have advantages in low wage sectors, with the exception of Hungary that has advantage in high wage sectors (see table 13 in appendix). The observed trend entails a reduction of disadvantage of CEEC in median/high wage sectors, thus reflecting a structural change of competitiveness factors.

Summing up: the EU has comparative advantage in goods intensive in human capital and in R&D, and that incorporate median/high levels of technology and wages; these advantages

[21] The aim is getting complementary information on each sector's capacity in terms of implementation of technical knowledge (see Brucker, 1998), using as criterion the share of R&D expenditure contained in the output.

have been gradually declining, suggesting the emergence of a specialisation pattern based on capital intensive sectors and on differentiated goods; such pattern has been gradually substituting trade in sectors intensive in natural resources and non-qualified labour; the strengthening of CEEC-EU commercial relations is increasingly supported by those sectors which are technologically more sophisticated and that have higher human capital contents; nevertheless, there is an increasing divergence of trade patterns of the various CEEC with the EU, thus suggesting different factor endowments, as well as distinct dynamics of integration into the international process of production; Countries sharing a border with the EU have more intense trade relations with its members and have engaged in those sectors where competitiveness is based upon the production scale and product differentiation, hence may in the future compete with current EU countries.

The described trends result from a set of complex factors. The availability of relatively cheap and qualified labour in some countries has supported the change from non-qualified labour intensive activities to others more demanding in terms of human capital. As a result of a reallocation of competitiveness factors in the CEEC, profound changes have occurred in terms of specialisation patterns and trade relationships with the EU (Kaminski, 2000).

In conclusion, CEEC' economic liberalisation changed the relative costs of production factors, causing adjustments in productive structures and trade patterns. However, in spite of all the changes, external trade still reflects the structural effects of centrally planned economies, since structural adjustments are relatively slow (Faini and Portes, 1995). The identified developments suggest that the CEEC are integrating themselves in international productive and commercial chains. In the following section, the analysis will focus on the characterisation of trade taking into account the production stage, since different production functions and different factor intensities are related to distinct stages of the production process.

1.4 - International Segmentation of Production Processes and Trade of Intermediate Goods

International segmentation of production processes is defined by the existence of commercial exchanges of goods belonging to the same branch but located in different phases of the production process. This suggests that segmentation is driven by a particular rational of vertical division of labour within industries. In theoretical terms, the segmentation

phenomenon may be examined in a twofold perspective. It may be considered in the context of production processes of complement segments, or as production operations that are connected and continuous, and follow an upstream to downstream trend. In both cases production is fragmented by the existence of international trade, promoted by changes in countries' competitiveness across the production process.

Firms' international activities have developed as a result of the increasing technological possibilities for each good's fragmentation. In fact, the bigger the technological complexity, the greater are the chances of decomposing a product into sub-systems or components, which may be produced independently in different countries and assembled afterwards into a final product. The establishment of an integrated production system generates intense trade flows of components, and also of intermediate and final goods. Part of such trade takes place within the firm, or under subcontracting and inter-firm agreements.

Firms with global strategies experience consecutive advantages in areas of intra-product exchanges or in segmentation polls, formed by sets of neighbouring countries that have different factor endowments and are distinct in technological terms. The rational behind the segmentation process are cost differentials in several segments of the final product. Firms enjoy specific gains from segmentation, and their competitive advantages in final products reflect the competitive advantages of those countries where the different productive segments are located. Each country's competitive advantages are dependent on the distinct phases of the production process and, as a consequence, one country may have advantages and disadvantages in the different production stages of the same final good. This phenomenon is equivalent to an inversion of the type of comparative advantage, and it is defined as vertical specialisation,[22] in contrast with the classic view of horizontal specialisation at the sector level.

Different factors motivate the reinforcement of this process, but the emphasis is usually put on the rhythm of technological innovation and on the reduction of transport costs. Both have caused quick and profound changes upon countries' competitiveness factors and, as a consequence, upon firms' strategic location. The trade patterns of those countries more integrated in the international division of labour have suffered radical changes that may not always be explained in the context of classic international trade models. The increment of FDI in the CEEC and their gradual openness to trade suggest an increasing level of globalisation, promoted by productive and commercial strategies of Eastern firms.

[22] This concept is distinct from that of vertical and horizontal specialisation based on product differentiation (price and variety), which is dealt with elsewhere in this report.

The most relevant tendencies of CEEC-EU trade are analysed bellow. The focus is on the evolution of the years 1993 and 2000 at the level of the different groups of products. Following the 'Broad Economic Categories' (BEC) classification, trade is divided into flows of primary, intermediate and final goods.[23]

In 2000, intermediate products were responsible for 58% of the CEEC-EU trade (see table 14 in appendix). An increase of 12 p.p. was registered during the period of analysis, being the item 'Parts & Components' (P&C) responsible for a 10 p.p. increase.[24] Primary and consumption goods lost relative importance, and this tendency is observed in most countries and for most exports and imports. However, the magnitude of change was higher in CEEC exports, thus indicating that, during transition, cost structures were quicker to adjust than demand.

[Figure 6 about here]

This tendency suggests that the CEEC reinforced their position in the process of production segmentation at the European scale. However, countries differ in this respect, being such reinforcement stronger in the CEEC-5 than in the Baltic or Balkan countries. Furthermore, trade of P&C was the most dynamic element of the CEEC-5's commercial exchanges, whereas the other countries' progressed mainly in trade of semi-transformed goods, thus reflecting the fact that factor demand differs in the various phases of the production process.

[Figure 7 about here]

Geographical proximity, convergence of technological patterns and availability of qualified labour stimulate this type of trade. As a consequence, the pattern of comparative advantages has been changing considerably. In 2000, CEEC' comparative advantages were mainly in the two ends of the production process - in upstream production (primary goods) and in

[23] Intermediate goods include semi-finished articles and Parts and Components (P&C). Final goods are capital and consumption goods.
[24] By comparison with the cohesion countries, the CEEC are more integrated in the process of production segmentation given that in the former the weight of exports of intermediate products was 43%, a situation unchanged between 1993 and 2000.

downstream production (final goods, especially consumption goods), whereas the comparative disadvantages concerned intermediate and capital goods.

The observed evolution denotes a sharp reduction of comparative disadvantages in capital goods and in P&C, and a reduction of advantages in consumption and semi-manufactured goods. Such trend suggests a convergence of export and import structures, which corresponds to a decline in inter-sector trade. (Kaminski, 2000). Both the greater similarity of those structures and the evolution towards an intra-EU type of trade reflect the gradual catching-up of CEEC' productive and consumption structures.

Albeit in 1993 the CEEC presented relatively homogeneous specialisation patterns, their evolution in recent years has been quite distinct. Romania, Lithuania and Latvia reinforced comparative advantages in primary products. Poland, the Czech Republic and Slovenia started to display comparative advantages in P&C, and Hungary and Estonia in capital goods (see table 15 in appendix).

Considering the trade classification by production phases and groups of products (STCI Rev. 3 one digit), only the section 'Machinery and Transport Equipment' reinforced its weight in CEEC-EU trade, thus suggesting a strong sectoral concentration of trade (see table 16 in appendix). However, when sectors are combined with production phases, only the sections of 'Food and Live Animals' and 'Beverages and Tobacco' did not register an increase in the trade of intermediate products, thus suggesting that the process of production segmentation occurred for the manufactured products of greater technical component.

[Figure 8 about here]

The distinct trade dynamics in the various groups of products gave origin to profound changes in the pattern of CEEC' comparative advantages. In 2000 these countries' exhibit specialisation strengths in 'Miscellaneous Manufactured Articles', 'Mineral Fuels' and 'Crude Materials', whereas their weaknesses are noted in the 'Machinery and Transport Equipment' and 'Chemicals and Related Products'. An inversion of comparative advantage patterns took place across the production stages in the various divisions, but it did not lead to any type of uniform structure.[25] Hence, the CEEC present comparative advantages in the primary and

[25] In the same sector, the same country may present different situations of comparative advantage when the different stages of production are considered. As across the productive chain of one good there are distinct factor demands, in the production

intermediate segments of divisions 2, 3 and 7 (P&C have a bigger weight), and disadvantage in the final goods' segment. Conversely, there are disadvantage in the intermediate segment and advantages in the final stage, in division 6 (includes 'Textiles/Leather'), where imports of semi-transformed goods have considerable weight.

The inversion of comparative advantages across the production process of most classes of goods confirms the reinforcement of vertical specialisation in trade between the CEEC and the EU. However, it is important to consider that each situation is quite distinct in each country, thus reflecting differences in factor endowments and competitiveness, and that factor and technological demands of productive activities in each industry determine different entrepreneurial strategies.

[Figure 9 about here]

'Machinery and Transport Equipment' appears to be the most dynamic class and, as a consequence, the analysis proceeds with its disaggregation, in order to refine the analysis of trade patterns. The results clearly confirm that vertical specialisation has become predominant in the trade of these products. In six out of nine sub-divisions, an inversion of comparative advantages took place,[26] whereas in 1993 this was the case for three sub-divisions only.[27] The trade pattern was not uniform in this respect either, as in four cases the CEEC have advantages in intermediate products and disadvantages in final products,[28] but the reverse situation occurs in the remaining cases.[29] In the sub-classes where inversion of comparative advantages occurred, the CEEC presented a tendency to positive specialisation (reinforcement of comparative advantages or reduction of comparative disadvantages), whereas in cases of horizontal specialisation a loss of competitiveness took place. This

segmentation process each country may have vertical specialisation in some sectors and horizontal specialisation in others - the same type of comparative advantage in all production stages.

[26] In what concerns the Southern EU countries, the inversion occurred in three sub-classes only, precisely those where no inversion occurred in the CEEC. This fact suggests that the two groups of countries have different positions in the segmentation process, meaning that the countries are quite different at the level of factor and technologic endowments (see table 17 in appendix).

[27] The reinforcement of vertical specialisation did not register the same amplitude in different CEEC. The Baltic countries registered inversion of comparative advantages in two sub-classes only, and the Balkan countries in five.

[28] This happens in the sub-classes 71 to 74, where the high P&C content products are included. The CEEC factor endowments are used mainly in the production of intermediate segments that are exported to the EU. However, the scarcity of such goods at the domestic level, coupled with an increasing demand, and the need for equipment goods necessary in production processes, leads to massive imports of final goods in these sectors.

[29] In sub-classes 75 and 76, where telecommunication and computer equipments are included. Here, multinationals have taken advantage of CEEC firms in finishing and assembling of products, sometimes under subcontracting activities in the regime of Outward Processed Trade (OPT).

suggests that transition countries have benefited with production segmentation at the European level.

In conclusion, the reinforcement of trade of intermediate products between the EU and the CEEC, and the redirection from horizontal to vertical specification are the dominant tendencies during the period of analysis. The quick adjustment of both trade and productive structures is due to a re-valuation of factor endowments according to the market, and to the role of FDI in these countries' industrial restructuring and integration in world markets. These had also an impact upon the nature and type of trade between the CEEC and the EU, which is analysed in detail in the following section.

1.5 - Intra-Industry Trade, Vertical Specialisation and Commodity Ranges

In the 60s, empirical analyses revealed that countries import and export similar products, suggesting that the trade patterns would not be in accordance with the traditional theories of factor endowments. This fact has generated some controversy in the literature, as some authors sustained that this type of trade is due to insufficient disaggregation of the data, and others emphasise the need of new theoretical approaches. As a consequence, different concepts have emerged, such as those of the intra-industry trade, the overlap trade or two-way trade - vertically or horizontally differentiated goods.

The explanations of intra-industry trade (IIT) were the starting point to the renewal of international trade theory, and have contributed to the extension of the traditional theory, and also to its dispute. Helpman and Krugman (1985) recognize that products may be horizontally differentiated (variety), originating the relation between inter-industry trade and countries' comparative advantage, and between IIT and imperfect competition.[30]

However, products do not differ only horizontally, but also in terms of price and quality, leading to vertical differentiation Falvey (1981). This distinction alters the traditional theoretical context, as economic and factor differences among countries become the basis for explaining the patterns of inter-industrial specialization. Therefore, the empirical literature introduced the distinction between IIT of horizontally differentiated goods and IIT of vertically differentiated goods (Abd-El-Rahaman, 1986). The former is defined as the

[30] The authors use the concept of "integrated equilibrium" and combine different approaches like the Heckscher-Ohlin model and monopolistic competition.

exchange of similar goods that are differentiated by characteristics other than quality, and is driven by scale economies and imperfect competition. The latter comprises the exchange of similar goods, of different quality, and is determined by differences in endowments.

The determinants and the consequences of the types of trade depend on the nature of product differentiation. The latter became important in the evaluation of countries' adjustment costs whenever the trade patterns change, for instance following the abolition of trade barriers among countries. Therefore, it is assumed that when trade liberalisation is accompanied by IIT, adjustment costs are expected to be smaller than with inter-industry trade. This happens because the increase of specialisation implies the abandonment of all industries with comparative disadvantages, and the unemployment of resources or their displacement to a limited number of export-oriented industries.

To complete the analysis of inter-industrial specialisation patterns, we analyse the characteristics of vertical specialisation between the EU and the CEEC in the last decade, referring in particular the results obtained for the cohesion countries. First, we focus on the aspects of spatial and sectoral dimension of IIT trade based on the Grubel-Lloyd's indicator. Then, we apply the methodology of Abd-El-Rahman (1986) and Fontagné and Freudenberg (1997) on types of trade, ending with the analysis of trade ranges.

[Figure 10 about here]

The approach based on the level of trade overlap is considered by some authors as more appropriate to analyse intra-industry trade among countries with similar factor endowments. The values of the indicator of IIT confirm the increase of this type of trade,[31] that represent about 47% of total EU-CEEC trade flows in the year 2000. Yet, according to Brücker (1998), this value is still inferior to the one displayed by the EU in 1996, in trade with other industrialized countries (58%). Between 1993 and 2000, the global increase was 28% (only Bulgaria and Slovenia did not follow this tendency). We also conclude that there is a convergence on the values for the several countries, and that the Czech Republic, Hungary and Slovenia exhibit much higher values than Portugal and Greece (where IIT has regressed). On the other hand, the values of IIT in bilateral terms (see table 18 in appendix) are clearly

[31] In the present report we analysed IIT from each country relatively to the EU and to each of the trade partners, using the Grubel-Lloyd index. Therefore, we used imports and exports from the EU and each member country to each of the partners. We employed highly disaggregated data (5 digits -SITC classification) from COMEXT (EUROSTAT).

higher in geographically close countries. In fact, the Czech Republic, Hungary and Slovenia have levels of IIT with Germany and Austria clearly higher than those registered among many of the current EU members.

The analysis reveals a positive relationship with the levels of *per capita* incomes, suggesting that differences in incomes and factor endowments may influence IIT. Empirical assessments of IIT determinants performed elsewhere suggest that its increasing relevance in the EU-CEEC trade have been influenced by factors such as economies of scale, labour intensity of production, product differentiation (Aturupane et al., 1997), economic growth, export performance (Hoekman and Djankov 1996) and international segmentation of production processes (Kaminski 2001).

At the sector level, we observe that the Czech Republic, Hungary and Slovenia present greater similarities with the EU countries (see table 19 in Appendix). These countries reveal higher levels of IIT in “Manufactured goods", "Machinery and transport equipment" and "Miscellaneous manufactured articles". However, it is important to refer the different evolution in the EU countries and in the CEEC after 1993. While the CEEC increased the levels of IIT in sectors where it was already important, the EU countries revealed significant reductions in sectors with higher IIT levels, which suggests a substitution of trade flows. This was especially the case of Greece, Austria and Ireland (see table 20 in appendix).

Applying the methodology developed by Abd-El-Rahman, the results reveal that one-way trade prevails, confirming the existence of an inter-sectoral pattern, and the complementarity of factor endowments in the two groups of countries. In the Baltic and Balkan countries, for example, one-way trade represents more than 70% of total trade. However, there are some exceptions, such as the Czech Republic, Hungary and Slovenia (and Spain), which already have a higher weight in two-way trade flows.

[Figure 11 about here]

Comparing both periods, similar dynamics are observed in the different countries, although with different intensities, pointing to the reduction of one-way trade and the increase of two-way trade, especially in vertically differentiated goods. In fact, only the Czech Republic, Hungary and Slovenia have a value 10% higher for the trade of similar goods, and these countries together with Estonia and Poland are the ones with greater growth. This situation

was also observed by Brücker (1998), who considered that IIT between the EU and the CEEC relied on differences in factor endowments. Therefore, it may be concluded that the CEEC are specializing in the production of goods with different contents in human capital and technology.

The pattern of comparative advantage for the different types of trade presents particularities worth taking into account (see table 21 in appendix). In general, the CEEC present disadvantage in the one-way trade and advantage in the two-way trade flows, notably in vertically differentiated goods. In terms of evolution, it is worth noting that the CEEC registered a reduction of disadvantage in the one-way trade and a reduction of advantage in the two-way trade. However, the evolution has been diverse in the different countries, with Hungary, the Czech Republic and Slovenia significantly improving the advantage in horizontally differentiated products, while Lithuania, Poland, Slovakia and Slovenia improve the advantage in vertically differentiated goods. Estonia and Bulgaria display a distinct tendency, improving their competitiveness position on one-way trade.

In spite of the heterogeneity of situations, some quite marked trends may be identified. The most developed countries display better performance in the production of goods where the capacity for horizontal differentiation is the fundamental competitiveness factor (different ranges). This situation should be positively related to FDI flows, industry concentration and product differentiation, and negatively associated with scale economies and labour intensity of production. On the other hand, those countries that reinforced the vertical nature of the specialisation pattern continue building competitiveness on the production of goods intensive in cheap labour and low technological content. Therefore, the basis for product differentiation is price, reflecting the inferior quality of the goods produced, which rely on economies of scale, labour intensity of production and FDI flows.

Comparing with the cohesion countries, only Spain presents comparative advantage above some candidate countries in the production of similar products. Portugal and Greece, in 2000, stand on a position which is lower than that of the Czech Republic, Hungary and Slovenia, due to the progression of these countries in the last few years. This reflects the re-positioning of countries on the comparative advantage hierarchy, and follows the intense productive adjustment in the sequence of the mobility of resources and the change in their relative prices, and the technological human capital upgrading.

[Figure 12 about here]

In terms of sectors, two distinct situations can be observed. In sectors more dependent on natural resources and with low transformation levels, one-way trade dominates, namely in "Food and live animals", "Crude materials…", "Animal and vegetable oils…" and "Chemicals and related products". In what concerns the other sectors ("Beverages-Tobacco", "Manufactured goods…", "Machinery and transport equipment", and "Miscellaneous manufactured articles"), vertically differentiated two-way trade dominates. [32]

[Figure 13 about here]

This evolution did not show a uniform tendency at the sector level, with an almost generalised reduction of advantage in the two-way trade in vertically differentiated goods,[33] and the strengthening of advantage in the two-way trade in horizontally differentiated goods. This indicates a positive evolution in the trade pattern on the aggregate, revealing increased adjustment capacity in the different industries.

In view of the faster dynamics of trade flows in the vertically differentiated two-way trade, it is important to identify the market segments where the CEEC exports are positioned, and compare them with the situation of some EU members. Therefore, it is important to define the quality ranges of exports of each country, and compare them with the average quality ranges imported by the EU. As in other studies,[34] unit values were considered a proxy for quality, in the sense that the price level reflects the quality of the exchanged goods.[35] With this aim, the price-quality structure of all CEEC and Cohesion countries' exports has been examined,[36] with reference to the average unit value of imports of the EU. The situations were typified into three categories: 1) whenever the first is above the second by more than 15%, the flow is considered high quality; 2) if the first is below the second by more than 15%, the flow is classified as low quality; 3) all other cases are considered medium quality.

[32] Complete product denomination is supplied in the appendix.
[33] However, the comparative advantages for the three types of trade have improved in the Machinery and transport equipment sector, resulting in increased competitiveness of the CEEC in this sector for all types of goods.
[34] See, *inter alia*, Fontagné and Freudenberg (1997) and Freudenberg and Lemoine (1999).
[35] Therefore, by comparing the unit values of exports of different countries for a given market it is possible to identify the position in the competitiveness scale of each country, allowing a hierarchy between competitors.
[36] Using the methodology of Freudenberg and Müller (1991).

[Figure 14 about here]

Although a favourable evolution has occurred (from 70% to 56%), exports from the CEEC to the EU are mainly composed of low quality products (see table 22 in appendix). The weight of high quality goods in those countries' exports is still low, in spite of having almost doubled, from 9,5% to 18%. Cohesion countries present a more balanced and more stable trade structure. In 2000, for instance, the share of low quality goods in Spanish exports did not exceed 46%. However, on average terms, the two groups are getting closer, given that in countries such as Estonia, Slovenia and Hungary the weight of exports of high quality goods to the EU was higher than that of many Cohesion countries.

The evolution was not too disparate across countries, since only Lithuania and Latvia reinforced their share of exports of low quality goods. However, there are clear differences between countries at the level of export ranges. For instance, the weight of high quality goods varies from 46,5% to 9% in Estonia and Bulgaria, respectively. According to Brücker (1998), the decrease of low range exports in the CEEC is associated with the reduction of resources' exports and with the increase of exports of goods with higher technological content. Thus, we have concluded, in accordance with Freudenberg and Lemoine (1999), that the position of the CEEC in terms of quality/range suggests a clear qualitative labour division between the EU and the CEEC, though increasingly heterogeneous in the latter countries.

In what imports are concerned, there are also differences between the CEEC and the Cohesion countries in terms of price-quality structures, though less significant than those referred in the analysis of exports (see table 23 in appendix). In fact, whereas in the EU countries imports are mainly of medium and high quality range products, in the CEEC imports of low quality goods are predominant.

[Figure 15 about here]

However, the evolution was distinct, since the Cohesion countries increased the weight of imports of low quality range, and the CEEC reduced the percentage of this type of imports, thus showing a higher convergence of the price-quality structure. The increasing sophistication of consumption habits in the CEEC, coupled with higher economic growth

and a gradual increase of purchasing power, reflects a progressive economic convergence between the two groups of countries in the last decade.

[Figure 16 about here]

In fact, the pattern of relative comparative advantage on the different ranges was not much different in the CEEC and in the Cohesion countries in 2000, since all these countries present comparative advantage on trade of low range products, and only Portugal, Spain and Estonia do not have disadvantage on high quality products. In terms of the CEEC, the dynamics was directed at reducing the disadvantage in high quality products and reducing advantage on low quality goods (see table 24 in appendix).

Given the substantial differences in the values of exported and imported goods, the increasing weight of IIT in the CEEC-EU trade does not result from the equalisation of the traded goods' factor contents. Thus, the relative decline in inter-industrial trade has coincided with a specialisation pattern in down-market products in the CEEC, but with some exceptions (Hungary, Slovenia and Estonia). Boeri and Brücker (2000) found a similar path and consider, therefore, that a scenario of specialisation in processes that are human capital intensive and labour intensive may be identified, respectively, in the EU and in the candidates.

The increasing share of IIT, the narrowing differences in the structure of inter-industrial trade and the reinforcement of exchanges of capital and R&D goods, correspond to an accentuated wage and technology upgrading in the CEEC. On the essence of this structural tendency is the behaviour of multinational companies which, through intra-company trade and sub-contracting, stimulated segmentation of the productive process in human capital and labour intensive activities, by exploring differences in labour costs. In this context, the Southern EU members should fear more the economic impact from the potential increase of industrial displacement than the direct effects of trade diversion in the EU markets.

Most current candidates are poorer than Portugal, Spain and Greece were when these countries entered the EEC. However, the CEEC are already more integrated with the EU than those countries were at that time.[37] Given that most productive adjustments have already occurred, and that almost all trade barriers have been dismantled, the impacts of enlargement on trade should not have generalised effects. Therefore, higher or lower competitive

[37] According to Kaminski (2001), the pattern of trade between the EU and the CEEC has evolved during the last decade as a consequence of the *European Agreements*, which reinforced incentives for EU firms to locate production units of the same supply chain in different CEEC, or to outsource other partners.

difficulties for some sectors and/or countries will result from internal adjustment dynamics in both transition economies and current EU members.

1.6. Concluding Remarks

In spite of strengthened CEEC-EU trade relations, the results suggest the existence of room for further growth, as income levels converge and economic reforms consolidate in the candidate countries. Income and distance positively affect the volume of trade, indicating that economic and geographically closer countries are more capable of expanding bilateral trade, although they may also suffer greater competitiveness effects due to reciprocal openness. Therefore, the impacts on trade relations are quite different in each country either in the EU or in the CEEC. Moreover, the trade effects on global economic growth are expected to be asymmetric. Due to the fact that the EU trade relations with the CEEC represent only 1% of the EU's GDP, the effects in the EU are likely to be small when compared with the effects in the CEEC.

The sector pattern of trade registered profound changes, reflecting the gradual shift of the CEEC' exporting structures to sectors more intensive in technology, with higher wages and more anchored on products intensive on natural resources and labour. There is, however, a strong heterogeneity at country level, suggesting that geographical proximity to the EU and income convergence stimulated trade of products intensive in R&D and capital, and of differentiated goods. Accordingly, the patterns of sector specialisation of the countries closer to the EU, and the Baltic and Balkan countries, present already quite distinctive characteristics.

The expansion of trade of intermediate products, and the emergence of a profile of vertical specialisation, confirm the progressive and fast insertion of CEEC in the international division of the productive process at the European scale. This phenomenon of production segmentation reflects the revaluation of factor endowments according to a market logic, and extended not only to traditional industries (as happened before to textiles-clothing, through the outward processing trade regimes) but also the sectors of machinery, automobile and telecommunications material.

The nature of CEEC-EU trade still reflects the strong factor complementarity between the two groups of countries. In fact, situations are also differentiated here, and the results demonstrate that trade of vertically differentiated products has been assuming a significant

share in the exchanges between the EU and the more central candidate countries. However, CEEC and EU exports continue to be based upon goods of different ranges, implying that those countries present advantage in the trade of low quality products. This distinct positioning in the price/quality range suggests a qualitative division of labour between the two groups of countries, naturally with some exceptions.

2. Foreign Direct Investment

The beginning of the transition process in the CEEC witnessed a remarkable increase in FDI flows to the region. Although not equally benefiting all countries, such growth in external investment has been an important source of financing for economic restructuring and development. In addition, FDI is usually considered the fastest way of transferring market-orientated business culture to the previously centrally controlled economies. The latter is especially important, given the plans of EU membership shared by all these countries.

A number of studies have focused, both theoretically and empirically, on the motives that lead entrepreneurs to engage in international application of direct investment funds, and on the motives that make some locations more attractive for certain types of projects than others. At the EU level, reduction of overall risk is probably one critical aspect, since every enlargement has generated an increase of FDI flows to the new members. In the case of the CEEC however, the transition to a market economy and the projects of future participation in the EU have, in most cases, *a priori* triggered the process.

In this analysis, robust econometric techniques are employed to model FDI flows, to identify their main determinants, and to try to anticipate future trends of foreign investments in the CEEC and in the so-called cohesion countries. The latter is done with the objective of ascertaining diversion of direct investment funds from peripheral EU countries to the CEEC.

This part of the report is organised as follows: section 1 describes the evolution of FDI to the CEEC from 1990 to 2000; in section 2 the empirical literature on the determinants of FDI to

transition economies is briefly reviewed; section 3 contains the empirical estimation of a gravity-type model and the interpretation of the obtained results; section 4 concludes.

2.1 – FDI in the CEEC: Characteristics and Trends

Since the political changes in the beginning of the nineties, when the CEEC' governments became particularly eager to attract foreign direct investment, there has been a continuous increase of FDI to the region. Figure 17 displays this trend of global FDI inflows to the CEEC, both as a ratio of GDP and of population.

[Figure 17 about here]

There is an evident structural break in the trend in 1995, when FDI inflows almost doubled. In spite of a slight drop in the following year, the value doubled again in the second half of the nineties, reaching around 20 bn. USD in 1999, almost 6% of the region's total GDP. In terms of economic sectors, and according to Eurostat data, FDI in the CEEC is primarily directed at manufacturing activities, followed by "trade and repairs" and financial intermediation.

This global growth trend is clearly dominated in absolute terms by the group of Vizegrad countries (Poland, the Czech Republic and Hungary), which accounted for 81.5% of total FDI inflows to the region in 1999 (Table 6). Poland, by far the most important recipient since 1996, is also the most consistent, maintaining an almost constant continuous growth rate during the whole decade.

Within this group, Hungary has registered a negative trend in absolute terms, since its peak value in 1995 (when it was the main recipient in the group), being surpassed by Poland in 1996 and the Czech Republic in 1998, but remaining however the third biggest FDI attractor. This negative trend possibly reflects the privatisation schedule, almost completed in 1999.

[Table 6 about here]

Examining the ratio between the stock of inward FDI and population in 1999 (last column on the right hand side of table 6), it is clear that the CEEC have not yet reached the levels of the EU countries (with an average value of around 4600 USD), suggesting the continuation of a growth trend of FDI inflows above the average of the EU (Bulgaria and Romania present particularly low levels). Hungary is probably an exception, having reached values close to those of Portugal and Spain (two of the lowest in the EU), for example, which partly explains the above-mentioned recent drop in FDI to this country.

By combining flow and stock data, figure 2 illustrates the dynamics of FDI flows to the CEEC. It presents the ratio of FDI flows in the period 1995-99 and in 1999 to the stock of FDI in 1999. High values of this ratio indicate that a high proportion of the FDI stock was established during the period or year considered. This was the case in the Czech Republic, Bulgaria and Poland, where the ratio exceeded 25% for 1999 and 80% for the second half of the nineties. On the other extreme, low ratios indicate that FDI stocks have been mostly build up in previous years, with a relative decline in the most recent years. Examples are Slovenia, Slovakia and, most notably, Hungary. As a comparison, Spain and Portugal present lower ratios for the period 1995-99.

[Figure 18 about here]

In relative terms, however, the most prominent host countries of FDI are the Czech Republic, Estonia, Hungary and Latvia. The weight of FDI in these economies represent on average more than 5%, well above all the others. These values for the CEEC are generally also higher in the same period, with the exception of Bulgaria, Romania and Slovenia, than those for the two Iberian countries, Portugal and Spain.

[Figure 19 about here]

It is also interesting to compare the values for the CEEC in this pre-adhesion period with those registered in Portugal and Spain (PS) when they entered the EEC in 1986. Some similarities may be found in the economic and social conditions of these two groups of countries, in at least two aspects: they both emerge from dictatorships which have blocked

international transactions with the rest of Europe; both initiated in these periods a process of privatisations, a traditionally strong factor to attract FDI. As may be observed in figure 3, FDI inflows in Portugal and Spain have risen considerably in the second half of the eighties, after adhesion, falling afterwards, presumably as the privatisation process slowed down.

A similar phenomenon can be observed for the two other enlargements since 1980. Although in a period of considerably higher barriers to capital flows, Greece's (G) FDI inflows rose in the beginning of the eighties (Greece entered the Union in 1981), presenting twice the values of the EU's average. The same happened with the last enlargement in 1995. When Austria, Sweden and Finland (ASF) got membership in 1995 they became more attractive to foreign investors and are still, nowadays, the main destiny for FDI in the Union.

A very large share of CEEC inward FDI flows originates in EU members, especially Germany, the Netherlands and Austria. Figure 4 highlights these three countries' contribution to each CEEC during the nineties. German investors were the main provider of FDI, preferring the neighbours Poland, the Czech Republic and also Hungary.

[Figure 20 about here]

In global terms, more than half the FDI flows circulating in the world involve the EU, with the EU's outward flows to the CEEC still representing a very small proportion. Overall, EU's FDI flows to South American, or even Central American, countries are significantly larger and more rapidly increasing than to the CEEC. The recent attractiveness of these three blocks of countries probably resides on similar determinants: economic liberalisation and privatisations. However, EU's flows to the CEEC have dropped in relative terms, from 19% of total EU' FDI (excluding intra-EU and the USA) in 1995 to 13% in 1999 (Passerini, 2001). Poland, the Czech Republic and Hungary have, again and by a large margin (89%), been the most privileged destiny of EU capital during the nineties, although the latter seems to be loosing some appeal.

FDI has been very important in financing these countries' current account deficits. Figure 5 compares net capital inflows with the current account balance of the group of ten CEEC between 1994 and 1999. Only in Estonia, Lithuania, Romania and Slovakia were net FDI inflows not sufficient to entirely cover the current account deficit, on average, in this period.

This shows the importance of FDI relatively to other components of the Balance of Payments financial account, such as portfolio investment, suggesting feeble financial markets.

[Figure 21 about here]

2.2 – FDI Determinants: the Empirical Literature

As referred by Lankes and Venables (1996), FDI projects in the CEEC are very heterogeneous, differing in terms of magnitude, objectives, technology, geographical location, ownership, and control structures. This distinctive character reflects a variety of motivations on the part of the suppliers of direct investment funds.

A number of reasons may influence an entrepreneur's decision to invest abroad, but they all share the common feature of being in harmony with the optimum management strategies of multinational corporations. FDI may be broadly classified into two categories: market-seeking FDI, or FDI that aims at exploiting the advantages of being close to the consumer market, and efficiency-seeking FDI, which is implemented with the objective of exploiting cost advantages in different locations.

In addition to theoretical analysis, researchers have put considerable effort on the empirical identification of FDI determinants. In what concerns FDI directed to the CEEC, the two main approaches have been survey-type studies and formal quantitative analyses. Examples of the former may be found in Lankes and Venables (1996). Quantitative studies of the determinants of FDI are based on a number of different models, being the gravitational approach the most commonly adopted. Gravity models were firstly used in the 60s, in the analysis of international trade, but were subsequently also employed to model and explain FDI flows. In recent years, the issue of FDI to transition economies has been investigated mostly by means of econometric estimation of gravity type models.

A simple and straightforward version of the gravity approach is adopted in Brenton and Di Mauro (1999) to analyse FDI flows to the CEEC and to evaluate the possibility of a future surge in such flows. In their model the dependent variable - a bilateral FDI flow - is explained in terms of GDP and population of the host country, and of the distance between host and home countries. The data sample extends from 1992 to 1995 and comprises Germany, France, the UK and the USA, as investing countries, and a panel of around 35 host

destination countries that includes the transition economies. The results show that FDI is positively affected by GDP, but market size, as proxied by the population, does not appear to significantly affect FDI flows. The coefficient on distance is significant and negative. *A priori*, distance may be expected to affect FDI both positively and negatively. In fact, FDI may substitute exports in distant markets, leading to a positive link between the two variables. A negative connection may also emerge since the costs of operating affiliates in foreign locations increase with distance. The latter appears to be the dominant explanation in this study, in all countries except the UK.

The same model applied to a larger data sample, including more destination and investing countries and a wider temporal horizon (1982 to 1995), is used by Brenton, Di Mauro and Lücke (1999). The outcomes of the model, however, are qualitatively identical to those of the previous analysis. Other results suggest that trade and FDI are complements, and that FDI flows to the CEEC appear not to have been diverted from other European locations.

This last result of non-diversion of FDI flows is confirmed by Buch, Kokta and Piazolo (2001) for the cases of Portugal and Spain, but not for Greece. Their empirical assessment is based on a gravity model that includes the above-mentioned three explanatory variables plus the ratio of the host country's imports (or trade) to GDP, as a proxy of openness to foreign trade, and the ratio of M2 to GDP, as a proxy of the size of host countries' financial systems. The model is estimated using data from 1990 to 1997 and suggests that the decline that may be observed in FDI flows to Southern European countries reflects an adjustment process towards a long-run equilibrium. The empirical assessment of FDI determinants, which is performed with data on eight source countries (five core EU countries plus Japan and the US), provides mixed results. GDP coefficients are mainly significant and positive, and distance coefficients are practically always negative and significant. As in previous studies, population appears not to explain FDI. In what concerns the variables included to proxy trade openness and financial system's size, the results are robust only for the former, which appears to positively influence FDI, as *a priori* anticipated by the researchers.

An important contribution is added to the empirical analysis of the determinants of FDI to the CEEC in Bevan and Estrin (2000), who explicitly take host countries' risk into account. Risk is associated to credit rating, which in turn is explained by macroeconomic, transition and *environmental* factors. Their analysis is also based on a gravity-type model, and the data sample contains FDI flows from 18 market economies to 11 transition countries, from 1994 to 1998. The results show that FDI is determined by host country risk and size, labour costs

and distance. Contrary to what is sometimes argued, on the basis of the Iberian integration experience, this research finds evidence that announcements concerning the future admission of CEEC to the EU tend to influence FDI positively and directly, and not via credit rating. According to these results, such announcements do not affect the rating of these countries directly. It is the subsequent increase in FDI that improves economic performance and, ultimately, improves credit rating.

Due to problems related with data availability and reliability, most empirical studies on FDI are performed using aggregate data. However, the heterogeneous character of FDI projects makes it interesting to investigate whether FDI in different sectors is triggered by different motivations. Two attempts to clarify this matter may be found in Resmini (2000), and in Altomonte (2000), who base their analyses in the same detailed data set of European firms' foreign investments in the CEEC, which takes into account the specific characteristics of each project. Resmini's results suggest that market and strategic issues prevail on vertical (or export orientated) investments. Progress in transition is also found to be an important determinant for capital-intensive sectors, whereas wage differentials tend to attract traditional and science based sectors. Altomonte concludes that FDI appears to be influenced by GDP *per capita* and by population, but not by distance, whereas in previous analyses it is the coefficient on population that usually is non-significant. Wage differences are also found to be positively related to FDI, but a variety of other factors that the author takes into account appear not to be significant.

The scarcity of data relative to FDI in the CEEC creates important constraints to the development of econometric analyses. One strategy to minor this problem is to use panel data techniques in the estimation process. Examples of studies that followed this approach may be found in Lansburry, Pain and Smidkova (1996), and in Holland and Pain (1998). The former try to identify the determinants of FDI from 14 OECD countries to the Czech Republic and Slovakia, Hungary and Poland, from 1991 to 1993, focusing on the privatisation process and on the trade linkages between host and investor countries. The set of explanatory variables also includes country risk, the cost of labour, expenses in energy consumption and the relative stock of patents in the host country. The results suggest that FDI patterns are positively affected by the privatisation schedule, the research base (as proxied by the number of patents) and trade links.

Holland and Pain (1998) focus on the importance of variables such as the privatisation process, overall risk and relative labour costs. They examine the period from 1992 to 1996,

considering as host economies the ten CEEC with EU accession agreements plus Croatia. After a variety of econometric analyses designed to explore alternative model specifications, the authors conclude that the privatisation method is an important determinant of FDI after controlling for market size, and that governments may strengthen this link by improving the prospects for macroeconomic stability. The estimated coefficients on labour costs are statistically significant, therefore highlighting the importance of efficiency-seeking investment projects in the region.

In what follows, we try to extend the existing empirical literature on the subject of FDI determinants by employing a more updated sample of data, by adopting a more robust econometric technique, and by including some variables not previously taken into account.

2. 3 - Empirical Analysis

In order to study the determinants of bilateral foreign direct investment flows, a gravity type model is estimated using a panel data approach for the period 1993-1999 (whenever data is available). Unlike most previous empirical studies, bilateral common effects are considered in the model, to take into account all unobservable country-pair specific effects that are time-invariant (geographical, historical, political, cultural and others) and may affect FDI flows between two countries. Recent papers on the econometric specification of gravity models argue that the inclusion of bilateral effects is more general and may produce better estimates than the traditional specifications (see for example Egger and Pfaffermayer (2000)). Moreover, it is stressed that this approach also gives better in sample predictions.

The following model is the basis for the empirical analysis:

$$\ln(FDI_{ijt}) = \alpha_{ij} + \gamma_t + \beta_1 \ln(GDPcap_{it}) + \beta_2 \ln(GDPcap_{jt}) + \beta_3 \ln(pop_{it}) + \beta_4 \ln(pop_{jt}) + \beta_5 \ln(open_{jt}) + \beta_6 \ln(CL_{ijt}) + \beta_7 \ln(dist_j) + \beta_8 Frontier + \varepsilon_{ijt},$$

where *GDPcap* stands for GDP *per capita* in the origin country (i) and host country (j), *pop* is the population of origin country (i) and host country(j), *open* is the degree of openness of the host country, proxied by the ratio of trade to GDP, *CL* are compensation levels of host country in relation to compensation levels of the origin country,[38] *dis*t is the geographical distance between the two countries and *Frontier* is a dummy variable taking the value one

[38] Compensation levels comprehend total hourly compensation for manufacturing workers, including wage and supplementary benefits (World Competitiveness Yearbook, 1999)

when the countries share a common border. The specification also includes time dummies (g_t) to take into account business cycle effects.[39]

The common bilateral effects (a_{ij}) can be treated as being random or fixed, depending on the data sample. If the common specific effects are correlated with the explanatory variables, a fixed-effects model should be adopted. The Hausman test can be used to test for such correlation. In our case, the test did not reject the null hypothesis of no correlation between the common specific effects and the regressors. Therefore, a random-effects model is adopted and the GLS is employed to obtain consistent and efficient estimates. The results are displayed in table 7.

[Table 7 about here]

These estimates suggest that FDI flows are positively influenced by the GDP *per capita* and trade openness of the host country,[40] and negatively by distance and relative labour compensation levels. The GDP *per capita* of the country of origin and the fact that investing and host countries share a common border do not seem to affect FDI. Population of the host and of the investing countries are both significant and positively related to FDI.

Such results indicate that, as suggested by theoretical analyses, both market and efficiency motives determine decisions to invest abroad. The positive relationship between host country's GDP *per capita* and population imply that the number of potential consumers and their hypothetical purchasing power are taken into account by international entrepreneurs when deciding the international allocation of investment funds. This is obviously the case of those projects directed to the supply of foreign markets. The negative relationship between labour compensation levels and FDI sustain the rational for efficiency seeking FDI. In fact, some projects are implemented abroad with the objective of reducing production costs and are therefore attracted to areas where labour is less expensive, independently of its inherent qualification and/or productivity.

In contrast with the majority of previous empirical research, our study uncovers a positive relationship between FDI and the population of host and investing countries. The former

[39] See Appendix for sample data description and sources.
[40] The degree of openness of the host country is statistically significant at the 1% level in the second model and significant at the 12% level in the third. These outcomes suggest that there is in fact a positive significant relationship between the two variables.

appears mainly in studies developed with disaggregated data and is rare in those using total FDI flows. Our results are therefore in accordance with the outcomes of analyses performed with more detailed databases. The latter relationship, *i.e.* that between FDI and population of investing country is usually not tested. However, this positive link indicates that the larger the population, the more probable it is for domestic entrepreneurs to engage in foreign investments. A possible justification is that firms in more populated countries have higher possibilities to reach internally the minimum efficient scale that is necessary to support the structures for international expansion. Countries that are relatively less populated, and that have relatively small potential demand, are less stimulating and less capable of generating the appropriate environment for the emergence of large-scale firms, that are those which are most probably prepared to expand their activities at the international level.

The positive relationship that appears to exist between host country trade openness and FDI inflows suggests that trade and FDI are complements and not substitutes, as it is sometimes argued. This result supports the argument that FDI is associated with the intensification of production segmentation, thus increasing the number of commercial exchanges at the international level.

The estimation results, and more specifically those of specification (3) are used to perform in-sample predictions of FDI flows to Portugal, Spain, Poland, the Czech Republic, Slovenia and Hungary. The objective is to assess FDI diversion from the EU periphery to the CEEC, by means of comparative analysis of the potential and current flows to these countries. It would be reasonable to expect potential values to be bellow observed ones in the CEEC (values below unity in the indicator displayed in table 8), considering that these countries still hold FDI stocks below the volumes observed on average in the EU. The same could be expected to happen in the EU's Southern members, although with lower magnitudes, given that they also still present values much lower than the Union's average. In the calculus of FDI potentials, only the FDI flows of the major investors in Europe are considered: Austria, Germany, Netherlands and France. The results are displayed in Table 8.

[Table 8 about here]

As expected, it may be concluded that there are not much difference among the several countries' results. In most cases the displayed values are below unity until 1998 (slightly lower

for the CEEC but not as much as expected), and above unity in 1999. This latter result may suggest either a transitory phenomenon or that FDI stocks are already reaching their equilibrium levels in comparison with countries of similar characteristics in terms of the major determinants of FDI identified in the model. Therefore, no evidence is found of diversion of FDI flows from the Southern countries to the CEEC in these years. This does not guarantee, of course, that it could not happen in the future, as accession takes place and new developments unfold.

2.4 - Concluding Remarks

The empirical assessment of the determinants of FDI suggests that international investments are mainly determined by host country characteristics such as its dimension, potential demand, openness to world trade and lower relative labour compensation levels. In terms of the investing country, the only significant feature is its population, which appears to be positively related with the supply of FDI funds. These results suggest that in the future, countries such as Portugal, which is relatively less populated than other EU members and than most CEEC may have problems in attracting foreign investments. This may be the case due not only to the existence of a reduced potential demand but also to the fact that its purchasing power is also low. Countries with such features may become non-interesting for those investors engaged in market-seeking FDI. However, if the labour force is relatively cheap, even if not especially qualified, the area may continue to exert some attraction for efficiency-seeking investors.

Using a world macroeconomic model, Breuss (2001) predict that the effects of enlargement on FDI flows will spur economic growth in the CEEC, especially due to capital accumulation and the renewal of capital stocks (as Baldwin *et al.*, 1997, had stressed before), but negatively affect growth in the current EU members, especially in the Southern countries (an asymmetry also noted by Baldwin *et al.*), either due to a diversion effect or to a crowding-out effect.

Possible FDI diversion was also empirically assessed. With the objective of examining whether the observed volume of FDI flows were above or below the potential values suggested by the model, in-sample predictions were performed for several CEEC and Southern EU countries. The results suggest that, contrary to what could be expected, there is no evidence of FDI diversion from the Southern European countries to the CEEC. These results suggest that the trends observed in FDI flows to these countries in the last few years

merely reflect the expected upsurge of FDI inflows in the wake and immediately after accession, and the gradual downturn some years later, when FDI stocks reach a certain equilibrium level.

Even though there is no evidence of FDI diversion from EU peripheral countries, the empirical analysis suggest that these are the areas where more attention should be paid to the issue of attracting and maintaining foreign investments. These regions are known as suppliers of cheap and low qualified labour, and may therefore be of some interest to a number of investment projects, but are also relatively poor, weakly populated and distant from the EU core, which is an important source of direct investment funds. Efforts should therefore be focused on the implementation of structural reforms capable of generating the necessary conditions to attract market-seeking FDI and upgrade the demand for efficiency-seeking projects.

Conclusions:

Foreign direct investment is a quick way of transferring technology and efficient management practices, thus stimulating domestic firms integration into global markets. International corporations create global production networks based upon intra-firm trade, hence stimulating the emergence of complex intra-industrial specialisation patterns, extended to the exchange of products in all stages of production. Throughout the report there are indications that FDI flows play an important role in the process of transformation of trade structures in the CEEC. Firstly, the high volume of FDI appears to have contributed to the transformation of these countries' specialisation patterns, leading to the gradual consolidation of export structures based upon products that are intensive in technology and in qualified labour. Secondly, in almost all CEEC, the structural changes in trade composition were consolidated by an increase of IIT in total trade. Such situation was particularly notorious in the countries receiving the highest amounts of FDI, thus suggesting a positive link between the two. Finally, FDI has stimulated the gradual insertion of the CEEC in the process of global division of labour, which is the basis for the process of international segmentation of production.

The preferential access to EU markets, coupled with the liberalisation of CEEC' domestic markets, promoted changes of specialisation patterns in these countries. However, national options in terms of economic policy have constrained the rhythm and intensity of those

changes. Those who adopted more radical liberalising reforms, and applied wider programs of privatisation and macroeconomic stabilisation, have attracted higher amounts of FDI and have progressed further in economic terms.

The remaining question is whether past convergence trends of the CEEC towards the EU are sustainable in the context of membership. In spite of FDI driven structural changes, there appears to exist space for further restructuring of domestic firms, especially in relatively protected sectors. On the other hand, in spite of the abolishment of trade barriers between the CEEC and the EU, enlargement may create additional competitiveness problems in the former, due to the adoption of the Common External Tariff in relation to third countries (which is lower than current tariffs). In addition, the functioning of the single European market is quite demanding in relation to the harmonisation of product characteristics and of the technical aspects of production, and this corresponds to the raising of non-tariff barriers.

Finally, a particular note on the specific role of the EU's southern countries on enlargement. Similar trade patterns in the CEEC and in those countries suggest higher competitiveness in the access to the EU markets, especially bearing in mind that differences between them have been shrinking during the last decade. The progress of some countries in EU markets, namely Hungary, the Czech Republic and Slovenia, puts them in a equal or even higher plan in terms of nature and intensity of trade, quality of exports, and position in the multinational networks. Some fears still persist on the reinforcement of the CEEC' credibility after accession and, consequently, on more favourable conditions to attract FDI, which may divert FDI flows from the southern countries. However, our results do not support such a scenario.

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Tables

Table 1: Openness and Trade Balance (% GDP)

	Openness Level		Trade Balance	
	1993	1999	1993	1999
Slovenia	92.9	89.1	-3.5	-7.8
Estonia	45.7	139.3	-4.7	-12.6
Latvia	48.6	93.3	9.3	-15.2
Lithuania	73.0	72.3	2.8	-13.5
Bulgaria	76.8	88.2	-12.3	-11.5
Czech Republic	76.5	98.6	-4.9	-5.0
Slovakia	90.7	111.2	-9.2	-2.3
Hungary	57.5	103.2	-9.6	-3.0
Poland	38.6	44.7	-6.3	-11.4
Romania	41.8	56.3	-4.9	-2.5
CEEC10	**56.1**	**70.3**	**-6.2**	**-6.4**
Spain	29.7	43.1	-3.4	-5.9
Greece	33.5	30.2	-14.8	-14.0
Portugal	47.4	58.3	-11.3	-15.1
European Union	**40.9**	**50.6**	**0.7**	**0.7**

Source: Own Calculations based on CHELEM database - CEPII.

Table 2: Trade flows and trade balance with the EU (% of Total)

	Trade balance		Exports		Imports	
	1993	**1999**	**1993**	**1999**	**1993**	**1999**
Slovenia	157.9	113.8	63.5	66.5	70.3	74.1
Estonia	128.6	55.2	51.6	64.7	66.1	63.1
Latvia	80.2	8.4	57.2	64.3	46.3	48.6
Lithuania	123.1	32.4	35.8	54.7	28.9	47.7
Bulgaria	45.7	42.2	33.3	51.4	36.7	49.2
Czech Republic	116.9	75.5	51.5	68.0	59.4	68.8
Slovakia	24.6	-119.1	32.5	60.4	31.1	53.0
Hungary	56.3	35.0	59.7	73.0	58.7	70.8
Poland	63.2	68.5	68.4	69.8	66.9	69.3
Romania	70.8	78.9	41.3	64.9	47.5	66.1
CEEC10	**66.3**	**57.2**	**53.9**	**67.3**	**56.4**	**65.6**
Spain	58.4	69.1	70.5	71.2	68.0	70.7
Greece	70.0	77.8	59.3	50.0	65.8	67.6
Portugal	74.2	77.8	79.3	82.2	77.3	80.4

Source: Own Calculations based on CHELEM database - CEPII.

Table 3: Estimates of the Gravity Model on EU / CEEC trade flows

(Fixed Effects Estimates)

Variable	(1) Country-specific effects			(2) Bilateral common effects		
	A	**B**	**C**	**A**	**B**	**C**
	Coeffic. (St. Err.)	*Coeffic. (St. Err.)*	*Coeffic. (St. Err.)*	*Coeffic. (St. Err.)*	*Coeffic. (St. Err.)*	*Coeffic. (St. Err.)*
Sum of GDP	1.057* (0.018)	1.067* (0.021)	1.075* (0.022)	2.960* (0.186)	1.476* (0.235)	1.497* (0.251)
Similarity	-0.146* (0.010)	-0.100* (0.010)	-0.100* (0.010)	0.038* (0.017)	0.003 (0.015)	-0.002 (0.019)
Economic Distance	0.055* (0.024)	-0.084* (0.028)	-0.077* (0.030)	-0.459* (0.088)	-0.419* (0.088)	-0.335* (0.109)
EU	1.566* (0.060)	1.267* (0.069)	1.063* (0.071)	_	_	_
Baltic	-0.885* (0.047)	_	_	_	_	-
Distance	-1.287* (0.027)	-1.011* (0.031)	-0.973* (0.031)	_	_	_
Frontier	0.540* (0.053)	0.651* (0.053)	0.593* (0.052)	_	_	_
Exchange Rate	_	-0.960* (0.128)	-0.938* (0.128)	_	-0.510* (0.048)	-0.615* (0.045)
Exch. Rate Volatility	_	_	-0.212 (0.174)	_	_	-0.269* (0.065)
Constant	0.334 (0.289)	-1.274* (0.344)	-1.415* (0.352)	-31.471* (2.364)	-12.456* (3.085)	-12.681* (3.328)
N	3864	2394	1981	3864	2394	1981
Std.Dev. Residual	0.803	0.661	0.604	0.344	0.215	0.172
R-squared	0.896	0.902	0.909	0.983	0.991	0.993

All variables are in logs. Dependent variable is the logarithm of bilateral exports. Variables definition, countries used in regression, data sources and other methodological issues can be seen in Appendix.

(*) Denotes values significant at 5% level

Table 4: Potential versus Current Exports and Imports [a]

(Potential / Current percentage deviation [b])

	EU Exports			EU Imports	
	1993	**1999**		**1993**	**1999**
Origin-country			**Destination-country**		
Austria	-6,73	5,92	Austria	-7,38	5,70
Bel-Lux	12,43	-19,42	Bel-Lux	19,00	-18,60
Denmark	-12,97	5,93	Denmark	-19,50	3,49
Finland	2,33	13,06	Finland	-1,04	19,22
France	10,50	-16,99	France	-9,61	-8,61
Germany	9,17	-13,77	Germany	-2,41	-8,69
Greece	-22,00	6,83	Greece	1,42	20,55
Ireland	31,26	-11,69	Ireland	-30,48	-25,91
Italy	6,45	-3,60	Italy	4,46	-8,19
Netherlands	-14,15	4,05	Netherlands	-21,57	-4,30
Portugal	72,79	-34,52	Portugal	10,76	-28,85
Spain	35,01	-14,24	Spain	24,24	-11,69
Sweden	19,83	-9,96	Sweden	22,84	-3,94
United kingdom	-4,26	18,05	United kingdom	-4,43	-0,98
Destination-country			**Origin-country**		
Bulgaria	-15,17	-4,57	Bulgaria	12,52	13,20
Czech Republic	11,54	-7,80	Czech Republic	-6,38	-11,90
Estonia	40,32	2,54	Estonia	89,04	-7,89
Hungary	3,52	-14,02	Hungary	19,82	-25,26
Latvia	50,86	-6,94	Latvia	0,40	22,30
Lithuania	56,91	-12,51	Lithuania	-22,42	19,18
Poland	-1,15	-4,75	Poland	-20,82	15,70
Romania	8,19	-17,74	Romania	14,86	-12,97
Slovakia	31,77	-11,24	Slovakia	26,39	-24,91
Slovenia	-8,83	7,75	Slovenia	-25,22	19,49

(a) These results were obtained using the estimates from specification (A) of the model, considering bilateral common effects.

(b) A negative (positive) value means lower (higher) potential exports than actual ones by this percentage.

Table 5: Effects on Trade Creation and Trade Diversion

		1993				2000			
		Trade Diversion				Trade Diversion			
		Above Average		Below Average		Above Average		Below Average	
		EU	CEEC	EU	CEEC	EU	CEEC	EU	CEEC
Trade Creation	**Above Average**	Italy Germany Austria France Bel.-Lux. Spain Netherl. UK Sweden	Poland Czech R. Slowakia Hungary Slovenia			Italy Germany Austria France Spain UK Sweden	Poland Czech R. Slowakia Hungary Slovenia	Bel.-Lux.	
	Below Average	Portugal	Bulgaria	Ireland Greece Finland Denmark	Estonia Latvia Lithuania Romania	Portugal		Ireland Greece Finland Denmark Netherl.	Estonia Latvia Lithuania Romania Bulgaria

Source: See tables 8 and 9 in appendix.

Table 6: FDI in the CEEC

	global inflows (%GDP)						EU outflows (%GDP)			stock (% pop)
	1990-94		1995-99		1999	*Share*	1990-94	1995-99	1999	1999
Bulgaria	0.5	*1.6*	4.1	*2.9*	6.9	*4.2*	0.2	0.9	0.8	292.7
Czech R.	2.0	*10.2*	5.6	*21.8*	12.0	*33.1*	1.6	2.6	4.7	1707.4
Estonia	9.2	*3.1*	6.7	*2.1*	6.4	*1.6*	0.0	0.0	0.0	1749.9
Hungary	4.5	*42.8*	6.0	*18.5*	4.4	*10.4*	2.0	2.8	0.7	1908.3
Latvia	3.9	*1.9*	6.4	*2.5*	5.2	*1.8*	0.0	0.0	0.0	775.7
Lithuania	0.9	*0.4*	4.4	*2.8*	4.6	*2.5*	0.0	0.0	0.0	563.7
Poland	1.3	*30.9*	3.8	*38.1*	4.9	*38.1*	0.3	1.7	3.1	674.6
Romania	0.8	*3.7*	3.3	*7.1*	3.5	*5.5*	0.1	0.8	1.5	242.9
Slovakia	1.8	*3.1*	1.7	*2.4*	1.8	*1.9*	0.5	1.0	1.0	590.4
Slovenia	0.9	*2.3*	1.3	*1.7*	1.0	*0.9*	0.4	0.7	1.1	1335.0
Portugal	2.4		1.7		1.1					2855.9

Spain	2.3	1.7	2.7		2175.8

Source: International Financial Statistics, IMF, for CEEC inflows and stocks, and Eurostat for EU outflows (does not include reinvested earnings, for comparability reasons). Last column in millions USD.

Table 7: Determinants of FDI flows (1993-1999)
Random-Effects GLS Regression

Variable	***(1)***	***(2)***	***(3)***
	Coefficient *(Std. Err.)*	*Coefficient* *(Std. Err.)*	*Coefficient* *(Std. Err.)*
GDPcapi	0.875 (0.873)	0.634 (0.872)	1.023 (1.026)
GDPcapj	0.867* (0.162)	1.037* (0.170)	1.888* (0.374)
Popi	0.780* (0.150)	0.722* (0.150)	0.904* (0.169)
Popj	0.786* (0.149)	1.020* (0.165)	0.933* (0.178)
Openj	_	0.993* (0.316)	0.598 (0.400)
Clij	_	_	-0.785* (0.264)
Distj	-0.618* (0.199)	-0.448** (0.205)	-0.612* (0.221)
Frontier	0.598 (0.578)	0.686 (0.574)	0.428 (0.590)
Constant	-12.962 (8.914)	-13.426 (8.868)	-25.310** (11.073)
N	1933	1933	1221
Wald Test (all coeff. =0)	278.08*	289.84*	158.48*
Std. Deviation Residual	1.036	1.035	1.026

Hausman specif. test	8.45	10.08	10.30

All variables are in logs. Dependent variable is the logarithm of Foreign Direct Investment flows(FDI). Variables definition, countries used in regression and data sources can be seen in appendix.
Time dummies were also included but are not reported.
(*) and (**) denotes values significant at 1% and 5% respectively.

Table 8: Potential and Current FDI Flows

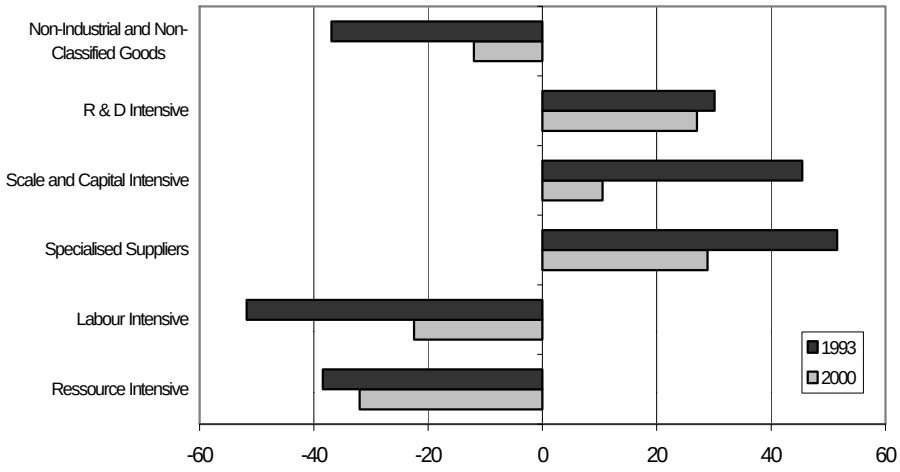
(Potential/Current)

	1996	**1997**	**1998**	**1999**
Czech Rep.	0.98	0.80	0.91	1.08
Hungary	0.59	0.96	0.70	2.52
Poland	0.49	0.92	-	-
Slovenia	-	-	0.56	1.02
Portugal	0.87	0.88	1.09	1.29
Spain	0.80	0.58	0.68	1.18

Source: Calculations use estimate values from specification (3) on table 7.

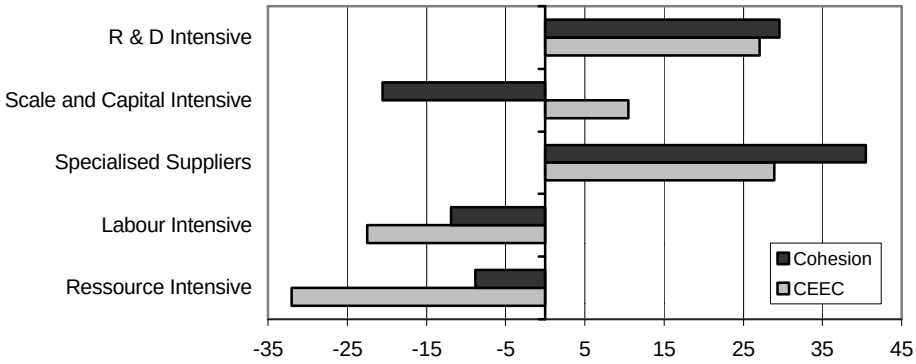
Figures

Figure 1: RCA by Factors of Production in EU-CEEC Trade



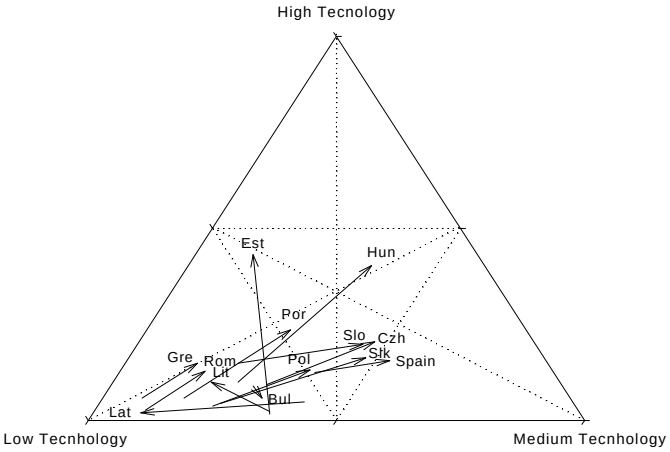
Source: Own calculations based on EUROSTAT database.

Figure 2: RCA by Factors of Production in 2000



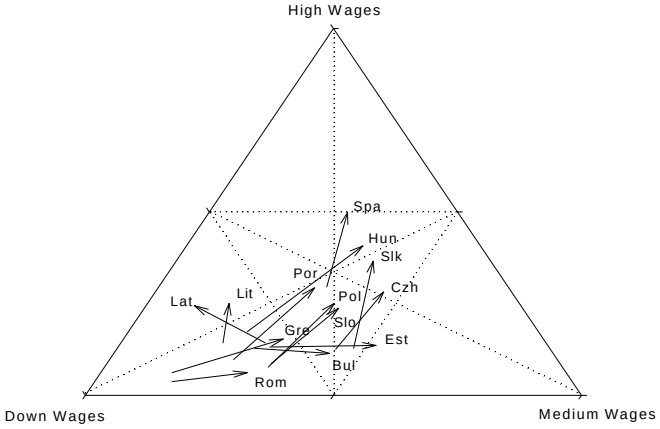
Source: Own calculations based on EUROSTAT Database.

Figure 3: CEEC Export to the EU by Technological Levels in 1993/2000



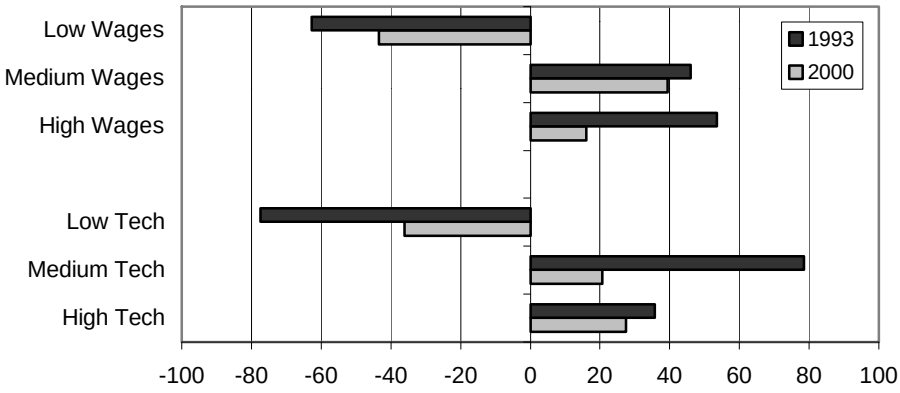
Source: Own calculations based on EUROSTAT database.

Figure 4: CEEC Exports to EU by Wage Levels in 1993/2000



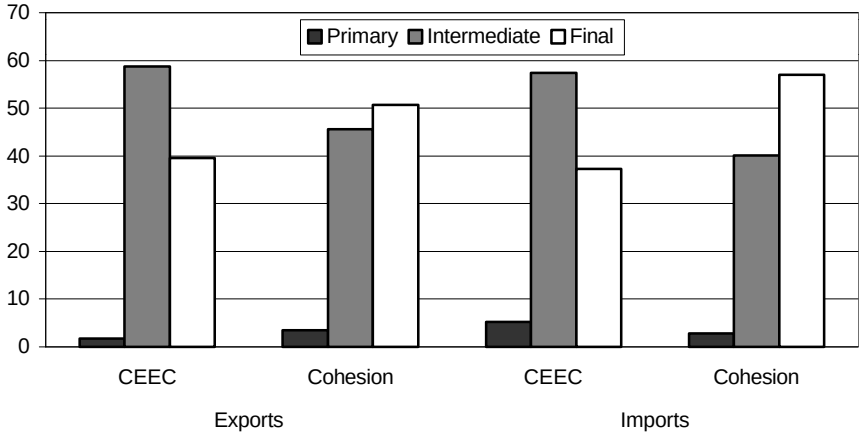
Source: Own calculations based on EUROSTAT database.

Figure 5: RCA by Technological and Wage Levels in EU-CEEC Trade



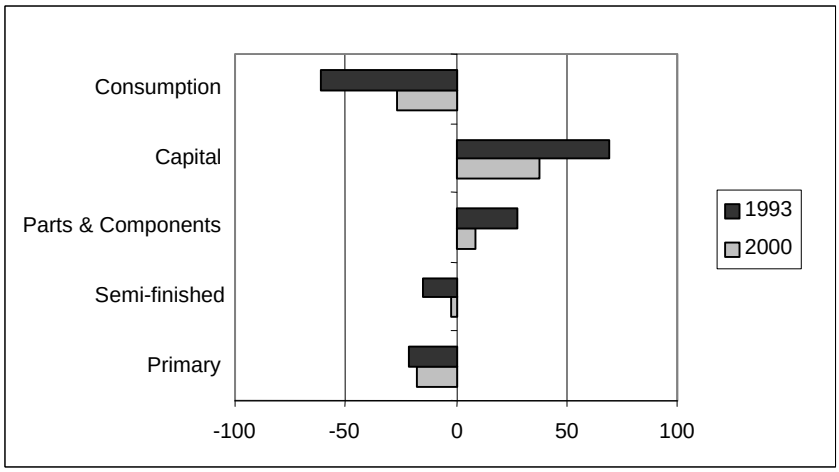
Source: Own calculations based on EUROSTAT database.

Figure 6: Primary, Intermediate and Final Goods In 2000 (% of Total Exports and Imports)



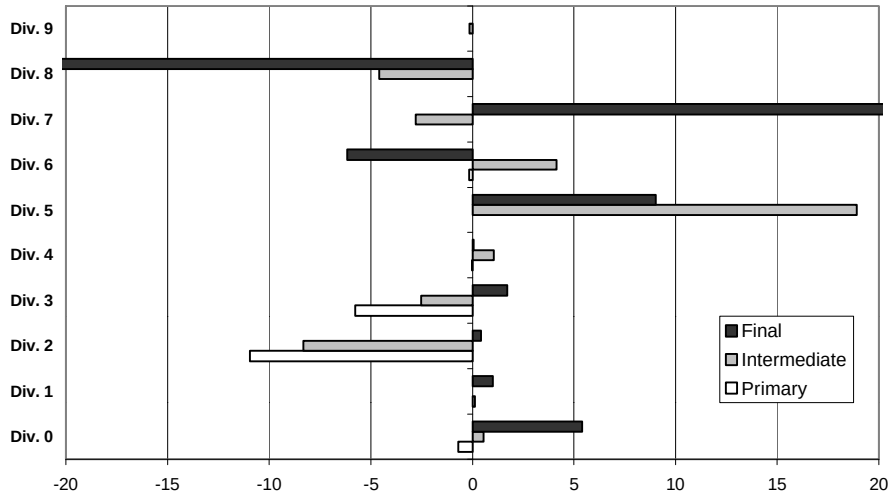
Source: Own calculations based on EUROSTAT database.

Figure 7: RCA by Stages of Production in EU-CEEC Trade



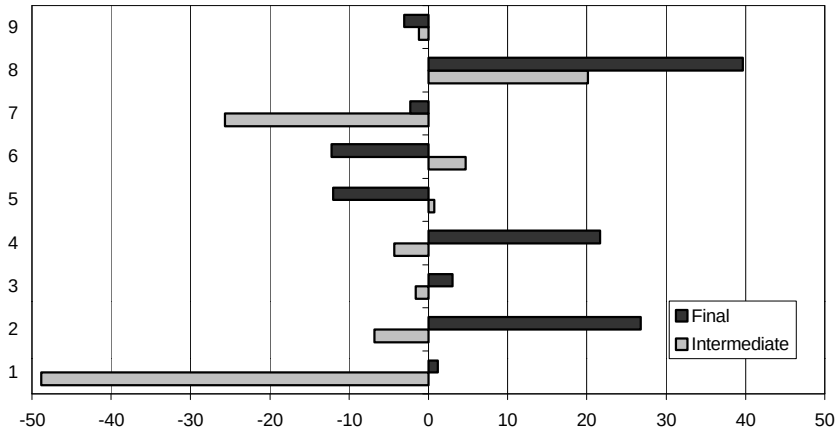
Source: Own calculations based on EUROSTAT database.

Figure 8: RCA by Stages of Production (STCI 1 Digit) in EU-CEEC Trade



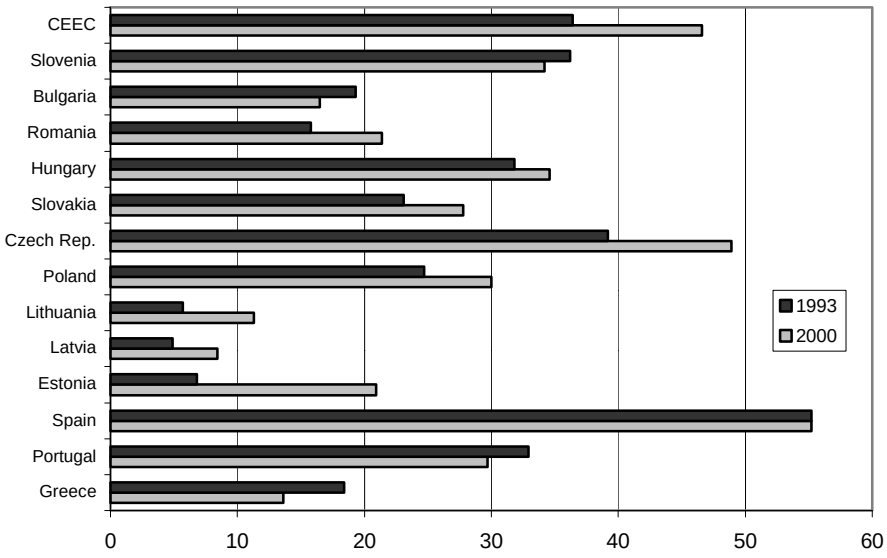
Source: Own calculations based on EUROSTAT database.

FIGURE 9: RCA by STCI Division 7 (2 Digits) in EU-CEEC Trade in 2000



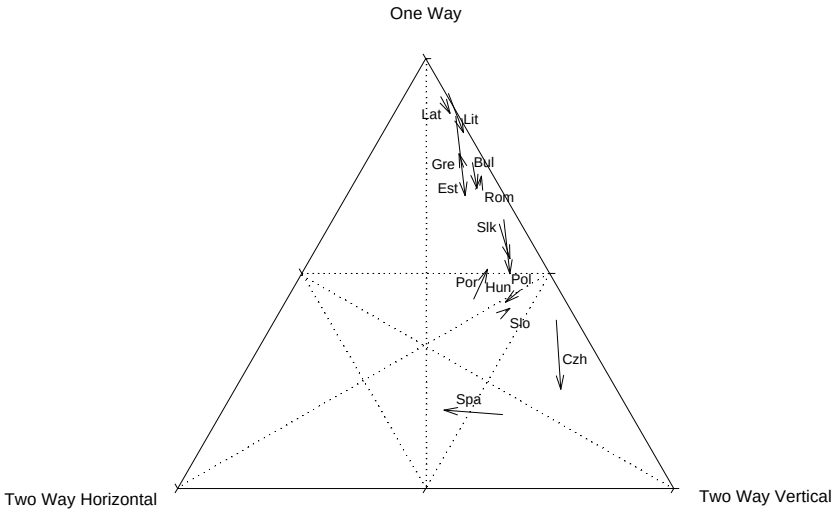
Source: Own calculations based on EUROSTAT database.

Figure 10: Intra-Industry Trade



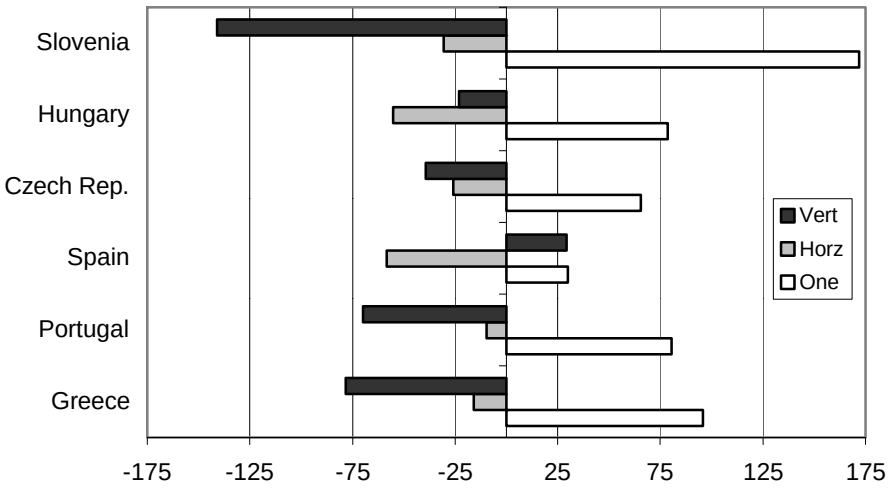
Source: Own calculations based on EUROSTAT database.

Figure 11: Share of Types Between CEEC-EU in 1993/2000



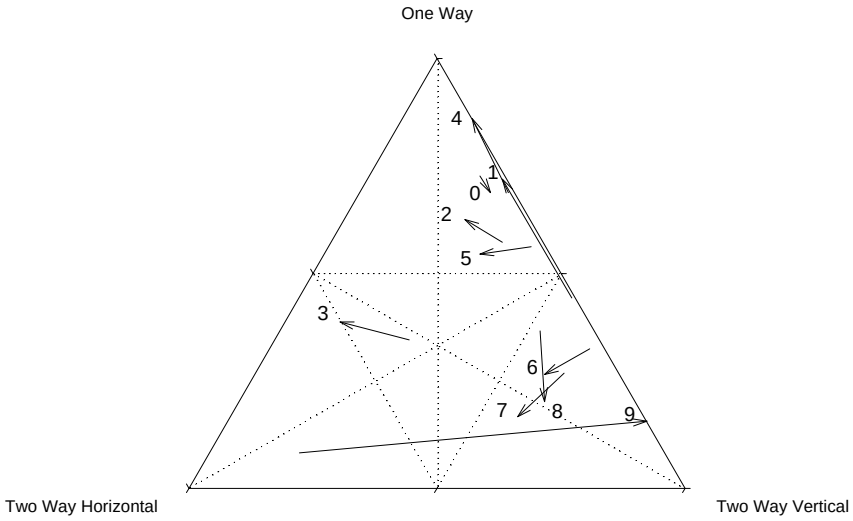
Source: Own calculations based on EUROSTAT database.

Figure 12: RCA by Trade Types in EU-CEEC in 2000



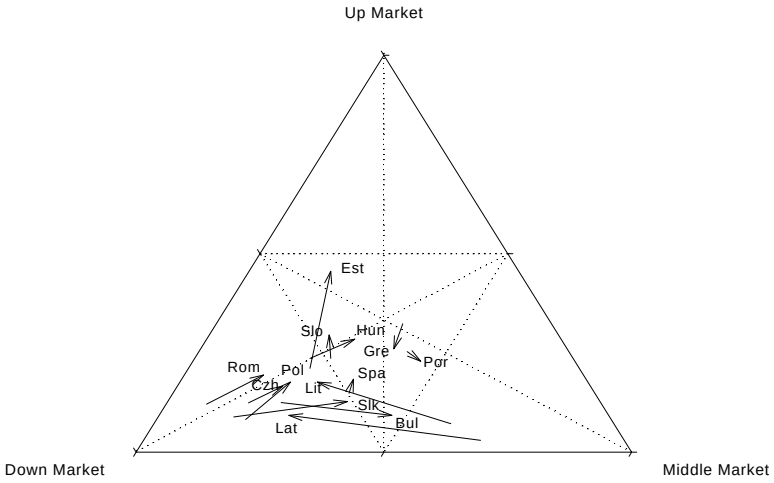
Source: Own calculations based on EUROSTAT database.

Figure 13: IIT by STCI Divisions in 1993/2000



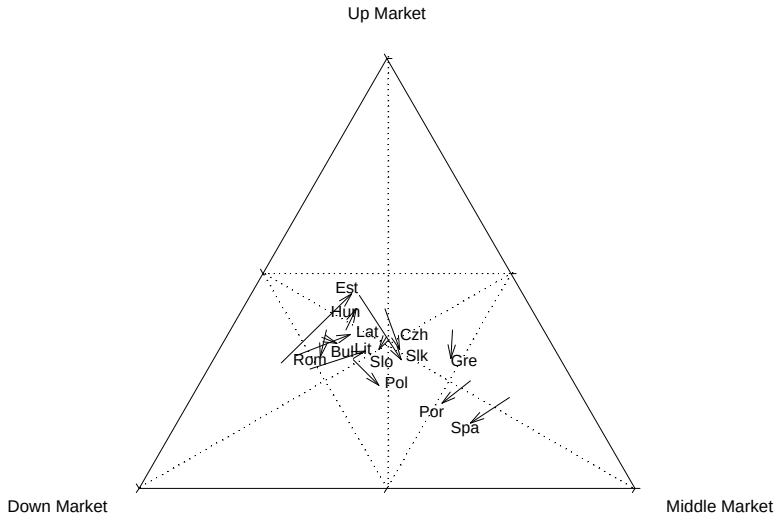
Source: Own calculations based on EUROSTAT database.

Figure 14: Price – Quality Ranges of Exports of the CEEC to the EU in 1993/2000



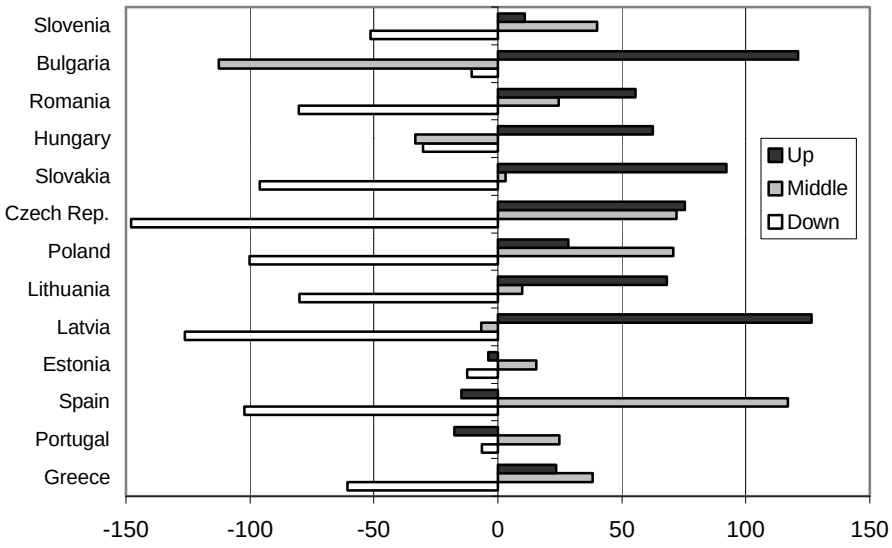
Source: Own calculations based on EUROSTAT database.

Figure 15: Price-Quality Ranges of Imports of CEEC from the EU in 2000



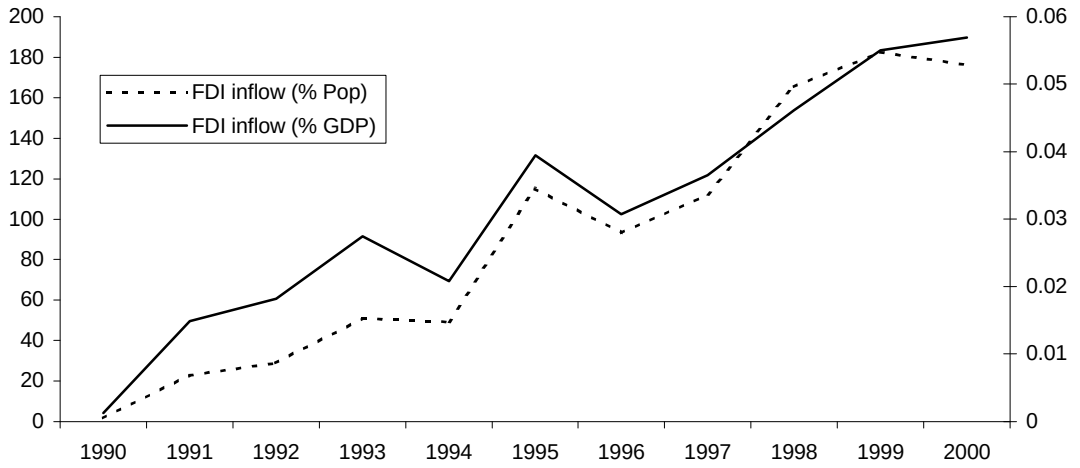
Source: Own calculations based on EUROSTAT database.

Figure 16: RCA by Price-Quality Ranges in EU-CEEC Trade in 2000



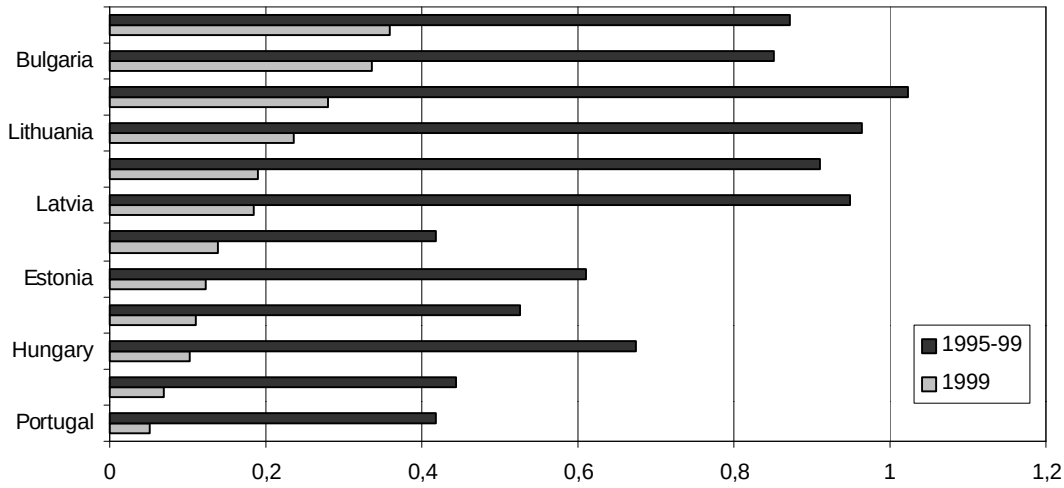
Source: Own calculations based on EUROSTAT database.

Figure 17: Global FDI inflows in the CEEC, 1990/2000 (% GDP and population)



Source: Own calculations based on International Financial Statistics, IMF.

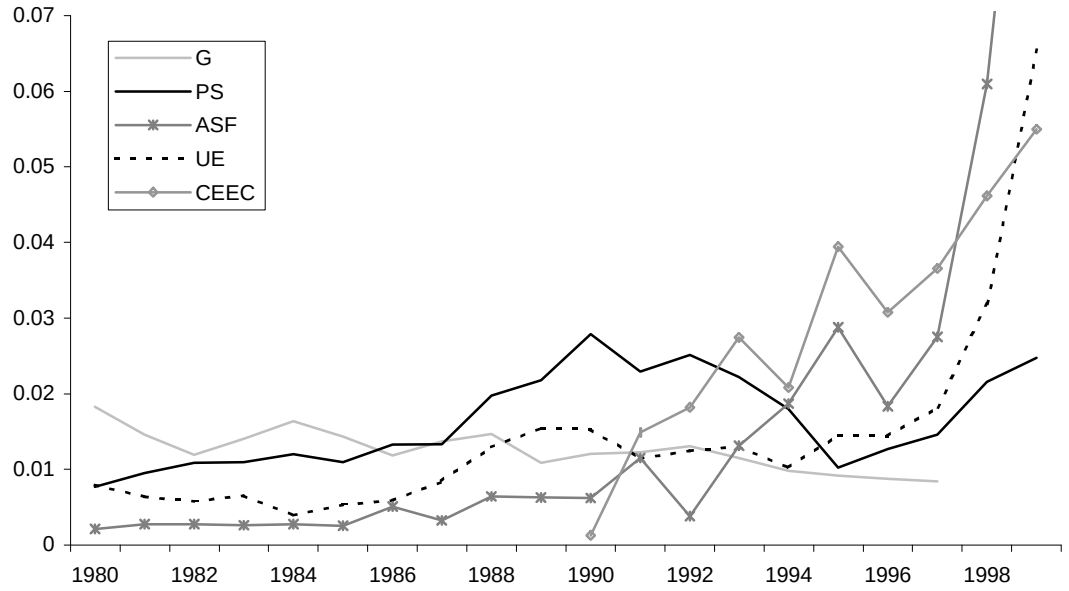
Figure 18: Ratio of FDI flows to stocks, 1995-99 and 1999



Note: The value above unity reminds that FDI stocks do not equal accumulated flows due to price and exchange rate changes and other adjustments such as changes between portfolio and direct investment (when capital participation rises above 10%).

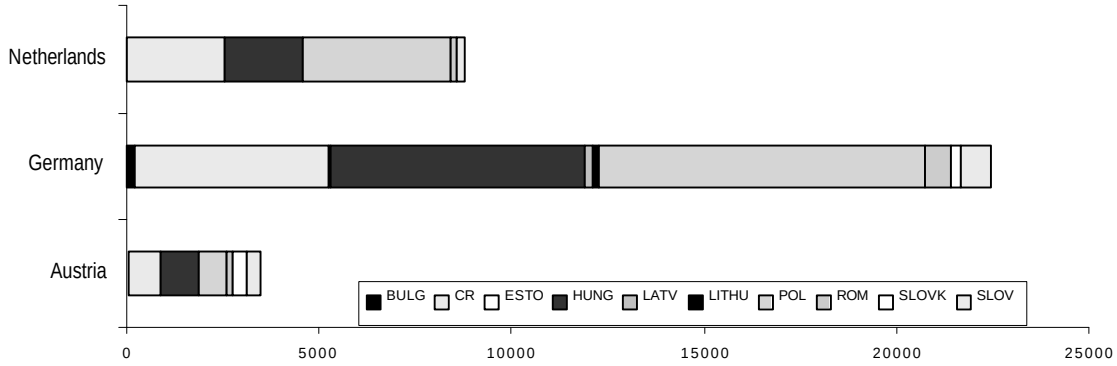
Source: Own calculations based on International Financial Statistics, IMF.

Figure 19: FDI inflows in the EU across four enlargement periods, 1980-2000 (% GDP)



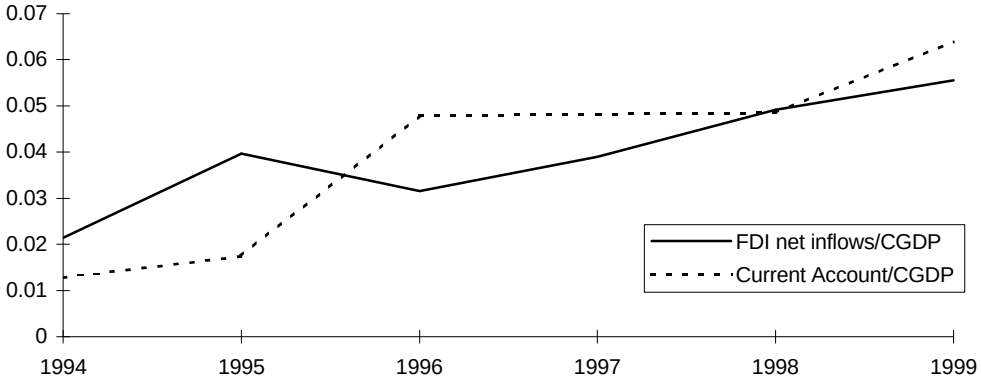
Source: Own calculations based on International Financial Statistics, IMF.
To facilitate comparisons, the value for 1999 in the group of Austria, Sweden and Finland (12.2%) is out of sight.

Figure 20: FDI inflows from the three main investors (millions USD)



Source: Own calculations based on EUROSTAT database.

Figure 21: Net capital inflows and the current account in the CEEC, 1990-99 (%GDP)



Source: Own calculations based on International Financial Statistics, IMF.

A P P E N D I X

A. Tables

Table 1: Relative Intensity of Export Index

	CEEC			UE	
	1993	**1999**		**1993**	**1999**
France	0,73	0,94	Slovenia	1,64	1,72
Benelux	0,60	0,91	Estonia	1,33	1,68
Germany	2,40	2,91	Latvia	1,48	1,67
Italy	1,63	1,81	Lithuania	0,92	1,42
Netherlands	0,77	0,94	Bulgaria	0,86	1,33
United Kingdom	0,65	0,71	Czech Republic	1,33	1,76
Ireland	0,21	0,41	Slovakia	0,84	1,57
Denmark	1,14	1,36	Hungary	1,54	1,89
Finland	2,23	3,98	Poland	1,77	1,81
Sweden	1,10	1,72	Romania	1,07	1,68
Austria	5,12	4,07			
Spain	0,51	0,75			
Greece	3,24	3,31			
Portugal	0,12	0,37			
European Union	**1,41**	**1,66**	**CEEC**	**1,39**	**1,75**

Source: Own calculations based on CHELEM database - CEPII.

Table 2: Trade Flows with CEEC (% of Total)

	1993		2000	
	Exp.	**Imp.**	**Exp.**	**Imp.**
Germany	4,6	4,5	8,4	9,0
Austria	0,0	0,0	12,3	11,6
Bel.-Lux.	1,1	0,7	2,2	2,0
Denmark	2,2	2,5	3,2	3,7
Spain	1,0	0,6	2,6	1,3
Finland	0,0	0,0	7,4	5,1
France	1,4	1,1	2,7	1,9
Greece	6,5	2,1	10,6	4,3
Holand	1,7	1,6	2,3	2,1
Ireland	0,4	0,4	1,5	1,2
Italy	3,2	2,5	5,6	4,4
Portugal	0,2	0,3	1,2	1,4
U.K.	1,2	0,9	2,0	1,6
Sweden	0,0	0,0	4,2	4,4
U.E.	**2,5**	**2,1**	**4,1**	**3,1**

Source: Own calculations based on Eurostat database.

Table 3: Hierarchy of Relative Intensity of Export Index

Order	1993			Order	1999		
1	Finland	Estonia	49,80	1	Greece	Bulgaria	41,70
2	Estonia	Finland	32,09	2	Finland	Estonia	40,03
3	Greece	Bulgaria	27,30	3	Estonia	Finland	27,00
4	Austria	Hungary	10,02	4	Estonia	Sweden	15,25
5	Estonia	Sweden	9,67	5	Bulgaria	Greece	14,66
6	Bulgaria	Greece	8,83	6	Latvia	Sweden	12,00
7	Austria	Slovenia	8,73	7	Greece	Romania	11,27
8	Sweden	Estonia	7,57	8	Austria	Slovenia	9,91
9	Hungary	Austria	7,11	9	Finland	Latvia	9,66
10	Latvia	Denmark	6,59	10	Austria	Hungary	8,07
643	Portugal	Slovakia	0,05	643	Slovakia	Portugal	0,12
644	Portugal	Poland	0,04	644	Slovakia	Ireland	0,12
645	Lithuania	Ireland	0,04	645	Portugal	Slovakia	0,11
646	Portugal	Latvia	0,02	646	Latvia	Portugal	0,11
647	Estonia	Ireland	0,02	647	Latvia	Greece	0,11
648	Latvia	Greece	0,02	648	Slovenia	Ireland	0,09
649	Slovakia	U.K.	0,01	649	Lithuania	Portugal	0,08
650	Slovakia	Ireland	0,01	650	Portugal	Slovenia	0,08
651	Portugal	Lithuania	0,01	651	Lithuania	Greece	0,08
652	Ireland	Slovakia	0,00	652	Estonia	Greece	0,08

Source: Own calculations based on CHELEM database - CEPII.

Table 4: Trade Flows with the EU (% of Total)

	1993		2000		Variation	
	Exp.	Imp.	Exp.	Imp.	Exp.	Imp.
Estonia	0,73	0,77	3,30	2,89	2,6	2,1
Latvia	1,43	1,13	1,95	1,81	0,5	0,7
Lithuania	1,53	1,66	2,23	2,29	0,7	0,6
Baltics	3,69	3,56	7,49	6,99	3,8	3,4
Poland	32,76	34,07	23,54	29,69	-9,2	-4,4
Czech R.	18,52	19,62	21,98	21,18	3,5	1,6
Slovakia	4,89	4,02	7,07	5,88	2,2	1,9
Hungary	16,51	16,35	22,48	18,70	6,0	2,4
Slovenia	11,46	9,58	6,48	7,25	-5,0	-2,3
Ceec-5	84,15	83,64	81,55	82,70	-2,6	-0,9
Romania	7,99	8,12	7,78	7,45	-0,2	-0,7
Bulgaria	4,17	4,67	3,19	2,86	-1,0	-1,8
Balcanics	12,16	12,79	10,96	10,31	-1,2	-2,5
CEEC	100	100	100	100	0,0	0,0

Source: Own calculations based on Eurostat database.

Table 5: Trade Flows with CEEC (% of Total)

	1993		2000	
	Exp.	**Imp.**	**Exp.**	**Imp.**
Germany	52,1	56,2	42,7	47,5
Austria	0,0	0,0	7,7	8,8
Bel.-Lux.	3,9	3,0	4,1	3,9
Denmark	2,3	2,6	1,5	1,8
Spain	1,9	1,6	2,7	2,1
Finland	0,0	0,0	3,3	1,8
France	9,2	8,4	8,6	6,8
Greece	1,6	1,7	1,1	1,3
Holand	6,3	6,5	5,1	4,8
Ireland	0,4	0,3	1,1	0,6
Italy	15,9	12,9	12,8	10,8
Portugal	0,1	0,2	0,3	0,6
U.K.	6,4	6,6	5,6	6,0
Sweden	0,0	0,0	3,5	3,3
Total	**100**	**100**	**100**	**100**

Source: Own calculations based on Eurostat database.

TABLE 6: Potential and Current EU Exports, 1999

Potential / Current Percentage Deviation

	Austria		Bel-Lux		Denmark		Finland		France		Germany		Greece	
Destiny / Origin	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Bulgaria	-17,42	-6,16	-6,31	4,22	4,11	11,82	-7,67	-4,93	-25,65	-18,32	4,08	18,02	6,57	11,50
Czech Repub.	2,35	11,95	-7,14	-0,52	15,38	19,35	16,68	16,35	-16,05	-11,17	-13,01	-5,04	20,94	21,91
Estonia	-34,84	.	-11,41	.	-1,90	.	11,62	.	-28,53	.	-5,90	.	-5,72	.
Hungary	17,59	22,51	-37,39	-35,92	8,53	6,77	9,74	4,20	-20,78	-19,11	-26,25	-22,27	37,49	30,73
Latvia	-40,47	.	-11,98	.	-19,35	.	6,60	.	-39,48	.	-4,11	.	-41,05	.
Lithuania	-44,45	.	-31,57	.	-31,73	.	3,66	.	-17,04	.	-5,37	.	9,24	.
Poland	6,40	10,33	-13,08	-11,13	19,54	17,00	21,76	15,90	-23,23	-20,57	-10,15	-3,97	39,54	32,53
Romania	-28,81	-19,99	-29,84	-23,06	-4,78	1,52	5,48	8,83	-9,75	-3,60	-12,62	-3,80	-17,14	-12,92
Slovakia	13,64	16,50	-19,23	-18,71	18,48	14,57	12,88	4,62	-13,30	-13,06	-19,10	-16,23	63,43	52,59
Slovenia	2,17	.	-1,02	.	-1,16	.	13,29	.	4,33	.	6,24	.	4,14	.

	Ireland		Italy		Netherlands		Portugal		Spain		Sweden		***UK***	
Destiny / Origin	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Bulgaria	-29,82	.	-10,20	-1,07	2,66	7,47	7,05	13,36	-48,94	-47,72	-11,68	-5,90	56,61	53,59
Czech Repub.	-14,40	.	3,32	9,56	-0,03	0,92	-32,51	-31,10	-6,21	-7,44	-13,79	-11,52	8,58	2,55
Estonia	55,05	.	-22,50	.	5,92	.	-14,32	.	-21,44	.	-7,82	.	-4,96	.
Hungary	-22,53	.	-4,63	-2,47	5,58	2,25	-33,76	-36,35	-15,30	-19,56	17,56	15,35	6,42	-3,07
Latvia	17,58	.	-34,29	.	-3,42	.	-51,06	.	-39,20	.	9,53	.	7,31	.
Lithuania	32,05	.	-22,32	.	21,05	.	9,77	.	-44,78	.	-10,21	.	-13,55	.
Poland	-1,27	.	-2,60	0,76	6,92	4,15	-56,66	-57,43	-9,38	-13,07	-11,70	-13,35	36,99	26,34
Romania	-25,61	.	-24,62	-19,29	-14,39	-11,92	-22,21	-16,90	2,97	3,07	-38,50	-35,42	-0,29	-4,87
Slovakia	-42,79	.	-1,23	-0,72	2,80	-2,30	65,69	56,06	-30,07	-34,80	-27,07	-29,66	-10,21	-19,66
Slovenia	-15,29	.	20,23	.	9,85	.	58,81	.	-12,84	.	-26,83	.	18,87	.

* Calculations based on specifications A and B of the Model, considering bilateral common effects

TABLE 7 : Potential and Current EU Imports, 1999
Potential / Current Percentage Deviation

	Austria		Bel-Lux		Denmark		Finland		France		Germany		Greece	
Origin / Destiny	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Bulgaria	25,33	9,25	-45,75	-52,50	6,47	-4,05	58,81	28,95	8,63	-4,74	25,10	13,74	34,37	23,35
Czech Repub.	4,54	-5,72	-12,35	-20,56	2,58	-4,30	-13,19	-26,64	-27,71	-34,39	-13,47	-18,58	40,31	33,38
Estonia	-36,84	.	3,00	.	-16,61	.	6,88	.	-11,69	.	20,68	.	5,15	.
Hungary	8,18	-1,40	-38,83	-43,80	-7,68	-13,10	4,30	-10,94	-36,43	-40,92	-30,41	-32,92	26,84	20,67
Latvia	-39,14	.	52,32	.	-12,29	.	58,58	.	64,65	.	23,57	.	-28,96	.
Lithuania	-26,01	.	14,65	.	-9,56	.	37,26	.	-19,22	.	11,53	.	122,44	.
Poland	34,37	17,28	6,08	-6,34	29,94	17,08	114,37	76,54	13,18	2,56	12,47	5,76	21,19	10,81
Romania	-20,94	-27,06	-17,22	-23,53	0,21	-4,06	1,48	-11,66	-8,03	-16,09	-4,41	-9,69	-18,05	-19,14
Slovakia	-10,07	-16,38	-28,16	-32,71	-2,27	-6,23	-8,26	-20,73	-45,25	-48,19	-23,86	-25,25	47,23	42,60
Slovenia	15,89	.	10,53	.	-18,06	.	48,92	.	42,75	.	16,68	.	41,34	.

	Ireland		Italy		Netherlands		Portugal		Spain		Sweden		UK	
Origin / Destiny	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Bulgaria	-17,99	.	-0,94	-4,59	37,76	19,44	0,47	-10,22	10,19	-2,47	7,19	-3,18	70,10	67,79
Czech Repub.	0,82	.	8,13	7,74	-12,10	-21,02	-54,62	-57,98	-37,76	-42,94	-17,97	-23,28	-11,74	-9,89
Estonia	-45,12	.	-23,13	.	4,43	.	-2,63	.	-44,37	.	-23,28	.	-19,97	.
Hungary	-69,19	.	-4,09	-2,21	-40,60	-45,67	-65,37	-67,98	-16,15	-21,49	-2,04	-7,07	-28,84	-25,65
Latvia	5,35	.	-16,01	.	94,16	.	67,73	.	-37,21	.	6,47	.	11,42	.
Lithuania	-2,25	.	9,45	.	109,62	.	342,46	.	57,19	.	0,15	.	55,17	.
Poland	76,38	.	-0,08	-0,85	26,07	11,58	15,16	4,75	2,21	-7,02	16,71	6,52	27,05	29,31
Romania	13,58	.	-23,56	-23,42	-4,14	-12,59	-54,64	-56,24	0,10	-7,32	11,24	5,98	-10,60	-8,19
Slovakia	6,48	.	-35,12	-32,58	-10,36	-16,58	21,34	14,04	-24,10	-27,68	7,67	4,09	-45,83	-42,36
Slovenia	106,49	.	14,39	.	42,00	.	36,77	.	-12,49	.	39,52	.	19,71	.

Calculations based on specifications A and B of the Model, considering bilateral common effects

Table 8: Trade Creation Index

	Trade Creation			Trade Creation	
	1993	2000		1993	2000
Estonia	0,10	0,20	France	0,52	0,53
Latvia	0,09	0,11	Netherlands	0,44	0,43
Lithuania	0,10	0,14	Germany	0,61	0,64
Poland	0,30	0,33	Italy	0,54	0,59
Czech Rep.	0,38	0,39	U.K.	0,51	0,52
Slowakia	0,26	0,27	Ireland	0,29	0,30
Hungary	0,32	0,34	Denmark	0,38	0,43
Romania	0,19	0,21	Greece	0,17	0,19
Bulgaria	0,22	0,18	Portugal	0,30	0,31
Slovenia	0,36	0,30	Spain	0,45	0,47
			Bel/Lux	0,49	0,47
			Sweden	0,42	0,47
			Finland	0,25	0,28
			Austria	0,44	0,52
CEEC	**0,23**	**0,25**	**UE**	**0,41**	**0,44**

Table 9: Trade Divertion Index

	Trade Divertion			Trade Divertion	
	1993	2000		1993	2000
Estonia	0,11	0,17	France	0,38	0,39
Latvia	0,09	0,10	Netherlands	0,34	0,32
Lithuania	0,10	0,13	Germany	0,39	0,44
Poland	0,25	0,27	Italy	0,42	0,42
Czech Rep.	0,31	0,29	U.K.	0,34	0,36
Slowakia	0,23	0,24	Ireland	0,19	0,17
Hungary	0,27	0,28	Denmark	0,30	0,35
Romania	0,18	0,19	Greece	0,22	0,21
Bulgaria	0,20	0,16	Portugal	0,40	0,38
Slovenia	0,29	0,24	Spain	0,35	0,37
			Bel/Lux	0,36	0,34
			Sweden	0,34	0,41
			Finland	0,22	0,27
			Austria	0,39	0,46
CEEC	**0,20**	**0,21**	**UE**	**0,33**	**0,35**

Source: Own calculations based on Eurostat database.

Table 10: EU' Trade with CEECs by Factors of Production (% of Total)

	Ressource		Labour		Spec. Sup.		Scale and Cap.		R&D		Non-Ind.	
Exports	**1993**	**2000**	**1993**	**2000**	**1993**	**2000**	**1993**	**2000**	**1993**	**2000**	**1993**	**2000**
Poland	13,9	9,3	26,2	17,1	15,5	25,0	25,8	35,1	8,2	10,1	10,4	3,4
Hungary	12,0	5,8	30,4	15,3	18,0	33,6	25,7	31,1	9,8	12,6	4,1	1,6
Slowakia	11,4	7,5	28,1	15,7	24,9	25,9	18,7	38,5	9,5	9,4	7,3	2,9
Slovenia	13,8	15,6	31,8	18,0	15,4	21,5	30,0	34,4	5,4	7,4	3,5	3
Czech R.	12,8	9,6	24,8	15,5	24,6	31,4	24,0	32,0	9,2	9,4	4,6	2,2
Bulgaria	22,3	11,5	27,1	30,0	15,6	19,7	22,1	23,6	7,8	11,5	5,2	3,7
Romania	9,6	7,0	34,8	35,8	19,3	25,9	19,7	19,7	4,0	9,2	12,5	2,3
Lithuania	32,8	10,8	18,1	23,2	12,1	22,5	16,2	26,7	4,1	9,8	16,6	6,9
Latvia	36,8	15,4	18,0	19,6	14,1	21,2	13,2	28,1	3,8	11,6	14,2	4,1
Estonia	44,2	12,2	14,5	16,1	8,3	38,6	16,1	23,0	5,3	7,4	11,7	2,8
CEEC	**14,1**	**9,2**	**27,6**	**18,3**	**18,2**	**27,9**	**24,5**	**31,7**	**8,0**	**10,1**	**7,5**	**2,7**
Imports												
Poland	26,3	21,6	35,4	22,7	4,1	15,9	13,1	32,1	1,1	1,1	19,9	6,5
Hungary	19,5	8,3	37,9	13,5	10,6	29,9	16,7	31,7	2,1	13,1	13,1	3,4
Slowakia	19,8	13,1	33,5	18,7	6,7	21,8	28,2	41,2	1,4	2,8	10,5	2,5
Slovenia	11,5	12,2	48,1	25,4	14,0	22,1	18,5	33,7	4,6	4,0	3,3	2,6
Czech R.	19,2	10,1	33,7	20,5	11,7	26,9	19,3	34,9	1,8	3,2	14,4	4,5
Bulgaria	26,9	28,4	36,1	37,4	7,8	6,9	10,9	19,4	4,3	2,3	13,9	5,6
Romania	27,5	15,0	57,0	53,1	3,8	13,8	6,0	12,3	1,3	1,8	4,4	4
Lithuania	27,1	28,4	23,8	32,8	1,9	8,6	12,3	14,5	0,3	1,3	34,4	14,3
Latvia	17,1	59,2	13,2	17,8	2,0	2,4	6,0	3,8	0,1	0,7	61,7	16,1
Estonia	20,8	25,3	20,3	17,4	0,8	38,8	10,1	5,6	0,6	1,4	47,4	11,5
CEEC	**21,8**	**15,6**	**38,0**	**22,8**	**7,9**	**22,2**	**15,4**	**29,6**	**2,0**	**4,7**	**14,9**	**5,1**

Source: Own calculations based on Eurostat database.

Table 11: RCA of EU' Trade with CEEC by Factors of Production

	Ressource		Labour		Spec. Sup.		Scale and Cap.		R&D		Non-Ind.	
	1993	**2000**	**1993**	**2000**	**1993**	**2000**	**1993**	**2000**	**1993**	**2000**	**1993**	**2000**
Poland	-62,1	-60,1	-46,3	-27,3	56,0	44,0	63,8	14,8	35,7	43,7	-47,2	-15,2
Hungary	-37,5	-12,5	-37,2	8,8	36,8	18,8	44,0	-3,0	38,2	-2,8	-45,2	-9,2
Slowakia	-41,6	-27,6	-26,8	-14,8	91,8	20,8	-47,4	-13,4	39,9	32,9	-15,9	2,1
Slovenia	11,7	16,7	-81,5	-36,5	7,1	-2,9	57,6	3,6	4,1	17,1	1	2
Czech R.	-31,5	-2,5	-43,9	-24,9	63,4	22,4	23,5	-14,5	37,2	31,2	-48,7	-11,7
Bulgaria	-22,3	-84,3	-45,0	-37,0	38,2	64,2	54,6	20,6	17,0	46,0	-42,5	-9,5
Romania	-88,8	-39,8	-110,5	-86,5	76,8	60,8	68,1	37,1	13,8	36,8	40,5	-8,5
Lithuania	27,5	-87,5	-27,6	-47,6	50,4	69,4	18,5	60,5	18,3	42,3	-88,1	-37,1
Latvia	98,3	-218,7	24,2	9,2	60,0	94,0	36,4	121,4	18,2	54,2	-237,2	-60,2
Estonia	116,2	-65,8	-29,9	-6,9	37,1	-0,9	30,0	87,0	23,0	30,0	-177,4	-43,4
CEEC	**-38,0**	**-32,0**	**-51,5**	**-22,5**	**51,9**	**28,9**	**45,5**	**10,5**	**30,1**	**27,1**	**-37**	**-12**
Cohesion	**-31,8**	**-8,8**	**-34,9**	**-11,9**	**30,5**	**40,5**	**14,5**	**-20,5**	**17,5**	**29,5**	**5,2**	**-28,8**

Source: Own calculations based on Eurostat database.

Table 12: RCA of EU' Trade with CEEC by Tecnhology Levels

	High		Medium		Low	
	1993	2000	1993	2000	1993	2000
Poland	46,0	48,0	79,4	34,4	-78,2	-67,2
Hungary	37,1	-16,9	71,1	15,1	-63,0	11,0
Slowakia	55,8	41,8	84,1	5,1	-125,0	-49,0
Slovenia	-20,2	-2,2	90,3	-16,7	-71,2	16,8
Czech R.	51,0	43,0	68,9	-20,1	-71,2	-11,2
Bulgaria	30,4	77,4	53,8	8,8	-41,8	-76,8
Romania	24,0	62,0	136,0	67,0	-200,5	-120,5
Lithuania	27,3	70,3	6,2	82,2	54,5	-115,5
Latvia	24,8	97,8	42,8	142,8	169,6	-180,4
Estonia	31,8	0,8	9,9	83,9	135,6	-41,4
CEEC	**35,5**	**27,5**	**78,7**	**20,7**	**-77,2**	**-36,2**
Cohesion	**24,2**	**43,2**	**42,7**	**4,7**	**-73,2**	**-19,2**

Source: Own calculations based on Eurostat database.

Table 13: RCA of EU' Trade with CEEC by Wage Levels

	High		Medium		Low	
	1993	2000	1993	2000	1993	2000
Poland	73,9	40,9	42,8	42,8	-69,5	-68,5
Hungary	39,0	-40,0	80,8	64,8	-74,6	-15,6
Slowakia	25,4	4,4	2,5	0,5	-12,0	-7,0
Slovenia	70,1	49,1	25,5	13,5	-96,6	-64,6
Czech R.	36,4	3,4	45,1	26,1	-32,8	-17,8
Bulgaria	43,9	74,9	13,0	-32,0	-14,4	-33,4
Romania	53,2	75,2	65,5	41,5	-158,2	-108,2
Lithuania	13,6	11,6	34,6	96,6	39,9	-71,1
Latvia	34,8	35,8	55,2	153,2	147,1	-128,9
Estonia	33,4	37,4	18,8	25,8	124,2	-19,8
CEEC	**53**	**16**	**46,3**	**39,3**	**-62,4**	**-43,4**
Cohesion	**21,8**	**3,8**	**25,1**	**40,1**	**-52,2**	**-15,2**

Source: Own calculations based on Eurostat database.

Table 14: EU' Trade with CEEC by Stages of Production (% of Total)

	Primary		Semi-Finished		Parts & Comp.		Capital		Consumption	
Exports	**1993**	**2000**	**1993**	**2000**	**1993**	**2000**	**1993**	**2000**	**1993**	**2000**
Poland	6,4	2,1	34,9	40,4	12,1	16,0	19,8	22,2	26,6	19,4
Hungary	2,1	1,1	34,4	29,6	15,1	33,3	18,8	18,1	29,5	17,8
Slowakia	2,8	1,9	33,3	36,6	17,7	32,0	24,0	18,5	22,2	11,0
Slovenia	1,5	2,2	38,6	40,1	16,7	14,4	14,6	17,3	28,7	25,9
Czech R.	2,0	1,2	29,9	37,1	16,9	23,1	26,4	23,4	24,6	15,2
Bulgaria	2,3	2,9	29,8	42,0	9,5	11,0	17,3	22,4	40,7	21,6
Romania	8,9	1,2	37,0	42,8	9,3	16,2	25,7	22,7	18,8	16,9
Lithuania	8,4	5,9	20,5	37,8	7,2	10,4	17,0	22,9	46,5	22,9
Latvia	6,6	1,7	16,5	35,6	7,0	9,5	17,8	27,0	51,8	26,2
Estonia	7,4	2,1	21,2	32,1	5,9	23,9	13,7	22,3	51,6	19,6
CEEC	**4,2**	**1,7**	**33,6**	**37,2**	**13,8**	**21,5**	**20,9**	**21,2**	**27,5**	**18,3**
Imports										
Poland	11,6	6,8	34,8	39,5	5,7	18,7	6,3	6,7	41,6	28,2
Hungary	8,3	3,0	30,2	26,8	12,2	27,2	5,9	24,6	43,3	18,4
Slowakia	5,3	2,5	52,1	48,9	6,1	18,3	7,0	9,6	29,5	20,7
Slovenia	2,0	1,3	29,3	46,1	12,2	17,3	10,0	12,1	46,4	23,1
Czech R.	7,0	4,1	42,1	41,7	11,2	25,9	9,7	14,3	29,9	13,9
Bulgaria	9,4	4,7	36,7	51,3	4,5	4,4	6,1	4,4	43,2	35,2
Romania	3,0	4,6	20,2	24,1	3,9	10,2	4,1	6,6	68,8	54,4
Lithuania	13,0	17,5	71,3	47,8	0,2	2,1	0,7	2,0	14,8	30,2
Latvia	22,9	18,7	67,8	66,8	0,2	0,7	0,6	1,7	8,4	12,1
Estonia	26,0	14,1	53,3	29,2	0,4	5,8	1,8	34,1	18,4	16,8
CEEC	**8,5**	**5,3**	**36,7**	**37,6**	**8,1**	**19,8**	**6,9**	**13,6**	**39,8**	**23,6**

Source: Own calculations based on Eurostat database.

Table 15: RCA of EU' Trade with CEEC by Stages of Production

	Primary		Semi-Finished		Parts & Comp.		Capital		Consumption	
	1993	**2000**	**1993**	**2000**	**1993**	**2000**	**1993**	**2000**	**1993**	**2000**
Poland	-25,4	-22,3	0,7	4,2	31,3	-13,0	66,6	72,7	-73,8	-41,2
Hungary	-30,8	-9,3	21,0	14,1	14,5	30,4	63,6	-32,2	-68,4	-2,9
Slowakia	-12,7	-3,4	-94,0	-61,7	57,9	68,4	85,0	44,6	-36,6	-47,9
Slovenia	-2,7	4,3	46,2	-28,4	22,4	-14,0	22,7	25,1	-88,4	13,3
Czech R.	-24,8	-14,4	-60,4	-22,3	28,5	-14,1	82,8	45,1	-26,3	6,2
Bulgaria	-34,6	-9,1	-33,6	-46,3	24,2	33,1	54,6	90,1	-12,2	-68,1
Romania	28,8	-17,0	82,2	92,9	26,4	29,7	105,5	79,9	-244,7	-186,4
Lithuania	-22,0	-56,6	-245,9	-49,0	33,6	40,6	79,0	102,0	153,6	-35,5
Latvia	-71,9	-85,0	-224,9	-155,7	29,9	43,7	75,1	126,3	190,2	70,4
Estonia	-93,2	-59,8	-160,3	14,4	27,0	90,4	59,4	-58,8	165,7	13,8
CEEC	**-21,3**	**-17,4**	**-15,3**	**-1,9**	**28,0**	**8,3**	**69,2**	**37,4**	**-61,2**	**-26,3**
Cohesion	**7,4**	**3,3**	**15,7**	**6,5**	**21,6**	**19,0**	**35,6**	**59,0**	**-80,6**	**-88,3**

Source: Own calculations based on Eurostat database.

Table 16: EU' Trade with CEEC by STCI Divisions – 1 digit (% of Total)

	1993								2000							
	Primary		Intermediate		Final		Total		Primary		Intermediate		Final		Total	
STCI	EXP	IMP	EXP	IMP	EXP	IMP	EXP	IMP	EXP	IMP	EXP	IMP	EXP	IMP	EXP	IMP
0	1,5	1,5	1,0	1,0	5,5	4,9	**8,0**	**7,4**	0,3	0,4	0,6	0,5	2,1	1,0	**3,0**	**1,9**
1	0,2	0,1	0,0	0,0	1,1	0,5	**1,3**	**0,6**	0,0	0,0	0,0	0,0	0,3	0,1	**0,3**	**0,1**
2	1,4	4,3	0,7	2,1	0,1	0,0	**2,1**	**6,4**	1,0	3,3	1,0	2,7	0,1	0,0	**2,2**	**6,0**
3	1,1	2,4	1,1	4,2	0,4	0,0	**2,5**	**6,6**	0,2	1,4	1,3	1,8	0,3	0,0	**1,9**	**3,2**
4	0,0	0,0	0,4	0,2	0,0	0,0	**0,4**	**0,2**	0,0	0,0	0,3	0,0	0,0	0,0	**0,3**	**0,0**
5	0,0	0,0	8,3	6,1	3,4	0,2	**11,7**	**6,3**	0,0	0,0	8,7	4,8	2,2	0,3	**10,8**	**5,2**
6	0,0	0,2	19,1	20,6	2,0	3,4	**21,1**	**24,2**	0,2	0,2	21,3	20,5	1,7	3,0	**23,2**	**23,7**
7	0,0	0,0	14,2	8,6	25,5	11,6	**39,7**	**20,3**	0,0	0,0	22,4	23,0	23,6	14,1	**46,1**	**37,1**
8	0,0	0,0	2,6	2,0	10,5	26,1	**13,1**	**28,1**	0,0	0,0	3,1	4,0	9,2	18,8	**12,3**	**22,8**
9	0,0	0,0	0,0	0,1	0,0	0,0	**0,0**	**0,1**	0,0	0,0	0,0	0,0	0,0	0,0	**0,0**	**0,0**
Total	**4,2**	**8,5**	**47,4**	**44,8**	**48,4**	**46,7**	**100,0**	**100,0**	**1,7**	**5,3**	**58,7**	**57,5**	**39,5**	**37,3**	**100,0**	**100,0**

Source: Own calculations based on Eurostat database.

UN Statistics Division – Standard Industrial Trade Classification (SITC)
Division 0: Food and Live Animals
Division 1: Beverages and Tobacco
Division 2: Crude Materials, Inedible, Except Fuels
Division 3: Mineral Fuels, Lubricants and Related Materials
Division 4: Animal and Vegetable Oils, Fats and Waxes
Division 5: Chemicals and Related Products, n.e.s.
Division 6: Manufactured Goods Classified Chiefly by Material
Division 7: Machinery and Transport Equipment
Division 8: Miscellaneous Manufactured Articles
Division 9: Commodities and Transactions Not Classified Elsewhere in the SITC

Source: United Nations

Table 17: RCA of EU' Trade with CEEC by SITC Division 7 - 2 digits- in 2000

Stages	CEEC-5		Balkans		Baltic		Cohesion	
STCI	Intermediate	Final	Intermediate	Final	Intermediate	Final	Intermediate	Final
71	-53,9	1,5	3,3	-2,4	-2,2	1,6	9,5	4,7
72	-7,8	24,3	-0,6	42,0	1,9	37,3	2,8	26,1
73	-1,5	3,7	-5,3	-6,4	0,2	4,8	0,5	2,2
74	-3,5	20,0	-28,2	27,1	12,8	40,7	2,5	16,3
75	0,7	-16,9	0,9	22,4	1,3	32,4	0,6	11,8
76	4,0	-0,1	-19,9	-3,5	22,6	-253,3	3,7	27,2
77	-28,5	-5,9	-27,8	6,7	24,3	47,7	-2,0	0,2
78	25,0	41,5	-10,9	33,5	6,4	21,0	1,5	-103,1
79	-1,3	-1,3	-0,2	-30,7	0,4	0,3	-5,0	0,5

Source: Own calculations based on Eurostat database.

SITC Division 7: Machinery and Transport Equipment
71: Power-generating machinery and equipment
72: Machinery specialised for particular industries
73: Metalworking machinery
74: General industrial machinery and equipment, n.e.s., and machinery parts, n.e.s.
75: Office machines and automatic data-processing machines
76: Telecommunications and sound-recording and reproducing apparatus and equipment
77: Electrical machinery, apparatus and appliances, n.e.s., and electrical parts thereof (including non-electrical counterparts, n.e.s., of electrical household-type equipment)
78: Road vehicles (including air-cushion vehicles)
79: Other transport equipment

Source: United Nations

Table 18: Bilateral Intra-Industry Trade in 2000

	Estonia	Latvia	Lithuania	Poland	Czech R.	Slovakia	Hungary	Romania	Bulgaria	Slovenia	CEEC	Intra-EU
France	6,2	7,7	8,2	24,6	40,4	18,4	29,9	23,5	14,9	29,9	41,7	69,9
Netherlands	2,0	3,3	6,4	20,6	29,9	21,9	22,2	6,0	6,4	10,2	31,5	60,1
Germany	9,1	9,4	12,0	31,5	50,3	28,2	35,9	16,7	11,8	32,1	47,7	64,5
Italy	6,7	5,2	5,7	26,7	26,0	16,5	30,2	27,4	21,4	28,9	37,3	50,0
U.K.	5,4	3,8	3,5	21,7	36,8	17,7	24,7	11,0	6,9	18,4	31,3	60,9
Ireland	2,5	3,6	1,0	3,0	8,2	4,9	17,2	10,8	1,0	4,4	16,2	37,2
Denmark	10,2	13,4	19,9	22,9	14,1	6,7	11,5	4,0	1,8	12,2	26,6	48,9
Greece	0,1	0,4	20,7	2,2	2,2	0,6	4,4	16,7	33,6	0,9	25,8	14,4
Portugal	0,3	10,9	0,3	3,1	9,1	7,3	7,8	0,9	0,8	5,9	14,4	40,1
Spain	2,3	1,2	2,1	19,9	27,9	11,5	15,7	4,9	5,8	15,9	32,5	56,3
Bel.-Lux.	6,4	2,6	6,2	19,1	23,5	16,9	14,3	10,8	4,0	9,9	24,0	63,8
Sweden	22,1	9,5	7,2	26,2	14,0	13,0	19,1	9,5	8,7	7,5	38,7	47,5
Finland	28,4	7,4	7,4	8,6	6,6	2,7	10,0	1,6	1,1	5,2	38,7	28,6
Austria	3,0	6,7	4,4	17,5	38,8	26,5	36,5	18,3	13,1	35,0	45,0	54,9

Source: Own calculations based on Eurostat database.

Table 19: IIT Between EU and Each Country in 2000

STCI Divisions	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
France	52,1	25,5	47,4	41,2	39,3	63,3	65,6	68,9	66,6	52,7
Netherlands	45,3	32,6	34,3	62,2	56,1	55,5	61,7	59,9	70,4	85,5
Germany	54,8	54,9	49,6	37,5	56,6	68,6	69,2	69,3	72,3	77,6
Italy	28,9	15,5	33,3	31,6	51,1	51,8	49,7	56,0	42,4	66,6
U.K.	39,1	27,5	26,6	37,0	43,5	58,3	56,0	69,9	67,9	60,5
Ireland	32,5	46,0	20,5	4,8	9,4	18,2	31,8	36,8	36,9	66,7
Denmark	36,9	17,3	32,9	14,7	49,1	42,4	44,7	49,8	61,0	68,6
Greece	11,1	11,4	14,2	10,8	1,6	13,0	11,9	9,0	26,7	16,1
Portugal	21,5	57,0	20,8	16,6	32,0	29,2	33,1	23,2	43,6	23,6
Spain	34,0	27,7	43,8	20,9	13,0	54,3	59,1	60,4	60,1	27,3
Bel.-Lux.	59,4	56,3	61,0	56,1	58,8	58,3	56,7	69,7	72,8	55,2
Sweden	32,4	9,1	15,9	39,1	31,0	52,6	43,2	50,5	60,0	69,3
Finland	18,6	10,8	6,1	16,8	18,1	42,3	18,1	44,9	45,5	37,7
Austria	40,7	55,8	41,2	4,8	15,0	48,1	50,8	45,0	51,4	46,6
Estonia	4,5	3,6	3,6	0,0	3,3	5,8	23,3	23,0	37,1	0,0
Latvia	2,0	3,5	1,7	2,6	0,1	2,6	8,8	9,8	27,6	0,8
Lithuania	1,4	9,8	2,8	2,3	1,7	3,7	20,1	7,1	22,2	13,0
Poland	9,5	22,6	24,4	15,0	7,1	16,2	33,5	32,0	37,0	47,5
Czech R.	13,6	4,0	27,5	32,0	12,0	27,5	47,6	56,4	54,1	45,9
Slovakia	2,7	11,4	6,0	0,9	1,0	14,9	24,1	36,1	29,8	41,9
Hungary	15,0	27,6	16,1	25,5	17,8	21,6	36,1	34,4	47,6	45,5
Romania	1,7	0,1	7,0	11,4	2,3	5,3	13,3	34,7	20,5	17,1
Bulgaria	4,9	2,9	8,1	39,6	1,6	4,1	9,7	22,0	28,2	0,3
Slovenia	7,8	7,8	20,7	0,1	12,2	20,5	36,9	37,6	43,2	26,6

Source: Own calculations based on Eurostat database.

Table 20: IIT Between EU and Each Country (Variation in 1993/2000)

STCI Divisions	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
France	3,6	0,4	5,2	-3,3	-9,9	-0,2	-1,2	-9,1	0,2	-31,8
Netherlands	1,2	-7,3	-2,6	18,4	4,4	-5,2	-2,7	-9,7	0,0	11,9
Germany	9,6	17,4	7,4	8,8	-3,2	3,7	2,9	-4,9	11,9	51,2
Italy	2,7	-11,1	2,9	8,0	19,0	-0,7	3,2	-4,8	5,5	-16,1
U.K.	-4,5	7,7	-13,1	7,4	3,3	-4,0	-2,6	1,9	-4,8	-24,1
Ireland	8,9	8,7	4,5	-18,6	-5,8	-16,0	-5,5	-7,6	-10,4	14,1
Denmark	7,9	1,0	0,1	-17,3	16,1	5,8	2,3	1,5	8,4	-17,5
Greece	0,6	-4,3	5,5	-37,7	-2,3	3,5	-9,1	-1,6	-1,2	-63,4
Portugal	1,1	45,9	3,5	-24,0	23,5	5,4	2,0	-10,6	6,8	-64,9
Spain	6,1	10,1	7,0	-22,6	-1,8	4,1	1,7	-5,1	11,4	-61,1
Bel.-Lux.	8,3	8,2	5,3	-14,6	-5,3	-1,9	1,9	6,8	6,5	-31,4
Sweden	11,1	2,2	7,4	-5,1	7,7	6,9	7,3	-11,1	10,3	30,0
Finland	0,3	1,6	-0,5	-9,8	6,1	11,6	5,2	-0,9	-1,1	-1,1
Austria	11,6	4,5	10,6	-21,2	3,3	6,1	-1,2	-6,6	-7,3	-10,0
Estonia	2,9	0,9	-4,8	-7,3	2,7	5,2	17,6	17,7	17,7	-15,5
Latvia	0,2	0,3	0,9	2,3	0,1	-0,2	4,8	6,3	-7,0	-21,2
Lithuania	0,0	8,3	0,9	2,0	1,7	2,2	10,2	4,4	-7,9	-22,1
Poland	0,3	12,1	7,6	10,6	-0,8	2,5	9,7	-7,7	13,1	1,8
Czech R.	3,0	-1,5	5,4	3,0	3,8	8,6	7,5	9,5	8,3	-9,5
Slovakia	-5,4	9,0	-8,9	-74,5	-21,7	-1,2	3,5	9,5	4,1	-19,5
Hungary	2,4	8,8	0,9	19,4	7,7	-1,6	0,1	1,3	3,8	-4,9
Romania	-1,9	-14,9	-8,3	-24,9	-30,6	-1,5	0,3	19,5	0,4	-22,0
Bulgaria	-5,5	-7,4	-1,8	20,7	-14,0	-6,4	-11,8	2,6	-1,4	-53,4
Slovenia	-5,1	-2,6	0,2	-0,8	4,5	-0,2	4,3	-12,5	12,6	-18,3

Source: Own calculations based on Eurostat database.

Table 21: RCA by Types of Trade in 2000

	RCA			Variation (% in 1993/2000)		
	One-way	Horz	Vert	One-way	Horz	Vert
Greece	-95,7	15,9	78,2	0,8	-2,4	9,6
Portugal	-80,4	9,6	69,7	-27,9	33,7	-0,2
Spain	-29,8	58,4	-29,4	-23,5	54,4	-29,7
Estonia	22,9	-34,9	12,6	52,6	-31,8	-16,3
Latvia	7,0	4,1	-11,2	-19,2	7,3	11,6
Lithuania	-48,1	-0,4	47,9	-66,3	0,0	66,9
Poland	-71,4	14,3	57,0	-48,6	7,5	41,1
Czech Rep.	-65,6	25,9	39,4	-4,4	14,0	-10,0
Slovakia	-83,7	13,3	70,4	-68,9	4,6	64,8
Hungary	-78,6	55,2	23,2	-13,1	38,2	-25,4
Romania	-28,3	15,1	13,1	-2,4	6,8	-4,2
Bulgaria	-10,8	1,3	9,5	48,3	-15,4	-31,0
Slovenia	-172,0	30,6	141,1	-136,6	26,3	110,3

Source: Own calculations based on Eurostat database

Table 22: Price-Quality Ranges in Exports (% of Total)

	1993			2000		
	Down	**Middle**	**Up**	**Down**	**Middle**	**Up**
Greece	28,9	35,3	30,2	34,0	38,8	25,2
Portugal	31,8	40,1	24,6	30,2	45,5	22,8
Spain	47,4	34,9	14,7	46,1	34,6	18,3
Estonia	53,9	24,1	20,4	37,0	17,6	45,1
Latvia	28,6	67,6	3,3	64,1	26,2	9,4
Lithuania	32,0	59,3	8,0	54,0	27,7	17,9
Poland	73,6	18,1	8,1	59,8	22,6	17,5
Czech Rep.	70,6	16,1	13,0	61,1	21,9	16,9
Slovakia	73,8	15,9	8,9	50,5	36,9	12,6
Hungary	52,4	23,5	23,9	41,1	30,2	28,9
Romania	78,3	8,9	12,5	63,7	16,4	19,7
Bulgaria	62,9	21,2	12,8	44,3	46,4	9,1
Slovenia	49,0	27,1	23,8	45,3	24,7	29,8

Source: Own calculations based on Eurostat database.

TABLE 23: Price-Quality Ranges in Imports (% of Total)

	1993			2000		
	Down	**Middle**	**Up**	**Down**	**Middle**	**Up**
Greece	18,8	43,0	35,3	21,9	46,4	29,9
Portugal	20,6	52,5	24,4	28,9	50,5	19,3
Spain	14,9	61,8	20,7	25,6	58,1	15,4
Estonia	55,3	14,0	28,5	34,5	20,7	44,4
Latvia	51,3	16,1	30,8	38,9	24,9	34,6
Lithuania	50,2	20,7	27,3	38,0	29,7	31,5
Poland	41,2	29,0	29,8	39,8	36,8	23,2
Czech Rep.	29,5	28,2	41,8	31,5	36,3	32,0
Slovakia	33,2	22,1	44,1	31,3	37,5	31,0
Hungary	39,4	23,7	36,6	35,1	23,5	41,1
Romania	43,9	19,3	36,2	47,7	21,3	30,8
Bulgaria	44,4	19,9	34,6	42,2	23,9	33,3
Slovenia	32,2	32,5	34,7	35,0	32,7	32,0

Source: Own calculations based on Eurostat database.

TABLE 24: RCA by Price-Quality Ranges

	1993				2000			
	Down	**Middle**	**Up**	**Non-Class.**	**Down**	**Middle**	**Up**	**Non-Class.**
Greece	50,7	-38,6	-25,2	13,1	60,6	-38,1	-23,6	1,1
Portugal	55,8	-62,0	0,8	5,4	6,4	-24,7	17,5	0,8
Spain	162,5	-134,3	-30,0	1,8	102,4	-117,1	14,7	0,1
Estonia	-6,9	50,3	-40,4	-3,0	12,5	-15,5	3,8	-0,9
Latvia	-113,8	257,6	-137,7	-6,2	126,1	6,7	-126,4	-6,4
Lithuania	-90,9	192,8	-96,6	-5,3	80,0	-9,9	-68,3	-1,8
Poland	162,3	-54,3	-108,4	0,4	100,1	-70,8	-28,5	-0,8
Czech Rep.	205,7	-60,5	-143,9	-1,3	148,0	-72,1	-75,4	-0,4
Slovakia	203,0	-31,2	-176,2	4,4	96,1	-3,1	-92,1	-0,9
Hungary	65,1	-1,4	-63,6	-0,2	30,1	33,3	-62,5	-0,9
Romania	171,8	-52,4	-118,7	-0,7	80,3	-24,4	-55,6	-0,2
Bulgaria	92,7	6,4	-109,1	10,0	10,6	112,5	-121,0	-2,0
Slovenia	83,8	-27,3	-54,5	-2,0	51,3	-39,9	-10,9	-0,5

Source: Own calculations based on Eurostat database.

Table 25: Classification Broad Economic Categories (BEC)

3 Stages	5 Stages	BEC	Title BEC
Primary Goods		111	Food and beverages mainly for industry
		21	Industrial supplies, n.e.s., primary
		31	Fuels and lubricants, primary
Intermediate Goods	Semi-Finished Goods	121	Food and beverages, processed, mainly for industry
		22	Industrial supplies, n.e.s., processed
		322	Fuels and lubricants, processed
	Parts & Components	42	Of capital goods, except transport equipment
		53	Of tranport equipment
Final Goods	Capital Goods	41	Capital goods except transport equipment
		521	Other industrial transport equipment
	Consumption Goods	112	Food & bev., primary, mainly for household consump.
		122	Food & bev., primary, processed, for household consump.
		51	Passenger motor cars
		522	Other non-industrial transport equipment
		53	Parts and acessories of transport equipment
		61	Durable consumer goods n.e.s.
		62	Semi-durable consumer goods n.e.s.
		63	Non-durable consumer goods n.e.s.
Non-Classified		7	Non-classified

Source: United Nations

Table 26: Classification by Factors of Competitiveness

Industry	Factors of production	Technology Level	Wage Level
Agriculture	Non-Ind.	.	.
Aircraft	R&D	High	High
Basic Iron and steel	Scale	Low	Medium
Chemical products exc. pharmaceuticals	Scale	Medium	High
Communication equipment and parts	Specialised	High	Medium
Electrical machinery and equipment	Specialised	High	Low
Food, beverages and tobacco products	Resource	Low	Low
Machinery exc. electrical, exc. office, accounting machinery and equipment	Specialised	Medium	Medium
Measuring instruments and appliances for, controlling equipment, optical instruments and photographic equipment, clocks	R&D	High	Medium
Metal products exc. machinery and motor vehicles	Labour	Low	Medium
Mining, quarrying	Non-Ind.	.	.
Motor vehicles and parts	Scale	Medium	High
Non-metallic mineral products, glass, glass products and pottery	Resource	Low	Medium
Office, accounting machinery and computers	R&D	High	High
Other manufactured goods	Labour	Medium	Low
Others	Non-Ind.	.	.
Petroleum refineries	Resource	Low	High
Pharmaceuticals, medicinal chemicals and botanical products	R&D	High	High
Primary products of precious and non-ferrous metals	Resource	Medium	Medium
Pulp and paper, printing and publishing	Scale	Low	Medium
Railway, tramway locomotives, motorcycles, bicycles	Scale	Medium	Low
Rubber and plastic products	Scale	Medium	Medium
Semi-conductors	Specialised	High	Medium
Shipbuilding and repairing	Scale	Low	Medium
Textiles, clothing, leather and leather products, footwear	Labour	Low	Low
Waste and scrap	Non-Ind.	.	.
Wood, wood products, furniture	Resource	Low	Low

* (.) Means non-classified goods
Source: see Brucker, H. (1998)

B. Methodology and Data Appendix

B.1. Indicators used in Trade Analysis

B.1.1 Relative Intensity of Export Index

$$RIE = \frac{X_{ij}^{k} * (X_w)^2}{X_i * M_j * X_w^{k}} = \frac{\left(\frac{X_{ij}^{k}}{X_i * M_j} \right)}{\left(\frac{X_w^{k}}{X_w * X_w} \right)}$$

This indicator varies between 0 and + $\overline{}$ and allows examining the increase or reduction in the exporting country's degree of "inter-relation" with different destiny markets. When the indicator is below unity, the bilateral flow reveals an intensity inferior to what it should be considering the average or "neutral" flow, which can be the world's. If the indicator exactly equals unity, the bilateral flow reveals a neutral intensity.

B1.2. Revealed Comparative Advantage Index

$$RCA = \left(\frac{X_i^{k} - M_i^{k}}{X_i + M_i} - \frac{X_i - M_i}{X_i + M_i} \times \frac{X_i^{k} + M_i^{k}}{X_i + M_i} \right) * 1000$$

This indicator is employed (Freudenberg and Lemoine (1999)) to analyse the Comparative Advantages, and highlights the relative strengths and weaknesses of individual sectors in the country's global trade. The first term measures the inter-industry trade against total trade. The second term is meant to eliminate the effects of short-term fluctuations on trade balance.

This indicator compares the actual trade balance of a country for a given product, to the "expected" trade balance for this product. The contribution is positive when the actual trade flow is larger than the expected trade surplus, and also when the relative trade deficit is smaller than the expected trade deficit.

In this present study, a positive value of the index reveals comparative advantage of the EU, while a negative value suggest comparative advantage of the trade partner (CEEC or cohesion Country).

B.1.3. Trade Diversion Index

$$TD_{ij} = \sum_{k} \frac{X^{k}_{iEU}}{X^{k}_{jEU}}$$

B.1.4. Trade Creation Index

$$TC_{ij} = \sum_{k} \frac{X^{k}_{iEU}}{M^{k}_{jEU}}$$

B.1. 5. Intra-Industry Trade Index (IIT)

$$GL_{i} = \frac{\left(X^{k}_{i} + M^{k}_{i}\right) - \left|X^{k}_{i} - M^{k}_{i}\right|}{\left(X^{k}_{i} + M^{k}_{i}\right)} = 1 - \frac{\left|X^{k}_{i} - M^{k}_{i}\right|}{\left(X^{k}_{i} + M^{k}_{i}\right)}$$

$$GL = \sum_{k}\left[GL^{k}_{i} * \frac{\left(X^{k}_{i} + M^{k}_{i}\right)}{\sum_{k}\left(X^{k}_{i} + M^{k}_{i}\right)}\right] = 1 - \frac{\sum_{K}\left|X^{k}_{i} - M^{k}_{i}\right|}{\sum_{K}\left(X^{k}_{i} + M^{k}_{i}\right)}$$

This indicator, developed by Grubel and Lloyd (1975), measures the degree of trade overlap in a given product. However, it can't discriminate between IIT with vertical product differentiation and IIT with horizontal product differentiation.

B.1. 6. Ab-El-Rahman Methodology

Abd-El-Rahman (1986) developed a methodology that distinguishes between horizontal and vertical trade. Using bilateral flows, he refined the definition of IIT at product level. The author disregarded this concept, rather adopting the term "two-way trade" either for horizontally or vertically differentiated products. According to Abd-El-Rahman, the concept of product is related to its technical characteristics, which may be captured using disaggregated data. Similarity depends on the product unit value, assuming that differences in prices reflect differences in quality. By using this methodology three types of trade may be distinguished: two-way trade in similar products; two-way trade in vertically differentiated products and one-way trade.

To differentiate IIT with vertical product differentiation from IIT with horizontal product differentiation, the author employs the following reasoning (Fontagné and Freudenberg (1997):

How to define bilateral trade types at the product level?		
Degree of Overlap between Export and Import values Does the minority flow represent at least 10% of the majority flow?	**Similarity of Export and Import Unit Values:** Do export and import unit values differ less than 15%	
	Yes (Horizontal differentiation)	No (Vertical differentiation)
Yes	***Two-way trade in similar products***	***Two-way trade in vertically differentiated products***
No	**One-way trade**	

B.2. Econometric Specification of the Gravity Model on bilateral Trade Flows

There are several specifications that can be adopted to estimate a gravity model. In the empirical analysis of trade flows, we used panel econometric methods considering a two-way model with time and individual specific effects:

$$Y_{it} = a_0 + d_i + g_t + b_1 X_{1it} + b_2 X_{2it} + ... + e_{it}$$

where Y_{it} represents the logarithm of bilateral exports and X_{kit} (k=1,2, ..) the logarithm of the explanatory variables included in the model. On the other hand, d_i is the unobservable individual effect, g_t is the unobservable time effect and e_{it} is the remainder stochastic disturbance term.

If the X_{kit} are assumed independent of d_i ,e_{it} and g_t are assumed to be fixed parameters to be estimated, then we have a two-way fixed effects error component model. On the other hand, if d_i and g_t are treated as random variables then we have a two-way random effects model. In this model, X_{kit} is assumed to be independent of d_i ,e_{it} and g_t. The Hausman test can be used to compare the Within estimator from the fixed-effects model and the random effects GLS estimator, testing the null hypothesis of no correlation between the individual and time effects and the regressors.

In the present case, the tests performed did reject the existence of no correlation. Hence, as the fixed-effects approach would provide the best estimators, the Within estimator was applied using two different approaches. First, we adopt the most common specification in the literature, considering a country specific effects model. We also consider a more general specification using trading pair-specific or bilateral common effects like it was proposed by Fontaghe et al(1999), Egger and Pfaffermayer (2000) and Cheng and Wall (2001). This type of model assumes that there are systematic differences across pairs of countries captured by country-pair constants. In this fixed-effects model, rather than controlling for time-invariant geographic, cultural and historical factors with a list of particular variables, as in the first case, there is the introduction of fixed effects to control for all time invariant factors that are specific to each of trading pairs.

B.3. Definitions of Variables and Data Sources

B.3.1. Gravity Model on Bilateral Trade Flows

The analysis include the EU countries (14 individual countries as Belgium and Luxemburg were considered as one) and 10 CEEC countries (whenever data on all variables for all the years was available), over the period of 1993-1999.

Dependent variable:

Real Bilateral Exports from country i to country j.

Regressors:

Sum of GDT – Sum of real GDP from both countries

Economic Distance - measured by the absolute value of the difference between the real GDP per capita, between country i and j.

Similarity - similarity in country size in terms of GDP, measured using the Balassa and Bauwens (1987) indicator.

Source: Data on GDP, Population and Exports were taken from CHELEM Database.

Exchange Rate – bilateral real exchange rate index (base=1995).

Source: IMF (International Financial Statistics)

Exch. Rate Volatility – proxy for exchange rate uncertainty calculated as the standard deviation of the percentage change of the real exchange rate from the previous 3 years.

Source: Own calculations based on data from IMF (International Financial Statistics).

The previous variables are in constant values and in US dollars.

Distance- geographic distance expressed in kilometres.

Source:http://www.indo.com/distance/

Frontier – dummy variable equal to one if the two trading partners share a common border.

EU- dummy variable equal to one when the two countries are presently members of the European Union.

Baltic – dummy variable equal to one when one of the trading partners is a Baltic country

B.3.2. Gravity Model on Bilateral FDI Flows

The analysis is performed using OECD data on FDI outflows from Austria, Benelux, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Sweden, Switzerland, United Kingdom, United States and Japan to a total of 24 countries including all the present EU members, Japan, United States, Canada, Australia, Poland, Czech Republic, Hungary, Romania, Slovenia, Slovakia, Estonia, Lithuania, Latvia and Bulgaria, between 1993 and 1999, whenever data is available.

GDPcapi and GDPcapj – GDP per capita from origin country and destination country

Source: Chelem Database

popi and popj – population of both origin and destination countries

Source: Chelem Database

Distj – geographic distance in km between the countries capital

Source: http://www.indo.com/distance/

Frontier – dummy variable equal one if the countries share a common border

CLij – compensation levels of host country in relation to the compensation levels of origin country

Source: World Development Report

All variables are in constant values (1995 US dollars).