Trade Flows among CEEC and EU Countries: what future perspectives?

José Caetano*

University of Évora, Departamento de Economia,
Largo dos Colegiais 2, 7000-803 Évora, Portugal.
Tel. + 351 266 740 894, Fax. +351 266 742 494,
Email address: jcaetano@uevora.pt

Aurora Galego

University of Évora, Departamento de Economia,
Largo dos Colegiais 2, 7000-803 Évora, Portugal.
Tel. + 351 266 740 894, Fax. +351 266 742 494,
Email address: agalego@uevora.pt

April 2005

* Corresponding author

Abstract

The Eastern enlargement represents an opportunity for trade expansion for all the countries involved. In fact, trade between the EU and the Central Eastern European Countries (CEEC) has grown considerably in the nineties, coinciding with the transition period and the preparation of the CEEC to full-membership.

In this paper we analyse the characteristics and evolution of the EU-CEEC trade in the last decade and study the potential bilateral trade flows between the EU and the CEEC. In particular, besides analysing trade relations between CEEC and the EU, we will study trade developments among the CEEC. Moreover, we will take into consideration the sectoral dimension in the analysis.

The analysis is based on the gravity model approach using panel data from 1993 to 2001. It is possible to conclude that there is still scope for further expansion of the trade flows between some CEEC and some of the EU countries. Furthermore, there is scope for growth on trade flows among the CEEC, due to the fact that EU membership will promote complete trade liberalisation among these countries.

1. Introduction

The process of enlargement has originated a vast literature trying to quantify its effects, particularly upon trade relations. Many analyses report changes in terms of volume, composition and nature of trade between EU countries and the CEEC during the process of transition. The enlargement to the East represents an opportunity for trade expansion for both the EU and the CEEC, and in effect trade relations between the EU and the CEEC grew considerably during the last decade.

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. 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. However, recently most papers conclude that actual EU-CEEC trade is either close to potential level or above potential. Other authors have concentrated on the determinants of trade relations and on the evolution of specialization patterns.

In this paper, we analyse the characteristics of trends on the EU-CEEC trade relations during the transition period. In addition, we investigate the determinants of bilateral trade flows and compute the potential trade between the EU countries and the CEEC[1], giving particular attention to the relations among the CEEC.

The evolution of intra-CEEC trade relations has not been receiving enough attention in the literature. The strong dynamics of intra-CEEC trade is not only a result of geographic proximity, but mostly a consequence of industrial location strategies from western companies, which led to the development of cross flows within sectors between countries of the same sub-region. On the one hand, multinationals try to take full advantage of geographic and economic proximity and establish strategic positions in these emergent markets. On the other hand, they intend to collect the benefits of economies of scale and technology spillover effects by structuring more competitive clusters which cross the CEEC national borders. In the context of

[1] We consider in the analysis the following Eastern countries: Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia that joined recently the EU and Bulgaria and Romania which are expected to join the EU in some years to come.

enlargement, one might expect the CEEC to keep up the EU tendency for increasing intra-regional flows and intra-CEEC trade to grow faster than EU-CEEC trade.

One other feature that has not been receiving enough attention in the literature is the sectoral dimension of trade relations. In this paper, an attempt is done to ascertain industry differences, based on the intensity of production factors, in the evolution of trade. In fact, usually the studies consider homogeneity of goods produced using the same proportions of factors. However, lately it has been recognised that the heterogeneity of factor and technological contents draws from different determinants. Therefore, we adopt a classification of industries by the factors considered decisive for the competitiveness of each sector[2], trying to identify the factors explaining the different intensities on trade flows.

The paper is organised as follows. Section 2 reports the global and sectoral trends of trade relations between CEEC and EU, giving particular attention to the relations among the CEEC. Section 3, examines the model specification and the results for both total bilateral trade and the industry differences on the EU and CEEC trade relations. Section 4, gives a brief overview of earlier empirical studies on potential trade and investigates the potential trade flows among these countries. Section 5 concludes.

2. The Dynamics of EU-CEEC Trade

2.1. Global trends in the transition period

The collapse of centrally planned economic regimes in the CEEC, and the subsequent process of economic liberalisation, brought along important transformations in economic terms and of course in external trade. The *European Agreements* were an additional determinant for these countries' reforms. In consequence, after more than one decade of transition process it is possible to identify some major tendencies in the CEEC-EU trade[3].

The CEEC' openness to world markets was rapid and generalised, with the degree of openness[4] evolving from 56% in 1993 to around 80% in 2001 in global terms. In some countries like Estonia, Slovakia, Czech Republic and Hungary, the degree of trade openness already exceeded 100%, which clearly underlines the importance of external trade in new EU members. One

[2] According to Boillot et. al. methodology, the following groups of industries are used: resource intensive; labour intensive; scale and capital intensive; specialised suppliers; R&D intensive.

[3] A detailed analysis on the EU-CEEC trade relations may be seen in Caetano et al. (2004).

other issue that is worth mention is the fact that the CEEC display high and increasing structural trade deficits (around 7,5% of GDP in 2001). In the Baltic countries and in Bulgaria the trade deficit was above 10% of GDP, a result of the deterioration occurred during the last decade.

In this period, there was a progressive orientation of the CEEC trade relations to the EU, which coincided with the decline in the relationships with old members of COMECON. In effect, in 2001, the weight of EU in the CEEC total exports was about 66% (in 1993 it was of 54%), which was close from the average of the EU-15 countries. Though, in spite of the intensification of the trade among the old and new members of the EU, the commercial unbalances have subsisted and the trade relationships with EU have been responsible for about 50% of those countries deficit in 2001. Yet, EU members contribution for this deficit is not equal for all the countries. In fact, Italy, France and Finland have been responsible for around 74% of EU surplus, whereas Germany, Austria[5], Denmark, Greece and Portugal present a deficit in their trade with the CEEC.

In spite of the expansion of the EU-CEEC trade relations, the weight of CEEC in the EU total trade continues to be small in global terms, contributing 5% and 4,3% to the exports and imports, respectively, in 2001 (see Table 1). However, the situation was not similar for distinct countries, with Austria, Greece and Germany displaying the highest values while in the EU peripheral countries, as Portugal and Spain, the weight of CEEC did not exceed 1% of total trade.

Trade intensity[6] is quite different across countries as well, being Hungary, the Czech Republic and Poland, amongst the new members, and Germany, Austria and Finland, on the part of the older EU members, those which are clearly more involved in reciprocal trade. 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. On the contrary, the level of trade is low between the CEEC and the Iberian countries and Ireland, in

[4] Defined as the weight of external trade on GDP.

[5] The deficits for Germany and Austria could be considered as surprising. However, this situation is a consequence of the increasing subcontracting activities between firms in these countries and in CEEC, specially under the regime of "Outward Processing Trade".

spite of an increase in recent years. So, the intensity of trade is higher for neighbouring countries, which are therefore closer in economic, cultural and historical terms. (see table 2 and 3).

Reflecting these asymmetries, new members that share a common border with the former EU members are responsible for 82% of CEEC trade with the EU[7], while the Balkan and Baltic countries present figures of around 10,5% and 7,5%, respectively (Caetano et al., 2004). In what concerns EU member states, trade is also concentrated in frontier countries, with Germany, Austria and Italy being responsible for more than 64% of trade with the CEEC. Portugal, Ireland and Greece, on the other hand, generated only 2,5% of such.

As a consequence of the geographical reorientation of the CEEC trade after the collapse of the their economic regimes, the weight of the intra-CEEC trade in the total trade of these countries has registered a slight reduction, from 14,7% to 13,8% between 1993 and 2001. Nevertheless, in terms of trade dynamics among these countries, there was a sharp decline of 35,8% in the relative intensity of the trade in this period, which was particularly noticeable between 1993 and 1997. On the other hand, after 1997 there was a decline in the intensity of trade with the other CEEC in the former-Czechoslovakia, Estonia and Hungary (see table 4). It has to be referred also that trade intensity was particularly intense in the several sub-regions (CEEC-5, Baltic and Balkan countries- see table 5), which reinforces the conviction that geographical proximity has been a decisive factor of trade intensity and it will probably continue to be a central aspect after the recent enlargement.

3. Trade Patterns by Factor Production

CEEC' economic liberalisation changed the relative costs of production factors, causing adjustments in productive structures and trade patterns, reflecting the pattern of comparative advantages in the countries. For along the period of analysis, there were significant adjustments, as in 1993 CEEC had just left centrally planned economic regimes and in 2001 these countries were already integrated into the international markets and they were getting prepared to join the EU.

[6] 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.

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

The traditional approach of the comparative advantages pattern, relies in the proposition that goods may be classified according to the factor intensities and proportions employed in production. We can then use this approach to explain the structure of trade among CEEC and EU. We have used in this work a classification of sectors according to the factors that are determinant for the competitiveness of each sector (following Boillot et.al., 2003). We have considered five sectoral groups: Natural Resources, Labour intensive, Scale and Capital intensive, Specialised Suppliers (differentiated goods) and R&D intensive.

In 1993, CEEC exports to the EU were fundamentally based on natural resources and labour intensive sectors, reaching about 64% of total exports to the European Union (see Table 6). Profound changes have occurred in the sectoral pattern of comparative advantages in these countries and in 2001 those sectors represented only about 42%. On the other hand, exports of Capital and R&D intensive goods had a significant increase, from 13% to 28% of total exports to EU. The differentiated goods exhibited also a positive evolution.

However, there is strong heterogeneity at the country level, with the most significant progress occurring in the CEEC-5, where the weight of scale and capital-intensive industries in total exports was higher then in any other Eastern countries. These countries show a sharp reduction in the labour intensive industries, as well as strong growth in capital-intensive sectors and differentiated goods. On the other hand, the CEEC´ imports exhibit a similar evolution (Caetano et. al, 2004), suggesting a growing demand for sophisticated goods, from sectors technologically more advanced and that use more qualified labour.

Therefore, the pattern of *Revealed Comparative advantages*[8] of the CEEC-EU trade had undergone significant transformations. Nevertheless, in 2001 the CEEC comparative advantages were still in sectors intensive in natural resources and unskilled labour (see Table 7). In opposition, the comparative advantage of EU countries occurs in sectors intensive in R&D, Capital and Specialised Suppliers.

It is also important to refer that along the years there was an increase in the degree of heterogeneity for the several countries and it is possible to identify different tendencies in the specialization pattern.

[8] The index used can be seen in appendix.

First, those countries with higher level of GDP per capita (CEEC-5) became progressively less dependent on sectors intensive in natural resources and unskilled labour[9]. Second, the comparative advantage of the Baltic countries is still based on natural resources, with the industries of wood and its by-products, and oil refinery highly contributing to this situation. These countries major disadvantages are in sectors intensive in Capital, R&D and Specialised Suppliers. Within the Baltic countries, Estonia presents a different evolution since it reveals advantages on differentiated goods[10], built on a few electrical and home-appliances components[11]. Finally, the Balkan countries are in an intermediate situation, as advantages are centred on sectors more intensive in labour and natural resources, while comparative disadvantages appeared on industries producing differentiated products or intensive in capital and R&D. There were not significant modifications in the Balkan trade patterns.

Meanwhile, there were not many changes in the composition and intensity of factors in the trade relations among the CEEC (see table 8). While in the CEEC´ exports to the EU, differentiated goods and Labour intensive products are more important, in the trade intra-CEEC products intensive in Capital and Scale and in Natural Resources are of greater magnitude. Though, in the CEEC exports to the EU there was a high dynamics in differentiated goods and in the products intensive in R&D and Capital and Scale, while sectors intensive in Natural Resources and labour lost weight in that structure.

Analysing the level of technology employed during the production process allows us also to conclude that there are different tendencies among the countries. In the trade among the CEEC continues to prevail the flows based in low technology (it is about 51% of the total intra-CEEC trade whereas it represents only 30% of the CEEC exports to the EU). Trade in products of high technology represents only 16% of the intra-CEEC trade against 31% in the exports to the EU. For this distinct situation it contributed in a decisive way the dynamics in the period 1993-2001, where exports to EU countries of average products and of high technology increased more than 9pp.

[9] In 2001, Hungary had already a clear comparative advantage in R&D and Differenciated goods in the trade relations with the EU countries.
[10] This type of products represented about 5% of exports to EU and 31% in 2001.
[11] This can be associated with FDI from Finish firms, within the process of production reallocation (Kaitila, 2001).

In short, in the transition period there were several different tendencies in the CEEC trade partners. On the one hand, in the exports to EU there was a rapid growth, in particular in R&D intensive sectors and in differentiated goods. On the other hand, trade relations among CEEC were relatively sluggish, not only in terms of trade intensity but also on the sectoral pattern of trade among these countries. Also, there was an increasing divergence of trade patterns among CEEC which suggests different factor endowments, as well as distinct dynamics of integration into the international process of production.

3. Empirical methodology and results

In order to study bilateral trade relations between the EU countries and the CEEC, and to predict the trade adjustments associated with the removal of trade barriers, we estimate a gravity model for the period between 1993 and 2001, considering data not only on EU countries but also on the CEEC. Besides analysing total bilateral exports we also take a sectoral approach. This later aspect is important as the countries and sectors involved in the process of enlargement display different characteristics and therefore they are expected to have different determinants. As a consequence, one of the aims of this paper is to analyse the relative importance of the determinants of trade for several sectors. The sectoral analysis has not been common in the literature. One of the exceptions is Marques and Metcalf (2003), which have concluded that in fact the determinants of trade differ across sectors. Yet, these authors use a different sectoral classification and a different methodology.

In this paper we employ a gravity model where, following previous studies (like Egger, 2000 or Fontagné at al, 1999), bilateral trade flows are modelled as a function of the sum of GDP of both countries (GDT), the degree of similarity between the two countries (SIM) and the economic distance between the two countries (ED)[12]. We also included the geographic distance between the countries, the existence of a common border and two other dummies: EU (indicating whether both countries belong to the European Union or not) and CEFTA[13] (that equals one if the two trading partners were members of CEFTA).

[12] More detailed information on the data and variables used may be seen in the Appendix .

[13] Central European Free Trade Association, involving Hungary, Slovenia, the Czech Republic, Slovakia, Romania and Poland.

There are several specifications that may be adopted to estimate a gravity model. In this study we try to use appropriated econometric procedures to obtain more accurate results. More specifically a panel data approach is employed in order to take into account unobserved country heterogeneity. We consider a panel data model with both time and individual specific effects. Also we consider a general specification using trading pair-specific or bilateral common effects as it was proposed by Fontagné et al (1999), Egger and Pfaffermayer (2003) and Cheng and Wall (2005), which argued that it is the best specification. Furthermore, it is argued that this general model, considering common bilateral effects, gives better in sample predictions. This type of model assumes that there are systematic differences across pairs of countries captured by country-pair constants. These effects control for all time invariant factors that are specific to each of the trading pairs:

$$Exports_{ijt} = \alpha_0 + \delta_{ij} + \gamma_t + \beta_1 GDT_{ijt} + \beta_2 SIM_{ijt} + \beta_3 ED_{ijt} + \beta_5 dist_{ij} + \beta_6 Frontier_{ij} + \beta_7 EU_{ij} + \beta_8 CEFTA_{ij} + \varepsilon_{ijt}$$

where δ_{ij} represents the unobservable country pair effect, γ_t the unobservable time effect and ε_{ijt} is the remainder stochastic disturbance term. The time dummies were included to capture the effects of any variables affecting bilateral exports that vary over time and that are constant across country pairs. Note also that in this specification we have allowed the country-pair effects (δ_{ij}) to differ according to the direction of the trade, which means that is δ_{ij} is not equal to δ_{ji}. Both dependent variable and explanatory variables included in the model are in logarithms to the exception of dummies.

If δ_{ij} and γ_t are assumed to be fixed parameters to be estimated and the explanatory variables are considered independent of ε_{ijt}, then we have a fixed effects error component model. On the other hand, if δ_{ij} and γ_t are treated as random variables then we have a random effects model. In the random effects model, the explanatory variables are assumed to be independent of δ_{ij}, ε_{ijt} and γ_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, in order to obtain consistent and non-biased estimators, we estimate a fixed effects model

employing the Within estimator. In addition, in all regressions we calculate heteroscedastic consistent standard errors in order to correct for heteroscedasticity problems.

However, the inclusion of country-pair fixed effects does not allow the estimation of the coefficients of the variables which are time-invariant like geographic distance, the existence of frontier, EU or CEFTA. Therefore, we use a two-step procedure proposed by Arellano and Bover (1990) in order to obtain these coefficients. This procedure consists on a regression of the country-pair effects obtained in the within estimation on the time-invariant explanatory variables.

The results for the several sectors and for the total exports can be seen in Table 9. In general the results are in accordance with those usually obtained in the empirical literature on international trade. The estimates support the idea that the size of the economy has a statistically positive influence on bilateral trade relations. On the other hand, countries' economic distance, measuring the relative factor endowments, seems to have a negative impact on bilateral trade flows, which is according to new trade theories. Moreover, according to Linder (1961) the higher the economic distance between countries the bigger the differences in their demand structures. Therefore, trade between countries with similar demand structures is more of intra-industry trade nature and less of inter-industry nature. The results provide a test to this hypothesis and we may conclude that for total trade and most sectors intra-industry trade dominates. It is reasonable to expect the Linder effect not to occur in all the sectors. In fact, the impact of economic distance seems to be not significant for Natural Resources and Labour intensive sectors. This is not surprising as in Natural resources and Labour intensive sectors the nature of trade in mainly of inter-industry type, as predicted by HOS models.

In addition, the results provide evidence in support of economic geography models which state the importance of geography. Indeed, *distance* as well as *frontier* exert a significant influence on the determination of trade flows, both total and sectoral. In fact, the results suggest that R&D sectors seem to be more negatively affected by distance than any others. Also, the existence of common border although with a positive effect in all cases, displays a smaller magnitude in the case of R&D. Distance can be seen as a proxy of all possible trade costs sources. The distance coefficient is always negative and therefore we may conclude that an improvement in the infrastructures will certainly have a positive effect on decreasing the market access gap between the centre and the periphery of Europe.

In this model economic integration is proxied by two dummies, EU and CEFTA. The EU dummy shows the expected result, with the EU integration increasing trade flows among countries on total trade and in all sectors considered. On the other hand, CEFTA is in general positive and significant, with the exceptions of the natural resources and the R&D sectors. Indeed, for R&D sectors the CEFTA variable is significant and negative, implying that this economic agreement did not benefited trade in this sector. Also, the EU integration seems to be special important for trade in R&D sectors.

4. Analysis of Potential Trade Flows

Different theoretical and empirical approaches have analysed the levels of "potential trade" between the CEEC and the EU. Gravity models have been the most widely adopted in assessing the impact of the enlargement on trade potential. The results of these studies have been contradictory, as some, like Hamilton and Winter (1992), Baldwin (1994), Buch and Piazolo (2000) and Jakab et al (2001), concluded that there is still scope for growth on the EU-CEEC trade and others refer that trade potential is either close to the potential level or even above potential (for example Gros and Gonciarz (1996), Festoc (1997) and Nilsson (2000)).

The distinct results are mainly due to two 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 result, 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.

First, many studies apply cross-section instead of panel data. Previous papers (Breuss and Egger (1999), Egger (2000) and Matyas (1997, 1998)) conclude that the use of cross-section data turns the estimates unbiased. Second, when applying panel data methods there is the issue of deciding whether to apply a random effects or a fixed effects model. Usually the fixed effects model reveals itself as the best and, as a consequence, other aspects have to be considered. Many studies use only data on Western countries, performing out of sample predictions to forecast the results for the CEEC, whereas the fixed effects refer only to the countries in the sample. More recent studies, like Nilsson (2000), Buch and Piazolo (2000) or Jakab et al (2001), although applying different methodologies, all base their estimates on data on both the CEEC and the Western countries. The other issue to take into account is the option between the use of country specific fixed effects and country-pair specific effects. The latter

specification is more general and it has been referred recently as the most appropriated [14], but it has not been usually applied on the analysis of trade relations between the CEEC and the EU countries.

Also, most studies do not present individual bilateral trade estimates for all the EU and CEEC countries. Two exceptions are Baldwin (1994) and Nilsson (2000). Few studies have analysed trade among CEEC in particular after the collapse of the central planned regimes. Fidrmuc and Fidrmuc (2003) and Boillot et.al. (2003) are exceptions. Fidrmuc and Fidrmuc (2003) found a decline on bilateral trade intensity among these countries following the collapse of COMECON. Also, they verified that trade between EU15 and the CEEC close to the potential level at the end of the 1990s. On the other hand, Boillot (2003) have concluded that trade among the CEEC is particularly intense inside the several sub-regions like the Baltic and Balkan areas.

In line with previous literature, the estimates from the gravity model presented before were used to analyse whether the potential trade between the EU and the CEEC is above or below the actual level. We computed in-sample predictions of trade between the EU and the CEEC countries in 1993 and 2001 and compare them with the actual values. Furthermore, we have performed the same procedure for the intra-CEEC trade relations for the all period from 1993 and 2001. However, the ratio of the predicted values over the actual ones is also an indication of the goodness of fit of the model. Indeed, large differences between actual and predicted values may indicate misspecification of the model. Therefore, one should be careful on the analysis of this ratio. Instead of analysing the level of the ratio between predicted and actual values we focus on its the evolution over time, as that will provide some information on the trade potential of the countries considered.

The results on the potential versus actual exports from each EU15 country to the total CEEC and from each CEEC to the total EU15 may be seen in table 10. These show the deepening of the process of trade liberalisation between the CEEC and the EU. There are, however, some differences between EU exports to the CEEC and the CEEC' exports. The results suggest that in global terms the CEEC exports have converged more quickly than the EU exports. In particular, there are some indications that might exist a gap between actual and potential exports to the Czech Republic, Estonia and Romania.

[14] See Egger and Pfaffermayer (2003), Fontagné et al (1999) and Cheng and Wall (2005)

In the long run, given the permanent transformation in CEEC´ economic structure, 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 due to the expansion of real incomes and to the progress in market reforms in the candidate countries[15]. Most studies 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.

As we are particularly interested in the relations among the CEEC we present several graphics (see figure 1) with the evolution of the predicted trade flows from each CEEC to the total CEEC over the actual values. The analysis of the results allows us to conclude that the not all the countries have the same evolution along the time period. While some seem to be getting closer from the potential values of trade along the time for others, particularly after 1997, the gap between potential and actual trade flows is getting bigger (especially in the case of Slovakia, Slovenia and Estonia). In the case of Estonia and Slovakia this is not surprising giving the reduction in trade intensity between these countries and the total CEEC after 1997, which we have analysed in section 2. On the other hand, the fact that most countries seem to be getting closer from potential trade is also according to the developments on trade intensity among these countries.

In the near future, it is expected that trade relations among CEEC will reveal high dynamics continuing to increase, not only inside each sub-group of countries (CEEC-5, Baltic and Balkans) but also involving all the others. Other authors, like Boillot et al (2003), have present similar predictions. This is likely to occur due to the recent evolution on these countries trade relations and to the expected reduction in trade costs among these countries. Furthermore, most CEEC already joined EU and it is probable that intra-CEEC trade relations will evolve in similar way to what happened in the previous EU enlargement. In fact, after Spain and Portugal joined the EU bilateral trade relations between the two countries have significantly increased.

[15] See Fontagné et al. (1999) and Auxilioux and Pajot (2001).

5. Concluding Remarks

The liberalization of trade between the EU and the CEEC has promoted the intensification of the bilateral relationships among all of the countries in the two groups. However, this phenomenon did not evolve equally for all the countries, as the Central European countries have experienced the major gains. In this paper, we analysed some aspects of EU-CEEC trade flows, giving particular attention to the Eastern Countries relations. Also, we consider sectoral differences in the analysis of the bilateral trade relations among these countries.

The main conclusion is that, although potential trade is exhausted for most countries in the short-term, there are still some possibilities of trade expansion. These are more evident in the case of trade among CEEC. In the long run, in spite of the reinforcement of the EU-CEEC trade relations, the empirical analysis suggests space for further improvement, mainly due to economic development in the new member countries. The results also imply that the accession of the Eastern countries to the EU will have positive impacts on the intensity of trade.

Geographical and economic factors have to be taken into account when anticipating the trade impacts of enlargement. The enlargement may trigger trade intensity, reviving old economic partnerships among neighbouring countries which, depending on their technological knowledge and factor endowments, will affect the levels of welfare of the involved countries. Although in the short and medium term some countries may experience some negative effects, in the long-term impacts are expected to be positive, given the favourable environment resulting from the economic and monetary stability in the CEEC' emerging markets, which will generate significant opportunities of bilateral trade expansion for all the EU countries.

Although the models´ predictions point towards to an increase in the trade intensity between EU and CEEC and especially among CEEC, it is reasonable to admit that this will not happen in all countries and sectors. According to previous developments and enlargement experiences, it is possible to anticipate that the increase in trade relations will be higher in industries where the presence of multinationals is more significant and where economies of scale and technology spillover effects prevail. Trade flows will tend to increase as income levels converge, demand structures get more similar and international networks expand. As a consequence, depending on each country's competitiveness performance and in its position in the European division of labour, it is expected that significant changes will occur in the comparative advantages patterns.

A. Appendix

A.1. Definitions of Variables

Dependent variables:

Real Bilateral total Exports from country i to country j.
Real bilateral sectoral exports from country i to country j.

Regressors:

GDT – Sum of real GDP from both countries
ED – Economic Distance measured by the absolute value of the difference between the real GDP per capita, between country i and j.
SIM - 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.

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

Dist- 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.

CEFTA – dummy variable equal to one when the two trading partners are member of CEFTA

A.2. Countries Included in the Analysis

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 1993-2001.

A.3. Trade Indexes

1. Relative Intensity of Export Index

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

2. Revealed Comparative Advantage Index

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

References

Arellano, M and O. Bover (1990), "La econometria de los datos de panel", *Investigaciones Económicas*, Segunda Época, XIV (1), pp. 3-45.

Aussilloux, V. and M. Pajot (2001), "Trade Issues in European Union Enlargement", Paper of the 75th International Conference: *Policy Modeling for European and Global Issues*, July, Brussels.

Baldwin, R. (1994), "Towards an Integrated Europe", CEPR, London.

Boillot, J., J. Lefilleur e Y. Lepape (2003), "Quel Avenir au Commerce Intra-Peco? Une Analyse Actuelle et Prévisionnelle des Échanges en Europe Centrale et Orientale", DREE-MINEFI.

Breuss, F. and P. Egger(1999), "How realiable are estimations of East-West Trade Potentials Based on Cross-section Gravity Analysis?" , *Empirica,* 26 (2), pp. 81-94.

Buch, C. and D. Piazolo (2000), "Capital and Trade Flows in Europe and the Impact of Enlargement", Kiel Working Paper 1001.

Caetano, J. et al. (2004) "The European Union´s Fifth Enlargement: Effects on Trade and Foreign Investment" Celta Editora, Oeiras.

Cheng, I-Hui and H. Wall, H. (2005) Controlling for Heterogeneity in Gravity Models of Trade, *The Federal Reserve Bank of St. Louis*, 87(1), pp. 49-63.

Egger, P. And Pfaffermayr, M. (2003) "The Proper Econometric Specification of the Gravity Equation: a Three-Way Model with Bilateral Interaction Effects", *Empirical Economics*, 28(3), pp. 571-580.

Egger, P. (2000) "A Note on the Proper Econometric Specification of the Gravity Equation", *Economics Letters*, 66, pp. 25-31.

Festoc (1997), "Le Potentiel de Croissance du Convergence des Pays d'Europe Central et Orientale Avec la France e Ses Principaux Partenaires, *Economie e Prevision,* 128, pp. 161-181.

Fidrmuc, J. and J. Fidrmuc (2003), "Disintegration and Trade ", *Review of International Economics*, vol. 11, n. 5, pp. 811-829.

Fontagné, L. et al. (1999), "Le Potentiel d'Échanges entre l'Union Européenne et les PECO", *Révue Économique,* 50 (6), pp. 1139-1168.

Gros, D. and A. Gonciarz (1996), "A Note on the Trade Potential of Central and Eastern Europe", *European Journal of Political Economy,* 12, pp. 709-721.

Hamilton, C. and C. Winter (1992), "Opening Up International Trade with Eastern Europe", *Economic Policy*, 14, 77-116.

Kaitila, V. (2001), "Accession Countries' Comparative Advantage in the Internal Market: A Trade and Factor Analysis", BOFIT Discussion Papers no. 3.

Jakab, Z. et al. (2001), "How Far Has Trade Integration Advanced ? : An Analysis of the Actual and Potential Trade of Three Central and Eastern European Countries*", Journal of Comparative Economics,* 29, pp. 276-292.

Linder S. (1961), "An Essay on Trade and Transformation", Wiley and Sons, New York.

Marques. H. and H. Metcalf (2003) "What Determines Sectoral Trade in the Enlarged EU?", Department of Economics Discussion Papers 03-08, Loughborough University.

Matyas, L. (1997) "Proper Econometric Specification of the Gravity Model", *World Economy,* 20(3), pp. 363-368.

Matyas, L. (1998) "The Gravity Model: Some Econometric Considerations*", World Economy*, 21(3), pp. 397-401.

Nilsson, L. (2000) "Trade Integration and the EU Economic Membership Criteria*", European Journal of Political Economy,* 16, pp. 807-827.

TABLES AND FIGURES

Table 1: EU members trade flows with CEEC (% of Total)

	Weight in total trade of each EU country					Share of each EU country in total EU-CEEC Trade			
	1993		2001			1993		2001	
	Exp.	**Imp.**	**Exp.**	**Imp.**		**Exp.**	**Imp.**	**Exp.**	**Imp.**
Germany	4,6	4,5	8,4	8,6	Germany	52,1	56,2	42,4	45,2
Austria	0	0	12,6	9,5	Austria	0	0	7,0	6,3
Bel.-Lux.	1,1	0,7	2,5	2,5	Belg.-Lux.	3,9	3	4,3	4,3
Denmark	2,2	2,5	3,6	4,3	Denmark	2,3	2,6	1,6	1,9
Spain	1	0,6	2,8	1,8	Spain	1,9	1,6	3,0	2,9
Finland	0	0	6,6	6,0	Finland	0	0	2,6	2,1
France	1,4	1,1	3,4	2,7	France	9,2	8,4	10,7	9,7
Greece	6,5	2,1	11,9	3,9	Greece	1,6	1,7	1,1	1,2
Netherlands	1,7	1,6	3,0	2,4	Netherlands	6,3	6,5	4,7	4,4
Ireland	0,4	0,4	1,0	1,4	Ireland	0,4	0,3	0,8	0,7
Italy	3,2	2,5	6,5	4,6	Italy	15,9	12,9	13,9	11,2
Portugal	0,2	0,3	1,0	0,7	Portugal	0,1	0,2	0,2	0,3
United Kingdom	1,2	0,9	2,1	2,1	United Kingdom	6,4	6,6	4,9	6,9
Sweden	0	0	4,7	4,6	Sweden	0	0	2,8	2,9
EU	**2,5**	**2,1**	**5,0**	**4,3**	**Total**	**100**	**100**	**100**	**100**

Source: Own Calculations based on CHELEM database - CEPII.

Table 2: Relative Intensity of Export Index in bilateral trade

	CEEC			EU	
	1993	**2001**		**1993**	**2001**
France	0,73	1,14	Slovenia	1,64	1,67
Bel-Lux	0,6	0,84	Estonia	1,33	1,77
Germany	2,4	2,83	Latvia	1,48	1,66
Italy	1,63	2,19	Lithuania	0,92	1,44
Netherlands	0,77	1,02	Bulgaria	0,86	1,39
United Kingdom	0,65	0,71	Czech Republic	1,33	1,81
Ireland	0,21	0,34	Slovakia	0,84	1,56
Denmark	1,14	1,20	Hungary	1,54	1,84
Finland	2,23	2,20	Poland	1,77	1,82
Sweden	1,1	1,57	Romania	1,07	1,80
Austria	5,12	4,22			
Spain	0,51	0,96			
Greece	3,24	3,99			
Portugal	0,12	0,32			
European Union	**1,41**	**1,68**	**CEEC**	**1,39**	**1,76**

Source: Own Calculations based on CHELEM database - CEPII.

Table 3: Hierarchy of Relative Intensity of Export Index

Order	1993			Order	2001		
1	Finland	Estonia	49,80	1	Greece	Bulgaria	44,30
2	Estonia	Finland	32,09	2	Estonia	Finland	41,87
3	Greece	Bulgaria	27,30	3	Finland	Estonia	25,91
4	Austria	Hungary	10,02	4	Greece	Romania	13,66
5	Estonia	Sweden	9,67	5	Bulgaria	Greece	13,60
6	Bulgaria	Greece	8,83	6	Estonia	Sweden	12,32
7	Austria	Slovenia	8,73	7	Austria	Slovenia	9,91
8	Sweden	Estonia	7,57	8	Latvia	Sweden	8,65
9	Hungary	Austria	7,11	9	Finland	Latvia	8,49
10	Latvia	Denmark	6,59	10	Sweden	Estonia	7,83
643	Portugal	Slovakia	0,05	643	Portugal	Estonia	0,15
644	Portugal	Poland	0,04	644	Estonia	Greece	0,15
645	Lithuania	Ireland	0,04	645	Slovenia	Ireland	0,15
646	Portugal	Latvia	0,02	646	Slovakia	Ireland	0,14
647	Estonia	Ireland	0,02	647	Portugal	Romania	0,14
648	Latvia	Greece	0,02	648	Slovakia	Portugal	0,11
649	Slovakia	U.K.	0,01	649	Latvia	Portugal	0,10
650	Slovakia	Ireland	0,01	650	Portugal	Slovakia	0,10
651	Portugal	Lithuania	0,01	651	Portugal	Slovenia	0,09
652	Ireland	Slovakia	0,00	652	Lithuania	Portugal	0,07

Source: Own Calculations based on CHELEM database - CEPII.

Table 4: Growth rate of Relative Intensity of Export to CEEC (%)

	Growth rate		
Exporters	1993-97	1997-01	1993-01
Estonia	-25,7	-13,6	-35,8
Latvia	-4,4	33,7	27,9
Lithuania	-42,8	63,8	-6,3
Slovenia	5,1	25,8	32,3
Czech Rep.	-30,0	-29,2	-50,5
Slovakia	-45,7	-27,4	-60,6
Hungary	-26,6	-9,2	-33,4
Poland	15,8	20,8	39,9
Romania	-35,8	45,9	-6,3
Bulgaria	-39,4	23,1	-25,4
CEEC	-28,9	-9,6	-35,8

Source: Own Calculations based on CHELEM database – CEPII

Table 5: Relative Intensity of Export Index among CEEC* (2001)

Exports	Baltics	CEEC-5	Balcans	CEEC-10
Baltics	66,5	1,1	0,2	4,9
CEEC-5	3,1	7,5	3,2	5,3
Balcans	0,9	1,8	7,8	1,9
CEEC-10	6,6	5,1	3,1	4,5

Source: Own Calculations based on CHELEM database – CEPII

- We have considered the average of bilateral trade values

Table 6: CEEC Exports to EU by Factors of Production (% of Total)

	Natural Resources		Labour		Scale and Capital		Specialised Suppliers		R&D	
	1993	**2001**	**1993**	**2001**	**1993**	**2001**	**1993**	**2001**	**1993**	**2001**
Poland	44,0	30,5	25,3	17,7	20,3	25,6	9,5	25,0	0,8	1,3
Hungary	33,6	12,7	27,2	10,4	15,6	20,4	21,5	42,9	2,0	13,6
Slovakia	28,9	14,8	26,4	17,4	33,4	43,0	10,3	21,8	1,1	2,9
Slovenia	19,7	22,1	30,4	16,3	25,7	32,8	20,7	25,2	3,6	3,5
Czech Rep	29,9	15,3	23,9	14,7	27,4	32,6	16,4	32,4	2,3	5,1
Bulgaria	40,4	27,6	33,8	41,6	13,7	19,8	9,1	9,5	3,0	1,5
Romania	29,4	18,5	51,0	55,4	11,6	9,7	6,8	15,0	1,1	1,4
Lithuania	75,5	48,2	11,1	31,9	11,7	11,2	1,4	7,6	0,2	1,1
Latvia	85,7	74,8	6,9	16,2	6,3	5,5	0,9	2,7	0,1	0,9
Estonia	58,6	45,1	25,6	16,6	10,3	6,3	5,0	30,4	0,5	1,4
CEEC	**37,0**	**22,3**	**27,1**	**19,5**	**20,6**	**24,9**	**13,6**	**28,2**	**1,7**	**5,0**

Source: Own Calculations based on CHELEM database - CEPII.

Table 7: RCA of EU´ Trade with CEEC by Factors of Production

	Natural Resources		Labour		Scale and Capital		Specialised Suppliers		R&D	
	1993	**2001**	**1993**	**2001**	**1993**	**2001**	**1993**	**2001**	**1993**	**2001**
Poland	115,2	87,6	37,6	15,4	-51,8	-40,6	-66,3	-20,5	-34,7	-41,9
Hungary	100,8	21,3	32,4	-13,4	-73,9	-69,4	-27,7	47,7	-31,5	13,8
Slovakia	66,8	23,9	41,7	17,3	52,9	46,7	-120,4	-57,2	-41,0	-30,6
Slovenia	11,7	20,3	51,7	0,1	-57,5	-5,6	4,1	2,4	-10,1	-17,1
Czech Rep	74,6	13,6	40,1	14,0	5,0	3,2	-80,8	-12,1	-38,8	-18,7
Bulgaria	66,8	70,3	65,8	59,3	-54,4	-20,8	-52,4	-67,5	-25,9	-41,3
Romania	41,6	49,5	113,0	97,6	-43,7	-63,1	-87,0	-53,6	-23,7	-30,3
Lithuania	186,0	167,4	-17,8	55,8	-69,0	-95,9	-75,5	-86,9	-23,7	-40,3
Latvia	254,8	284,3	-46,4	0,3	-98,4	-118,5	-86,0	-118,4	-24,1	-47,8
Estonia	124,5	135,7	36,2	0,5	-64,6	-112,4	-69,3	6,9	-26,8	-30,7
CEEC	**92,6**	**51,2**	**40,6**	**16,3**	**-41,7**	**-35,1**	**-60,1**	**-11,2**	**-31,4**	**-21,3**

Source: Own Calculations based on CHELEM database - CEPII.

Table 8: CEEEC Exports by Factors and Tecnology level (% of total)

	Intra-CEEC			UE		
Factors of Production	**1993**	**2001**	**Var.(%)**	**1993**	**2001**	**Var.(%)**
Natural Resources	33,4	33,1	-0,25	37,0	22,3	-14,70
Labour	11,5	10,4	-1,11	27,1	19,5	-7,60
Capital and Scale	34,4	36,0	1,56	20,6	24,9	4,30
Specialised Suppliers	14,7	15,8	1,14	13,6	28,2	14,60
R&D	6,0	4,7	-1,34	1,7	5,0	3,30
Total	100	100		100	100	
Tecnology Level						
Low Intensity	51,5	51,1	-0,39	39,3	30,0	-9,27
Medium Intensity	32,6	32,7	0,14	34,9	38,6	3,70
High Intensity	15,9	16,2	0,25	25,8	31,3	5,58
Total	100	100		100	100	

Source: Own Calculations based on CHELEM database - CEPII.

Table 9: Estimates of the Gravity Model on EU/CEEC trade flows

Variable	Natural Resources	Labour	Capital and Scale	Specialised Suppliers	R&D	All Sectors
			Fixed Effects Estimates			
	Coeffic. (Robust SE.)	*Coeffic. (Robust SE.)*	*Coeffic. (Robust SE)*	*Coeffic. (Robust SE.)*	*Coeffic. (Robust SE.)*	*Coeffic. (Robust SE)*
GDT	0.589* (0.070)	0.652* (0.076)	0.431* (0.088)	1.001* (0.124)	0.125 (0.124)	0.658* (0.062)
SIM	0.022*** (0.012)	0.056* (0.012)	0.037* (0.011)	0.030** (0.016)	-0.008 (0.018)	0.033* (0.008)
ED	-0.073 (0.047)	0.037 (0.052)	-0.285* (0.056)	-0.305* (0.068)	-0.267* (0.068)	-0.222* (0.038)
N	4965	4964	4937	4933	4885	4968
Std.Dev. Residual	0.445	0.475	0.531	0.619	0.699	0.360
F test (all coef.=0, except constant)	69.91*	175.91*	148.23*	230.20*	144.31*	282.40*
Hausman Test	277.81*	327.88*	459.34*	185.65*	301.95*	226.15*
			Auxiliary Regression			
EU	2.363* (0.034)	2.471* (0.034)	2.803* (0.047)	2.024* (0.041)	3.732* (0.058)	2.354* (0.031)
CEFTA	0.202* (0.058)	-0.119** (0.060)	0.200* (0.063)	0.370* (0.059)	-1.121* (0.129)	0.159* (0.051)
Dist	-1.314* (0.032)	-1.276* (0.033)	-1.356* (0.048)	-1.364* (0.041)	-1.509* (0.057)	-1.281* (0.031)
Frontier	0.800* (0.049)	0.633* (0.055)	0.656* (0.076)	0.420* (0.061)	0.299* (0.097)	0.513* (0.051

All variables are in logs, except for dummies. Time dummies were included but not reported. Variables definition, countries used in regression and data sources can be seen in Appendix.

(*) , (**) and (***) Denotes values significant at 1% , 5% and 10% level, respectively

Table 10: Potential versus Current Exports between EU and CEEC [(a)]

(Potential/Current)

EU Exports			CEEC Exports		
Origin country			**Origin country**		
	1993	**2001**		**1993**	**2001**
Austria	0,7946	1,2474	Bulgaria	1,1006	1,0051
Benelux	1,0477	0,9933	Czech Republic	0,6854	0,3785
Denmark	0,8808	1,2738	Estonia	2,7494	1,4008
Finland	1,5153	1,9269	Hungary	0,9817	0,6008
France	1,0800	0,8253	Latvia	1,0381	1,1515
Germany	0,9214	1,0297	Lithuania	0,9788	0,7578
Greece	0,6769	0,8815	Poland	0,5680	0,4784
Ireland	1,7688	1,0481	Romania	1,3067	0,7089
Italy	1,0887	1,2056	Slovakia	1,2877	0,7259
Netherlands	0,8206	1,0783	Slovenia	0,8220	1,0201
Portugal	1,5321	0,7476			
Spain	1,4672	0,9393			
Sweden	1,3649	1,6173			
United Kingdom	0,9405	1,1350			
Destination Country			**Destination Country**		
	1993	**2001**		**1993**	**2001**
Bulgaria	1,0885	0,9851	Austria	0,7508	0,7593
Czech Republic	0,7614	1,0467	Benelux	1,1162	0,4942
Estonia	0,9868	1,2684	Denmark	0,7608	0,6718
Hungary	1,8355	1,2684	Finland	0,9161	0,8577
Latvia	0,9673	1,0308	France	0,8958	0,5033
Lithuania	1,5754	0,9695	Germany	0,7980	0,6095
Poland	1,5205	0,8691	Greece	0,8793	0,8688
Romania	0,9096	1,2610	Ireland	0,8050	0,3771
Slovakia	1,0465	0,8676	Italy	0,9338	0,6957
Slovenia	1,2559	0,9316	Netherlands	0,7139	0,7712
			Portugal	1,0416	0,6648
			Spain	1,2272	0,4719
			Sweden	1,1446	0,8757
			United Kingdom	0,8767	0,6659

(a) These results were obtained using the estimates from the specification considering total exports

FIGURE 1: Potential versus actual exports among CEEC