

Trade Liberalization vs Institutional Change

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Abstract

Empirical studies find that Central and East European (CEE) countries trade much differently than West countries. Using a border effects procedure we find a home bias (preference for trading domestically) much higher for CEE countries than for EU members. The low level of East-West trade can thus be partially explained by the fact that a lot of CEE countries' trade is still taking place within national borders. The integration of CEE countries into the European Union is expected to lead the former becoming more alike the latter, including in the way they trade. In this paper we focus on the factors that are most likely to promote CEE-EU trade integration. Trade liberalization measures undertaken by both parties were very important but did not always produce expected results. Much less progress has been reached in improving the functioning of CEE institutions (e.g. progress in the privatization process, reducing corruption). Moreover, countries where most important changes at the institutional level occurred were also the ones that increased the most their trade with the EU. We study both policies mentioned above (trade liberalization and institutional change) to find which has a stronger impact on CEE-EU trade (in bringing it to the intra-EU level).

1 Introduction

Recently eight Central and East European countries have been accepted to join the European Union. At least three more await a similar decision. EU enlargement will bring very little if any on the trade liberalization axis. Free trade agreements between transition countries and the European Union have done the job. East-West trade liberalization is almost completed: Most tariffs and many non tariff barriers have been already eliminated on both sides. The most important thing that EU accession is expected to bring for these countries is the improvement of the institutional framework.

Recent work on international trade and institutions (Anderson and Marcouiller (2002)) shows that the latter are an important determinant of the former. Hence, improving the functioning of institutions in transition countries both before and after EU accession will boost international trade. Increasing trade is one of every country's priorities because trade (at least exports) drives economic growth (Frankel and Romer (1999)). This can motivate transition countries' efforts to improve national institutions.

Therefore, an issue of greater actuality than trade liberalization for the East-West European integration are institutional changes. Switching from a centrally planned to a market economy implied major institutional changes for all CEE countries. But the

accomplishment of these changes varied a lot across countries. Some countries adopted more radical reforms, others made only “soft” adjustments; in some countries institutions changed very rapidly, while others are still hanging on. The very fact that one CEE country trades more with foreign (EU) partners can be partially explained by the better functioning of its national institutions. The improvement of the quality of institutions, and their harmonisation with respect to EU members and other candidate countries is of great actuality for EU enlargement, and a possible source for increase in bilateral trade. The determination of specific measures that are likely to increase trade the most will therefore lead to better policy measures.

Both trade liberalization and institutional reforms exercise their impact on international trade by lowering transaction costs. Therefore, they may account for a significant part of the border effect, the fact that trade is lost simply because one has to switch from a national to an international environment. Border effects are assimilated in the literature to the level of trade integration. Border effects reveal that an exaggerated volume of trade goes on inside national borders. Empirical works on border effects find an important gap between intra-EU trade and Central and East European transition countries’ trade with the European Union.¹ This suggests that despite the significant efforts of trade integration made by both parties, transition countries still trade very differently from EU members. The accession of these countries to EU is expected to reduce discrepancies at all levels and cause Central and East European countries become more alike present EU members, including in the way they trade.

Next section discusses aspects of trade liberalization and institutional changes. Section 3 presents the trade model integrating both trade liberalization and institutional reform measures. The following two sections discuss used data and estimated results, and section 6 concludes.

2 Institutional Changes and Trade Liberalization

At the beginning of 1990s all transition countries have engaged into a firm process of trade liberalization with the European Union. Despite the fact that time tables and specific measures differed across countries, at the beginning of the 21st century trade with EU of each of them is qualified as almost entirely free. Still, annual growth rates of CEE-EU bilateral trade are far from being the same for all countries (Fig.1).

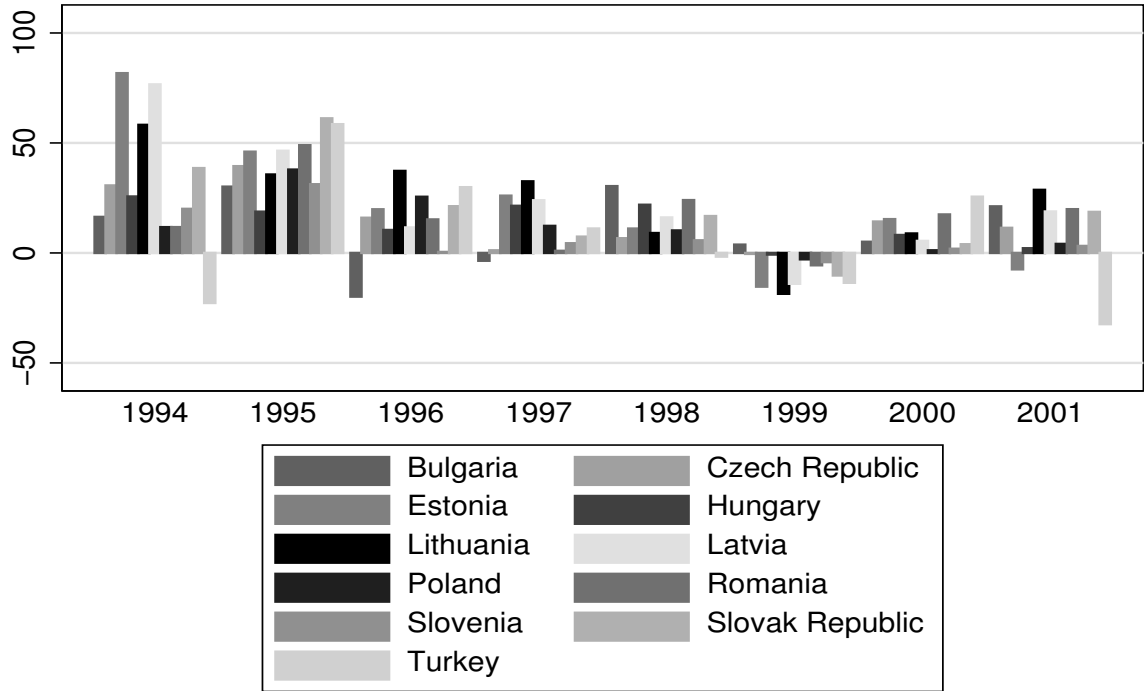
One can easily see from Fig.1 that the major increase in CEE-EU bilateral trade occurred in the first half of 1990s. Most regional trade liberalization measures became effective since 1995, and can only be held responsible for later increases in trade. In the light of works on trade potential, the important early boom in foreign trade of transition countries can be associated with their reintegration into the world economic system.²

But the growth of transition countries’ trade with EU even after 1995 may not be entirely associated with trade liberalization. For instance, highest growth rates of transition countries’ exports to EU partners do not always correspond to lowest tariffs (table 1). It is certain that other factors are at work. The present paper focusses on the importance of

¹Head and Mayer (2002b), Nitsch (2000), Disdier and Mucchielli (2001).

²Wang and Winters (1991), Baldwin (1993), Hamilton and Winters (1992), Harrigan (2003), Gross and Gonciarz (1996), Fontagné, Freudenberg and Pajot (1999).

Annual growth rates of imports from EU (%)



Annual growth rates of exports to EU (%)

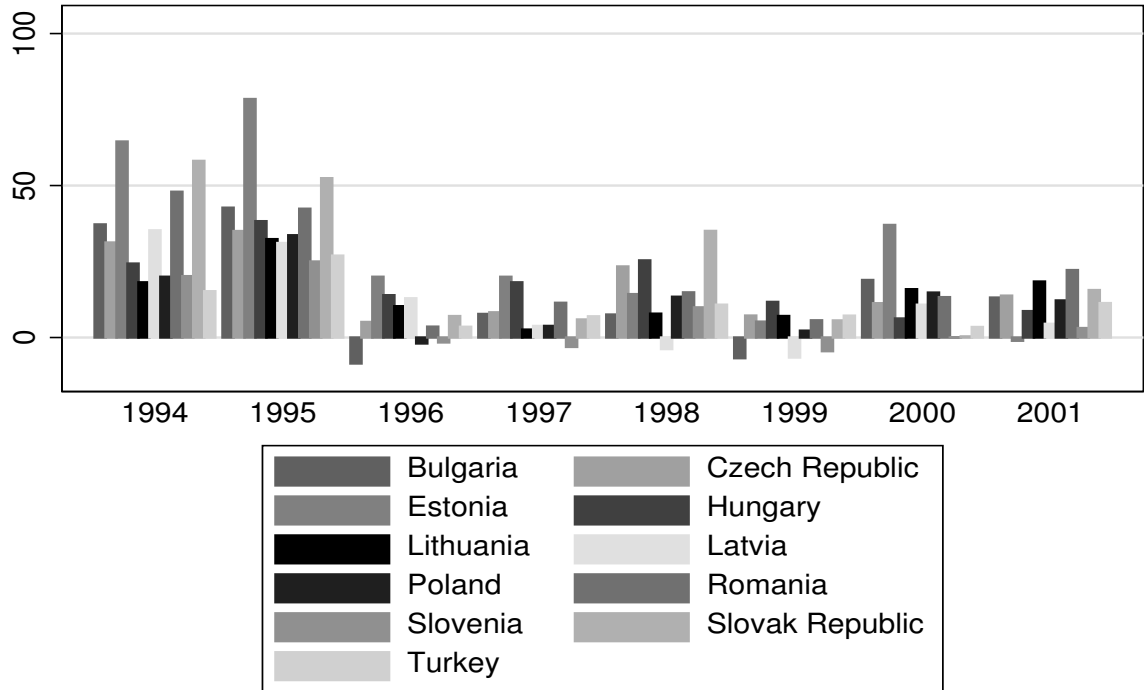


Figure 1: Annual growth rates of CEE-EU trade

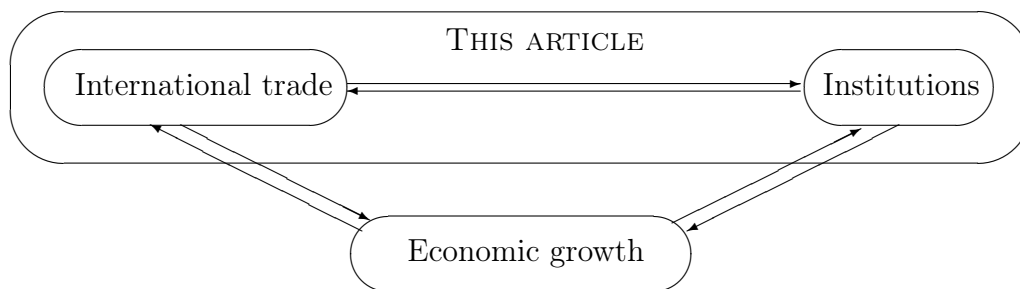


Figure 2: The ‘magic’ triangle: Growth, Trade and Institutions
The sense of causality is given by the sense of arrows.

these additional factors relative to that of trade liberalization in the case of trade between CEE transition countries and EU members.

Recent works on economic growth and international trade show that institutions matter.³ The quality of institutions has an impact on both trade and economic growth, but is also sensitive to changes in the latter two. The interaction between trade, growth and institutions can be represented by a triangle (Fig.2) and only its upper side will be discussed in this paper.

Central and Eastern Europe represents a region with significant institutional changes in the 1990s. The passage from planned to market-oriented economy induced major, although uneven across countries, institutional reforms. Hence, the impact of institutional changes on trade is even more justified for transition countries. The Index of Economic Freedom (IEF), computed by the Heritage Foundation for 161 countries since 1995 is a good indicator of the functioning of national institutions. Computed as a simple average of ten factor scores, it runs from 1 to 5: A score of 1 denotes an institutional framework and a set of policies that are most conducive to economic freedom. Table 1 shows that countries with good IEF scores (closer to 1) also performed well on exports to EU. The country that increased the most its exports to EU was the one that reached the best index of economic freedom. But first we need to define institutions. We adopt here a vision of institutions closer to economics of transition rather than to works on economic growth. We look at the impact of particular socioeconomic variables that can give a significant insight for economic policy, such as respect of property rights, the rule of law, the expropriation risk, corruption, underground economy, and privatisation. Institutions affect trade generally through transaction costs. Good institutions are usually associated with respect of legislation, of property rights, transparency of government regulations, lack of corruption, limited intervention of government in the economy, etc. Such an environment benefits firms not only in avoiding supplementary costs, but also increases the trust of potential partners. Hence, improvement of the institutional framework leads to higher trade integration.

³Rodrik, Subramanian, Trebbi (2002), Frankel and Romer (1999), Sachs and Warner ().

Country	Export growth rate	Index of Economic Freedom	EU average import tariff
	2001/1993	2001	latest available
Estonia	689	2,05	3,83
Slovak Republic	452	3,00	0,00
Romania	408	3,65	3,83
Hungary	374	2,55	0,48
Czech Republic	338	2,20	0,48
Lithuania	281	2,55	3,83
Bulgaria	260	3,30	3,83
Poland	244	2,75	0,53
Turkey	222	2,90	3,83
Latvia	216	2,65	3,83
Slovenia	155	2,90	1,97

Table 1: Tariffs, Institutions and Exports' Growth

3 The Trade Model

We build a trade model inspired by Anderson and Marcouiller (2002) in which bilateral trade is affected by countries' economic environments. We follow Anderson and Marcouiller (2002)'s approach to model the role of institutions in international trade, but contrary from them develop a monopolistic competition model with firm level product differentiation à la DSK.⁴

First, agents determine the proportion of total expenditure to allocate to internationally traded goods, x_j , both foreign and domestic:

$$x_j = \sum_i m_{ij} \quad (1)$$

where m_{ij} are imports by country j of country i products, and p_{ij} represents the price of these goods. Secondly, the x_j value is distributed across varieties. We assume that products are differentiated by firm, that consumer preferences are homothetic, of CES form, and identical across countries and varieties. The utility of the representative consumer of an importing country j is then given by

$$u_j = \left[\sum_i n_i (c_{ij})^{\frac{\sigma-1}{\sigma}} \right]^{\frac{\sigma}{\sigma-1}}, \quad (2)$$

where c_{ij} stands for the volume of country j imports from i , and n_i represents the number of varieties produced and exported by country i .

The demand in country j for goods produced in country i is obtained by solving the optimization program in which importing country j consumers maximize their utility (2) under the budget constraint (1):

$$m_{ij} = n_i \left(\frac{p_{ij}}{P_j} \right)^{1-\sigma} x_j \quad (3)$$

⁴Similar models are developed by Wei (1996) and Keith and Mayer (2000).

with the importer-specific nonlinear price index

$$P_j = \left[\sum_k n_k p_{kj}^{1-\sigma} \right]^{1/(1-\sigma)}. \quad (4)$$

We eliminate nonlinear exporter-specific price indexes P_j and importer-specific expenditure on internationally traded goods x_j by working with relative demands. We choose to divide the demand for goods from each partner country by the importing country's internal demand (i.e. demand for its domestic goods) in order to integrate later in the discussion the notion of border effects:

$$\frac{m_{ij}}{m_{jj}} = \frac{n_i}{n_j} \left(\frac{p_{ij}}{p_{jj}} \right)^{1-\sigma} \quad (5)$$

With symmetric varieties equal quantities q of each variety are produced. A country's output is equal to the sum of outputs of its firms:

$$y_i = \sum_{f=1}^{f=n_i} qp_i = n_i qp_i \quad (6)$$

Finding n_i from (6) and substituting it into (5) yields

$$\frac{m_{ij}}{m_{jj}} = \frac{y_i}{y_j} \left(\frac{p_{ij}}{p_{jj}} \right)^{1-\sigma} \frac{p_j}{p_i}. \quad (7)$$

We turn now to the structure of import prices. We obtain a multiplicative form of the imports price function by assuming mill pricing and "iceberg" trade costs:

$$p_{ij} = p_i \text{ Trade costs}_{ij} \quad (8)$$

with p_i denoting the producer's (mill) price of varieties exported by country i . Like Anderson and Marcouiller (2002) we consider that the price of good i exported to j exceeds the producer's price due to an "insecurity" markup, a transport cost, and a tariff. By "insecurity" markup we understand here hidden transaction costs associated with the nonexistence or the poor functioning of national institutions (as defined in section 2). Anderson and Marcouiller (2002) show that the magnitude of the insecurity markup depends on the quality of national institutions.⁵

Differently from Anderson and Marcouiller (2002) we let the insecurity markup depend on the quality of institutions of both importing and exporting countries and on the absolute difference in the quality of institutions of the two countries. A complete transaction involves efforts from both sides: The exporter must be able to get its goods out of the country, and the importer must succeed in bringing the goods into hers. Therefore the success of the transaction will be affected by the quality of the institutional environment in both countries. But even when institutions of both trading countries are weak, the

⁵Institutions for the defence of trade and factors that allow traders to use those institutions successfully are considered here.

fact that they function equally bad may enhance bilateral trade. In fact, agents from a country with low quality institutions learn to work in such an environment and can use this knowledge in a similar environment, e.g. when trading with a partner from a country facing the same institutional weakness as their own, leading to a higher number of concluded cross-border transactions.

Thus the price of goods exported by country i to j take the following form:

$$p_{ij} = p_i \underbrace{d_{ij}^\delta}_{\text{transport costs}} \underbrace{(1 + t_{ij})}_{\text{tariff}} \underbrace{S_i^{\gamma_1} S_j^{\gamma_2} \exp(-(S_i - S_j)^2)^{\gamma_3}}_{\text{quality of institutions}} \quad (9)$$

Transport costs are instrumented by distance. The tariff term t_{ij} enters in equation (9) without an exponent because an ad-valorem tariff raises the price precisely in proportion to the tariff. S_i and S_j are variables that measure the quality of institutions in countries i and j respectively. We use a transformation of the absolute difference in institutions' quality between the two trading countries that permits to avoid mathematical nonsense,⁶ and allow bilateral trade to increase with institutional similarity: $\exp(-x)$ is a decreasing function of x .

Setting labour as the unique factor of production we also model the structure of producer prices. In a monopolistic competition setup producers maximize profits by setting marginal cost, $MC_i = w_i k$, equal to marginal revenue, $MR = p_i(1 - 1/\sigma)$, yielding a price

$$p_i = w_i k \sigma / (\sigma - 1). \quad (10)$$

The technological coefficient k is assumed constant across countries. This permits us to identify the ratio of producer prices in equation (7) with the ratio of wages.

Substituting equations (9) and (10) into equation (7) and taking logs,

$$\ln \frac{m_{ij}}{m_{jj}} = \ln \frac{y_i}{y_j} - \sigma \ln \frac{w_i}{w_j} - \sigma \delta \ln \frac{d_{ij}}{d_{jj}} - \sigma \ln (1 + t_{ij}) - \sigma \gamma_1 \ln \frac{S_i}{S_j} + \sigma \gamma_3 (S_i - S_j)^2. \quad (11)$$

In the present paper we focus on the coefficient on the tariff term, the main element of importing country's trade policy, and on coefficients on institutional variables, representing other dimensions of a country's economic policy. In this model both factors have an impact on trade through trade costs. Trade liberalization and the improvement of the quality of national institutions both reduce the level of trade costs, and consequently the price of exchanged goods to consumers, propel international trade.

Equation (7) is very similar to equations used to estimate border effects, i.e. the "loss" in trade volume that occurs exclusively due to switching from a national to an international economic environment, with the use of relative demand.⁷ In this literature

⁶Using the absolute difference between the quality of the institutional framework in the importing and the exporting countries, $|S_i - S_j|$, in the equation of relative demand leads to a division by zero, for $|S_j - S_j| = 0$. Even using inverse relative demand, m_{jj}/m_{ij} , the problem persists when we linearize the model by taking logs: $\ln(0) = \emptyset$. Using the absolute difference $|S_i - S_j|$ will thus result in losing observations.

⁷Head and Mayer (2000), (2002a).

border effects are estimated by the constant of the model. This results from the use of a specific trade cost function, comprising a transport cost term (expressed by distance), d_{ij}^δ , and a border-specific term, $\exp(b_{ij} \text{border}_{ij})$, which accounts for non-linear changes in trade costs caused by the passage from intra-national to international trade or vice-versa:⁸

$$p_{ij} = p_i d_{ij}^\delta \exp(b_{ij} \text{border}_{ij}) \quad (12)$$

where b_{ij} represents the ad-valorem tariff equivalent of costs induced by exporting country i products to country j , and border_{ij} is a border dummy which takes the value 1 for international trade and value 0 otherwise ($\text{border}_{ij} = 1, \forall i \neq j$ and $\text{border}_{jj} = 0$). Hence, the border specific term has no influence for trade within national borders: $p_{jj} = p_j d_{jj}^\delta$.

The border-specific term of equation (12) is a black box in most works on border effects in the sense that little if anything is shown about economic processes behind it. Possible explanations of the border effect phenomenon advanced in the literature include sharing a common border, language and/or colonial history, higher preferences for domestically produced goods, as well as the quality on national institutions. In this article we try to establish a relationship between the quality of institutional framework and the level of border effects. To do so the “raw” border effect, is compared to the border effect corrected by tariffs and quality of institutions. Using equation (7) along with (10) (12) and taking logs, we obtain

$$\ln \frac{m_{ij}}{m_{jj}} = \ln \frac{y_i}{y_j} - \sigma \ln \frac{w_i}{w_j} - \sigma \delta \ln \frac{d_{ij}}{d_{jj}} - \sigma b_{ij} \text{border}_{ij}. \quad (13)$$

The exponential of the absolute value of free term of this equation, $\exp(\sigma b_{ij} \text{border}_{ij})$, gives an estimate of what we call the “raw” border effect, the one usually estimated by the literature on border effects. The corrected border effect can be estimated by the constant of equation (11). A decrease of the free term induced by the inclusion of institutions will shed light on part of the border effect black box.⁹

4 Data

We use data from 25 countries across 5 years. Trade in both senses (imports and exports) between 14 actual EU members,¹⁰ and 11 transition countries willing to join the EU:¹¹ 8 already accepted to do so in 2004, two balkan countries that wait 2007 to start accession negotiations, and Turkey. Turkey was included in the sample because it is in the region, demanded to join the EU just like CEE transition countries, and has economic features close to those of CEE countries.

Bilateral trade data has been collected form the CHELEM database (Cepii). Internal trade m_{jj} , i.e. imports of a country from itself, have been computed following Wei (1996) as the difference between domestic production and the sum exports to all foreign partners.

⁸It may also include a tariff element or a home bias of demand.

⁹Observations

¹⁰Belgium and Luxembourg are aggregated into a single observation.

¹¹Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, Slovenia, and Turkey.

Distance between two countries has been computed as the average distance between largest cities of NUTS level 2 regions of the two countries, weighted with the part of each region’s population in its home country population.¹² Internal distance d_{jj} is computed following the same principle (in order to ensure comparability of the two measures): The weighted by population average of distances between each region to all regions of the country, including itself. For small countries consisting of a single NUTS level 2 region, NUTS level 3 regions have been used. The problem arises in the computation of the distance of a region from itself d_{gg} , which we call intra-regional distance. We overcome this difficulty by identifying each region to a circle of equal area, and assuming that all producers are located in the center while consumers are equally distributed on the area of the circle. This gives the following expression on intra-regional distance:

$$d_{gg} = \int_0^{R_g} \frac{2\pi r}{\pi R_g^2} r = \frac{2}{3} R_g \quad (14)$$

where R_g stands for the radius of the circle of an area equal to that of region g .

Exchange rates are from the CHELEM database for all countries except Belgium-Luxembourg. For the later the exchange rate has been extracted from the NewCronos database. Production data are taken from the CHELEM database (GDP in current USD). Wages have been obtained from the World Bank - UNIDO joint database “Trade and Production”, and from “NewCronos” database of Eurostat. The latter has been used to fill in missing points in the former.

Tariffs have been calculated using Haveman’s database (constructed from UNCTAD’s TRAINS database).¹³ Data on tariffs is obtained from declaring countries. Bulgaria and Slovakia do not appear in this database (even in UNCTAD’s TRAINS database) as declarant countries. Slovakia does not appear even as partner (exporting) country. Due to the large number of missing observations, for each country pair for which data was available for two or more non consecutive years, missing data for years in the gap have been replaced by averages of tariffs for the earliest and the latest years for which data was available:

$$\text{for a one year gap : } \text{Tariff}_{i+1} = (\text{Tariff}_i + \text{Tariff}_{i+2})/2;$$

$$\begin{aligned} \text{for a two year gap : } \text{Tariff}_{i+1} &= (2\text{Tariff}_i + \text{Tariff}_{i+3})/3, \text{ and} \\ \text{Tariff}_{i+2} &= (\text{Tariff}_i + 2\text{Tariff}_{i+3})/3. \end{aligned}$$

This procedure permitted to increase the number of observations from 1150 to 2310.

Tariffs are supplied in Haveman’s database at a very detailed level (tariff lines, using the Harmonized System six digits classification HS6). Since other data as production, wages, and even trade use significantly less detailed classifications, tariff data need to be aggregated to corresponding levels. The only possible weight one can use¹⁴ is the value of imports for each HS6 position (tariff line). But it is straightforward that there is a strong and negative correlation between the value of tariffs and the value of imports. To minimize

¹²This procedure was introduced by Helliwell and Verdier (1997) and is also used by Head and Mayer (2000).

¹³I would like thank Soledad Zindago (CEPII) for the precious help with the extraction and the processing of this data.

¹⁴from the point of view of availability of data.

the endogeneity bias and still account for the different importance of each product in international trade, we follow A.Bouët, L.Fontagné, M.Mimouni and X.Pichot (2001) and weight the tariff protection of each importing country by the imports of countries in the study from all partners.

The Index of Economic Freedom and its ten component indexes have been obtained from the Heritage Foundation. This index is measured only since 1995, implying a reduction of the time range of the data. Additional continuous institutional measures have been obtained from the World Development Indicators (the World Bank).

5 Estimation and Results

We turn now to the estimation of our main equation (11) with panel technics.

$$\ln \frac{m_{ij}}{m_{jj}} = \alpha_1 \frac{y_i}{y_j} - \alpha_2 \ln \frac{w_i}{w_j} - \alpha_3 \ln \frac{d_{ij}}{d_{jj}} - \alpha_4 \ln (1 + t_{ij}) - \alpha_5 \ln \frac{S_i}{S_j} + \alpha_6 (S_i - S_j)^2 + \epsilon_{ij} \quad (15)$$

The main problem that we face here is to find good measures of the quality of national institutions. There are multiple measures for institutions' quality: EBRD indexes on legislation, level of privatisation, fiscal reform, etc, Freedom House country ratings, Euromoney country risk index, World Banks Development Indicators, ICRG risk ratings, BERI index of contract enforceability.

At the beginning we would like to use a single measure for the institutional quality, a single index that incorporates different aspects of countries institutional frameworks, in order to have a rough comparison of its importance versus that of tariffs. We use for that the Index of Economic Freedom (table 5). This index associates economic freedom to a state of acts where unnecessary and abusive constraints, government coercions and impediments to economic activity are inexistant. It includes a broad array of institutional factors, such as corruption, fiscal burden of government, the rule of law, regulatory burdens, restrictions on banking and financial services, labour market regulations, black market activities. A high score, i.e. a low economic freedom, indicates high barriers for the general economic activity imposed by the institutional framework, and is therefore equivalent to poor functioning of national institutions. Estimates of all coefficients have the expected sign. The low significance of the IEF ratio is compensated by the high estimated absolute value of the difference in institutional scores of the importing and the exporting countries, suggesting that similarity in institutional level is more important. This result is not surprising, for only transition countries' trade with EU membres is considered here. National institutions function better inside the European Union. Thus, an increase in similarity for CEE countries necessarily induces improvement of their institutional framework. One could even conclude that building institutions according to EU standards will increase trade of respective transition countries more than trade liberalization. Table 5 estimates also show that the importance of tariffs is somewhat reduced and the role of institutions is increased after 1995. Both tariffs and institutions do not seem to significantly contribute to the explication of the border effects puzzle. These results only show that good institutions have a positive impact on trade, confirming previous findings in the literature.¹⁵ It would be useful to have a better understanding of the way institutions affect trade. It is much easier to say that improvements in the functioning of institutions

¹⁵Anderson and Marcouiller (2002), OTHERS CITE HERE.

Table 2: Model estimates, institutions measured by Index of Economic Freedom

Explained variable: $\ln(m_{ij}/m_{jj})$				
Variables	GLS 1995-2000	GLS 1996-2000	GLS 1995-2000	GLS 1996-2000
$\ln(y_i/y_j)$	0.68 19.66	0.69 19.70	0.67 19.71	0.62 22.03
$\ln(w_i/w_j)$	-0.10 -2.52	-0.11 -2.68	-0.04 -1.06	-0.02 -0.49
$\ln(d_{ij}/d_{jj})$	-0.91 -9.15	-0.90 -9.12	-0.93 -9.38	-0.84 -8.56
$\ln(1 + t_{ij})$	-2.00 -3.49	-1.91 -3.23		
IEF_i/IEF_j	-0.10 0.73	-0.13 0.91		
$(IEF_i - IEF_j)^2$	-3.15 -3.71	-3.34 -3.91		
Intercept	-4.17 -20.85	-4.16 -17.57	-4.24 -20.85	-4.17 -20.53
Number of observations	1504	1344	2772	1848
R-squared	0.71	0.70	0.68	0.71

t-statistic reported below estimates.

will be positively reflected on trade. It is much harder to identify specific measures or policies that will cause such an amelioration of institutional frameworks. This is mainly due to the high variety of regulations and physical institutions that share a country's institutional framework.

In order to identify specific measures we need to control for different aspects of the broad institutional framework. We do so by desegregating the IEF measure into ten indexes, each measuring one institutional dimension. As in the case of the IEF, higher scores imply lower quality of institutions, which according to our model should impede trade.

Estimates of (15) with S standing for the 10 factors measured by the IEF are reported in tables 5. Since the 10 indexes measuring the "freeness" of the institutional framework include one on trade policy, it is possible that it interacts with the tariff variable. Hence, estimates are reported for the case when the former is excluded from the estimated equation (table 5 columns 3 and 4). Better estimates are found with feasible generalized least squares. (The Breusch and Pagan Lagrangian multiplier test suggests that GLS are to be preferred to OLS estimates.) Of all institutional dimensions measured by the 10 freedom indexes, the ones that seem to matter the most are the Fiscal Burden of Government, Capital Flows and Foreign Investment, and Property Rights. Thus, lower taxes, lower restrictions on foreign capital flows and investment, and proper functioning of the judicial system all boost the trade of Central and East European countries with the European Union. Positive coefficients on indexes measuring the level of freedom of the banking and financial sectors, the rule of law (Property Rights), and of the black market are associated with multicollinearity in the data.¹⁶ Once again one can observe a drop in the importance of tariffs for CEE-EU trade in the second half of 1990s. Squared absolute differences in institutional measures between the importing and the exporting countries almost always (when estimates are significantly different from zero) enter the equation with the right negative sign. The reduction of border effects when controlling for the ten institutional dimensions, compared to estimates of the "raw" border effects model (columns 3 and 4 in table 5), is still unsatisfactory. Nevertheless, these estimates may be subject to important endogeneity problems. Moreover, index measures that were used above share some common shortcomings with all qualitative variables. First, they allow for lower variation across countries than continuous variables, and have both an upper and a lower limit. Therefore, it is much harder to tell to what exactly corresponds an improvement of institutional quality with say one point (e.g. passing from an IEF of 3.0 to an IEF of 2.0). Second, they rely at least partially on subjective reasoning upon which indexes are constructed. All these problems can be avoided by using continuous variables to measure institutions' quality.

While unable to find continuous instruments for all the ten dimensions measured by the IEF index used above, we identify four continuous variables that measure certain aspects of the institutional framework. These variables account for the quality of some of the dimensions that have been revealed to exercise a high impact on trade. We use the part of taxed revenue in GDP to account for the fiscal burden of government and restrictions on capital flows and foreign investment, the size of the banking sector for the banking and financial sector, and credits to private sector for government's intervention in

¹⁶Black Market is highly correlated to Monetary Policy and Property Rights, Regulation is highly correlated to Banking and Finance. To deal with it we use instruments for Monetary Policy and Banking and Finance.

Table 3: Model estimates, institutions measured by 10 IEF factors

Explained variable: $\ln(m_{ij}/m_{jj})$	GLS	FGLS ⁺	GLS	FGLS ⁺	FGLS ⁺	FGLS ⁺
	years 1995-2000				1995	1996-2000
$\ln(y_i/y_j)$	0.70	0.75	0.70	0.75	0.79	0.75
$\ln(w_i/w_j)$	20.11	65.51	20.22	64.19	59.44	45.63
$\ln(d_{ij}/d_{jj})$	-0.07	0.03	-2.08	0.04	-0.02	-0.03
$\ln(1 + t_{ij})$	-1.72	1.42	-1.93	1.89	-0.47	-1.33
Trade Policy	-0.99	-1.15	-0.97	-1.12	-1.76	-1.04
Fiscal Burden of Government	-10.66	-46.66	-10.55	-44.03	-52.44	-40.46
Government Intervention in the Economy	-2.20	-2.31	-2.32	-1.23	-4.20	-1.43
Monetary Policy	-3.52	-3.91	-2.88	-2.25	-7.40	-2.26
Capital Flows and Foreign Investment	-0.03	-0.17				
Banking and Finance	-1.11	-5.78				
Wages and Prices	-0.08	-0.60	-0.05	-0.54	-0.93	-0.55
Property Rights	-0.84	-7.14	-0.55	-6.04	-7.81	-5.56
Regulation	-0.06	0.09	-0.07	0.07	0.02	0.04
Black Market	-1.42	2.40	-1.55	1.95	0.56	0.92
Diff in Trade Policy	0.01	-0.02	0.02	-0.03	-0.14	-0.04
Diff in Fiscal Burden of Government	0.73	-0.85	0.92	-1.40	-5.93	-1.95
Diff in Government Intervention in the Economy	0.05	-0.38	0.04	-0.48	-0.65	-0.46
Diff in Monetary Policy	0.75	-6.45	0.66	-8.87	-7.70	-8.38
Diff in Capital Flows and Foreign Investment	0.06	0.27	0.06	0.25	-0.18	0.28
Diff in Banking and Finance	1.49	9.37	1.46	8.65	-6.34	9.82
Diff in Wages and Prices	-0.03	-0.11	-0.03	-0.10	-0.25	-0.16
Diff in Property Rights	-0.30	-2.75	-0.31	-2.50	-2.97	-3.64
Diff in Regulation	0.06	0.45	0.05	0.47	0.58	0.43
Diff in Black Market	1.13	12.35	0.80	13.12	8.19	12.71
Diff in Trade Policy	0.10	0.09	0.10	0.01	0.43	0.04
Diff in Fiscal Burden of Government	2.27	2.07	2.21	0.32	10.92	0.98
Diff in Government Intervention in the Economy	0.05	0.08	0.05	0.09	0.05	0.08
Diff in Monetary Policy	2.09	3.65	2.12	3.88	1.82	2.98
Diff in Capital Flows and Foreign Investment	-0.01	0.02				
Diff in Banking and Finance	-0.98	2.82				
Diff in Wages and Prices	0.04	0.13	0.03	0.12	0.16	0.13
Diff in Property Rights	2.37	8.98	2.25	8.11	9.10	8.23
Diff in Regulation	-0.02	-0.04	-0.02	-0.04	-0.04	-0.03
Diff in Black Market	-2.86	-5.84	-2.90	-5.47	-7.40	-3.60
Diff in Trade Policy	0.00	0.06	-0.00	0.06	0.13	0.05
Diff in Fiscal Burden of Government	0.22	16.31	-0.20	16.35	28.08	13.85
Diff in Government Intervention in the Economy	-0.04	-0.08	-0.05	-0.07	-0.21	-0.03
Diff in Monetary Policy	-1.89	3.97	-2.10	-3.35	-6.59	-1.47
Diff in Capital Flows and Foreign Investment	-0.03	-0.05	-0.03	-0.04	-0.03	-0.05
Diff in Banking and Finance	-2.27	-5.03	-2.31	-4.66	-2.93	-5.87
Diff in Wages and Prices	-0.04	-0.14	-0.04	-0.14	-0.05	-0.13
Diff in Property Rights	-1.01	-9.10	-0.98	-8.83	-2.85	-8.19
Diff in Regulation		-0.06	0.00	-0.07	-0.06	-0.08
Diff in Black Market		-7.98	0.28	-8.98	-6.84	-9.72
Diff in Trade Policy	-0.05	-0.05	-0.02	-0.04	-0.04	-0.04
Diff in Fiscal Burden of Government	-3.16	-4.74	-3.21	-4.28	-4.28	-3.53
Diff in Government Intervention in the Economy	-0.02	0.01	-0.02	0.01	-0.00	0.02
Diff in Monetary Policy	-3.97	2.60	-3.86	2.73	-0.62	3.78
Diff in Capital Flows and Foreign Investment	-4.04	-3.86	-4.05	-3.95	-2.59	-3.99
Diff in Banking and Finance	-16.14	-31.87	-16.25	-31.60	-10.85	-30.90
Intercept						
Number of observations	1504	1504	1504	1504	160	1344
R-squared	0.72		0.72			
Breusch and Pagan Lagrangian	$\chi^2(1)=2073.11$		$\chi^2(1)=2096.14$			
multiplier test for random effects	Prob> $\chi^2=0.000$		Prob> $\chi^2=0.000$			

⁺ FGLS with heteroscedastic panels. *t*-statistic reported below estimates.

the economy. We also use the real interest rate to measure other aspects of institutional quality. These variables enter the model with expected signs⁴(table 5). Lower interest

Table 4: Model estimates, institutions measured by WDI variables

Explained variable: $\ln(m_{ij}/m_{jj})$				
	FGLS+	FGLS+	FGLS+	FGLS+
	1993-2000	1993-2000	1993-2000	1996-2000
$\ln(y_i/y_j)$	0.66	0.69	0.64	0.71
	48.71	50.80	37.63	53.41
$\ln(w_i/w_j)$	-0.06	-0.05	0.01	-0.13
	-3.24	-2.43	0.46	-9.04
$\ln(d_{ij}/d_{jj})$	-0.98	-0.93	-1.16	-0.89
	-29.34	-28.58	-29.91	-23.71
$\ln(1 + t_{ij})$	0.87	0.09	-2.91	-1.27
	1.16	0.13	-3.77	-1.90
Part of taxed revenue in GDP	-0.20	-0.18	-0.21	-0.20
	-7.26	-6.59	-7.08	-6.94
Real interest rate	-0.09	-0.07	0.01	-0.05
	-4.05	-2.43	0.18	-1.76
Size of banking sector	0.10	0.13	0.07	0.17
	2.1	3.00	0.83	3.29
Part of credit to private sector	-0.07	-0.03	-0.13	-0.03
	-1.78	-0.92	-1.83	-0.58
Index of Economic Freedom		0.50		
		4.62		
Diff in Taxed revenue	-0.01	-0.01	-0.00	-0.00
	-4.20	-3.81	-6.53	-1.74
Diff in Real interest rate	0.00	0.01	-0.00	0.00
	1.95	2.97	-1.9	3.59 9
Diff in Size of banking sector	-0.00	-0.00	-0.00	-0.00
	-3.66	-3.06	-1.67	-2.91
Diff in Credit to private sector	0.00	0.00	0.00	0.00
	3.35	1.79	1.28	2.21
Diff in Index of Economic Freedom		5.39		
		8.14		
Intercept	-4.31	-4.82	-4.29	-4.22
	-69.89	-36.67	-60.12	-56.34
Number of observations	927	927	363	564

⁺ FGLS with heteroscedastic panels. *t*-statistic reported below estimates.

rates increase trade probably because many international transactions involve different forms of credits, and lowering the value of that credit one lowers transaction costs. The size of the banking sector plays a similar role: It increases the probability of a firm to obtain a credit, as it indicates the availability of funds. Higher taxed revenues reflect higher taxes and hence make all economic activity, including trade and trade assimilated services costlier. Estimates are robust to the inclusion of the IEF ratio. The difference between importing and exporting country scores has the right sign when significantly different from zero. This finding supports our assumption that similarity of institutions increases trade. Interesting, the estimate on the tariff variable is no longer significant

when the four institutional variables are included. The situation does not change when IEF ratios are included. This permits to conclude that the four institutional variables have a higher impact on trade than tariffs. One could conclude that a CEE country could increase its exports to EU by lowering taxes and interest rate and strengthening its banking sector.

6 Conclusion

We use a trade costs structure with tariffs and institutions in a simple monopolistic trade model. We find that the quality of national institutions, along with trade liberalization measured by import tariffs, has a strong and significant impact on trade between Central and East European countries. This result is confirmed by the use of both index and continuous variables for measuring the functioning of institutions. We also find that the importance of tariffs is significantly reduced in the second half of 1990s. This suggests that future increase in CEE-EU trade is possible even if it reached almost full liberalization.

There are aspects problems that need further investigation: institutions can be also affected by the level of trade. For instance a country may chose to lower restrictions on capital flows from abroad when trade level is low as an optional policy for boosting domestic growth. Differently, a higher level of foreign trade will ease the process of developing the necessary legislation and ensuring its respect. These aspects of two way casuality between trade and institutions may be of high importance and need a separate discussion.

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