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**Working Paper**

## Legal framework as a trade barrier - Evidence from transition countries: Hungarian, Romanian and Slovene examples

HWWA Discussion Paper, No. 201

**Provided in Cooperation with:**

Hamburgisches Welt-Wirtschafts-Archiv (HWWA)

Suggested Citation: de Sausa, José; Disdier, Anne-Célia (2002) : Legal framework as a trade barrier - Evidence from transition countries: Hungarian, Romanian and Slovene examples, HWWA Discussion Paper, No. 201, Hamburg Institute of International Economics (HWWA), Hamburg

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# **Legal Framework as a Trade Barrier – Evidence from Transition Countries: Hungarian, Romanian and Slovene Examples**

**José de Sousa**

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HWWA DISCUSSION PAPER

**201**

Hamburgisches Welt-Wirtschafts-Archiv (HWWA)  
Hamburg Institute of International Economics

**2002**

ISSN 1616-4814

The HWWA is a member of:

- Wissenschaftsgemeinschaft Gottfried Wilhelm Leibniz (WGL)
- Arbeitsgemeinschaft deutscher wirtschaftswissenschaftlicher Forschungsinstitute (ARGE)
- Association d'Instituts Européens de Conjoncture Economique (AIECE)

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**José de Sousa  
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An earlier version of this paper was presented at the HWWA Workshop on Border Regions, Hamburg, June 16-18, 2002. This version benefited from very helpful comments by Marius Brühlhart and other participants at the workshop. Participants at the workshop GDR Economie et Finance Internationales Quantitatives, Bordeaux, June 27-28, 2002 are also to be thanked. Matthieu Crozet, Gérard Duchêne, Mathilde Maurel, Thierry Mayer, and Daniel Mirza provided helpful comments on early versions.

This discussion paper is assigned to the HWWA's research programme "European Integration and Spatial Development".

## **HWWA DISCUSSION PAPER**

**Edited by the Department  
EUROPEAN INTEGRATION**

**Head: Dr. Konrad Lammers**

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## **Abstract**

Using the border effect approach, our paper examines the influence of the legal framework quality of the Central and Eastern European countries on international trade. This approach offers an evaluation of the borders' impact on trade. A market is fragmented when actual trade differs from the trade that would be expected in an economy without border-related barriers. Recent findings have emphasized informal trade barriers as obstacles to trade flows (*Anderson and Marcouiller, 2002; Anderson and Young, 2000; Rauch, 2001*). We introduce different measures of the legal framework quality, which appears as a significant informal trade barrier. Actually, in case of conflict between two trade partners, it proves to be difficult for a given partner to get damages. Therefore, incentives to trade could be reduced.

We adopt and refine the theoretical monopolistic competition model of trade developed by *Head and Mayer (2000)* and estimate it focusing on imports of Hungary, Romania, and Slovenia from European Union (EU) and Central European Free Trade Agreement (CEFTA) countries. We find that legal framework quality appears as a strong determinant of export decisions of EU producers. In the opposite, the CEFTA producers seem to be less or not affected by this quality in their decisions of trade.

**JEL classification:** F12, F15, P20

**Key words:** legal framework, border effects, central and eastern European countries

# 1 Introduction

Contracts govern international trade flows. In specifying mechanisms for decision making and dispute resolution, they are designed to secure relationships. Contracts are maintained by invoking the legal framework (courts, legislation, etc.). But what happens if the extensiveness and effectiveness of the legal framework is relatively weak? Is there an influence on trade patterns?

Intra-European trade offers a stimulating empirical field to address these questions. Our sample built from sectoral imports of Hungary, Romania and Slovenia from European Union (EU) and Central European Free Trade Agreement (CEFTA)<sup>1</sup> countries emphasizes considerable variation in the effectiveness of the legal framework. Actually, transition economies of Central and Eastern Europe have attempted to set up market-oriented legal systems to replace the administered legal control of the old planned economy. However, in spite of large efforts, their legal framework remains relatively weak in the enforcement of contracts, compared to Western European countries. We use this quality variation across countries to test the impact of the legal framework quality on trade over the period 1995-1998.

This article raises also the question of the economic integration of Central and Eastern European Countries (CEECs) to the EU and to the CEFTA. Which process is most advanced? Does one process compete with the other? In contrast, the economic literature on enlargement mainly studies the costs and the benefits of the adhesion to the EU (e.g. Anderson and Tyers, 1995, Baldwin, 1994).

In order to evaluate the process of economic integration and the impact of the legal framework on trade, we use the “border effects” method, which offers an evaluation of the borders’ impact on trade (McCallum, 1995, Helliwell, 1996, Wei, 1996, Wolf, 1997, Head and Mayer, 2000)<sup>2</sup>. Size for size and distance for distance, the trade within a given geographical unity (area, country, etc.) appears higher than that observed with a given external partner. Many studies confirm this observation, as well in Asia<sup>3</sup>, in Eastern Europe<sup>4</sup> or within OECD<sup>5</sup>, particularly in North American<sup>6</sup> and Western European trade<sup>7</sup>.

We base our demonstration on a model of monopolistic competition developed by Head and Mayer (2000) and derived from Dixit and Stiglitz (1977) and Krugman (1980). This approach presents the advantage, while obtaining a specification close to the gravity’s works, to introduce the consumer’s preferences and the tariff and non-tariff barriers in the explanation of border effects. We transform this model by including in the specification the effect of the legal framework quality of the European countries. Two indicators are chosen to give an account of this quality. Our results suggest significant variations in the border effects within the trade of Hungary, Romania and Slovenia with CEFTA and EU countries. The quality of the legal framework seems a significant determinant of trade. Our paper documents the idea that national borders draw the frontier between different legal frameworks, inducing a home bias (Rodrik, 2000, Turrini and van Ypersele, 2002). This is in line with recent findings

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<sup>1</sup>Bulgaria, Hungary, Poland, Czech Republic, Romania, Slovakia and Slovenia are member countries of the CEFTA.

<sup>2</sup>See Helliwell, 1998, and Head and Mayer, 2001, for a literature review of border effects.

<sup>3</sup>Frankel and Wei (1997) and Poncet (2001).

<sup>4</sup>Disdier and Mucchielli (2002), Djankov and Freund (2000) and Fidrmuc and Fidrmuc (2000).

<sup>5</sup>Head and Mayer (2001), Helliwell (1997) and Wei (1996).

<sup>6</sup>Helliwell (1996), Helliwell and McCallum (1995), McCallum (1995) and Wolf (1997, 2000).

<sup>7</sup>Chen (2002), Head and Mayer (2000) and Nitsch (2000).



that emphasize informal trade barriers as obstacles to trade flows (Anderson and Marcouiller, 2002, Anderson and Young, 2000, Rauch, 2001).

The remainder of the paper is organized as follows: in section 2, we study the impact of the legal framework on trade flows. In section 3, we set out the theoretical model and the methodology to calculate internal and external distances. The results are presented in section 4. Finally, we conclude in section 5.

## 2 Weakness of the legal framework

Contracts enforcement requires an efficient *legal framework*. In contrast, a weak legal framework limits contracts enforcement and induces a negative impact on trade (Anderson and Marcouiller, 2002, Anderson and Young, 2000). The following example illustrates the difficulties stemming from a weak legal framework. An EU exporter draws up a sale contract with an importer from central Europe. The contract stipulates that any complaint is judged by the courts of the importing country<sup>8</sup>. Assuming that the legal framework of the importing country is insufficient to make respect the contract, it follows that the exporter is not incited to trade anymore. Actually, in case of trade conflict, ensuing from an opportunistic behavior, the exporter will have difficulties in obtaining damages. This example underlines the role of the importing country's legal framework. However, the weakness of the legal framework of an exporting country generates similar problems. For instance, a central European exporter draws up a sale contract with an EU importer. The contract stipulates now that any complaint is judged by the courts of the exporting country. It results that the importer is not incited to trade anymore. For instance, if an importer pays in advance the amount of the order and receives a defective batch, it has any legal recourse to settle the disagreement.

In the CEECs, is the legal framework sufficient to guarantee the respect of contracts?

Since the systemic change, CEECs make significant efforts to improve their legal framework. They set up a very complete legal regulation. Moreover, the enlargement prospect with the EU obliges them to harmonize their legal framework with the 'acquis communautaire'. In spite of these efforts of harmonization and development, the CEECs' legal framework remains relatively weak in the enforcement of contracts, compared to more developed countries. This stylized fact, documented by several cross-country studies and authors (EBRD, 2000, Johnson, McMillan and Woodruff, 2002), proves to be valid in spite of considerable variation across CEECs. Hungary, for instance, is one of the most advanced countries in the transition process. Despite everything, Hungarian courts encounter great difficulties of applying laws (Papanek and Malatinszky, 1999). On the one hand, the companies' legislation includes a significant number of internal contradictions, inaccuracies and lacks. It is often altered and amended. On the other hand, justice misses competencies, means and qualifications. Besides, the legal procedures are complex and long.

This stylized fact has a direct implication: the weakness of the legal framework induces a weak contract enforcement. Thus, whatever the precision of the contract, the court encounters difficulties of implementing the contractual clauses. Consequently, it appears superfluous to write a complete contract<sup>9</sup>. The contract is necessarily incomplete.

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<sup>8</sup>Resorting to an international arbitration occurring in a third country is possible but quite costly (Casella, 1992, 1996).

<sup>9</sup>"A 'complete contract' is a contract that has the relevant decisions (transfer, trade, etc.) depend on all

Which types of problems the contractual incompleteness does it generate?

Given that international trade induces some sunk costs (Bernard and Wagner, 2001, Roberts and Tybout, 1997), the relevance of signing a contract is to determine, before producing, the price of the exchanged good. The contract thus offers a certain safety, a *statu quo* position. It guarantees to the investor his investment returns. But, as the contract is incomplete, certain variables remain indeterminate, like investments, which are not completely specified at the signing of the contract. This indetermination influences the parties' payoff. Thus, the agents leave future outcomes open to future renegotiation.

However, bargaining is a risky process. A dissension on the price renegotiation can involve a contractual rupture, which generates an economic loss. The costs being sunk, the parties do not secure a return on their investments. Nevertheless, the rupture of the relation does not produce any damage if agents find alternative partners.

Some factors however limit the recourse to outside options. A first factor is the assumption of an expensive search for new foreign partners. This cost restricts the number of possible alternatives. Consequently, Anderson and Marcouiller (2002) and Anderson and Young (2000) assume that each agent only trades with one foreign partner. Since the absence of outside options increases risks, partners are not encouraged to trade. Yet, the assumption of an expensive search for new foreign partners is somewhat debatable given that the search for domestic partners is carried out without cost.

A second factor is the significance of relationship-specific assets in international trade, in particular on the exchange of intermediate goods. Some industrial sectors (electronics, automobile, etc.) produce complex goods, which are split up into several stages of production. Each stage of production develops a certain specificity, since the product is customized. This specificity restricts the recourse to an outside option (Williamson, 1975). For example, when the product is tailored to meet the importer requirements, the exporter is constrained to carry out relationship-specific investments (acquisition of a particular machine, etc.). These specific investments have a low value out of the relation. Thus, the exporter depends on the importer's orders. However, the importer is also related to the exporter insofar as the specificity of purchase limits the recourse to an alternate salesman. Consequently, more the degree of specificity is raised, more the partners are "locked in" the relation. The lock-in effect supports opportunist behaviors and hold-up problems limiting the incentives of the agents to invest and trade.

The objective of this paper is to stress the importance of the legal framework quality in international trade. As previously mentioned, a weak legal framework acts like an informal trade barrier. We try to emphasize this point starting from the methodology of the border effects.

## 3 Theoretical model and measurement of distances

### 3.1 Equation to estimate

Suppose an exchange system with  $K = (1, \dots, k)$  countries where  $i \in K$  refers to the importer country and  $j \in K$  to the exporter country. The utility function of the representative consumer

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verifiable variables, including announcements by the parties (concerning their valuation, cost, etc.)." (Tirole, 1988: 29).

of country  $i$  is at constant elasticity of substitution  $\sigma$  (CES). Transport costs  $\omega_{ij}$  between country  $j$  and country  $i$  are function of distance between the two trade partners ( $\omega_{ij} = d_{ij}^\delta$ ). Note that to simplify matters, bilateral flows are divided by internal flows. Thus following Head and Mayer (2000), we obtain:

$$\ln\left(\frac{m_{ij}}{m_{ii}}\right) = \ln\left(\frac{v_j}{v_i}\right) - (\sigma-1)\delta \ln\left(\frac{d_{ij}}{d_{ii}}\right) - \sigma \ln\left(\frac{p_j}{p_i}\right) - (\sigma-1)(\alpha + \ln(1 + TB_{ij} + NTB_{ij})) + e_{ij} \quad (1)$$

where  $e_{ij} = (\sigma - 1)(\epsilon_{ij} - \epsilon_{ii})$ .

$m_{ij}$  are the imports of  $i$  from  $j$  and  $m_{ii}$  the imports of  $i$  from itself. To calculate  $m_{ii}$ , we refer to Wei's (1996) method. Wei defines the country's imports from itself as the difference between its total production and its total exports.  $\nu_j$  (respectively  $\nu_i$ ) is the production of  $j$  (respectively of  $i$ ), and  $p_j$  (respectively  $p_i$ ) is the production price of  $j$  (respectively of  $i$ ). Lastly,  $d_{ij}$  and  $d_{ii}$  are the external and internal distances.

The estimation of this equation gives a measure of border effects affecting the bilateral trade of countries  $i$  and  $j$ . These effects are included in the constant of equation. The constant captures both the aversion of consumers of country  $i$  for goods of country  $j$  ( $\alpha$ ), and the tariff ( $TB_{ij}$ ) and non-tariff barriers ( $NTB_{ij}$ ) applied by country  $i$  on its imports from country  $j$ .

The home bias could potentially be reduced by the two following elements: the signing of an association agreement with the EU or an adhesion agreement with the CEFTA ( $AA_{ij}$ ), and the sharing of a border ( $CB_{ij}$ ). After the inclusion of  $AA_{ij}$  and  $CB_{ij}$ , equation (1) becomes:

$$\begin{aligned} \ln\left(\frac{m_{ij}}{m_{ii}}\right) &= \ln\left(\frac{v_j}{v_i}\right) - (\sigma-1)\delta \ln\left(\frac{d_{ij}}{d_{ii}}\right) - \sigma \ln\left(\frac{p_j}{p_i}\right) - (\sigma-1)(\alpha + \ln(1 + TB_{ij} + NTB_{ij})) \\ &\quad + (\sigma-1)(\lambda AA_{ij} + \eta CB_{ij}) + e_{ij} \end{aligned} \quad (2)$$

where,

$$e_{ij} = (\sigma - 1)(\epsilon_{ij} - \epsilon_{ii});$$

$AA_{ij} = 1$  if an association or an adhesion agreement between countries  $i$  and  $j$  is signed and 0 otherwise;

$CB_{ij} = 1$  if countries  $i$  and  $j$  share a border and 0 otherwise.

We consider that the signing of an agreement shows two countries' willingness to develop their mutual trade. Consequently to determine the  $AA_{ij}$  value, we refer to the date of signing and not to the date of coming into force. Recall that our study covers the period 1995-1998. So, if an agreement is signed during one of these years, we apply the following share rule:  $AA_{ij} = 1$  if the signing happens before the middle of the year and 0 if the signing is reached after. From this year onwards,  $AA_{ij}$  takes a value of 1.

The home bias could also be affected by the introduction of a measure of the legal framework quality. Let  $LF_i$  denote the legal framework of the importing country and  $LF_j$  the legal framework of the exporting country.  $LF_i$  and  $LF_j$  are two polytomic variables. This does make the size of their effects difficult to interpret. In order to overcome this problem, we

build a dummy variable for each level of  $LF_i$  and  $LF_j$ . After the inclusion of  $LF_i$  and  $LF_j$ , equation (2) becomes:

$$\ln\left(\frac{m_{ij}}{m_{ii}}\right) = \ln\left(\frac{v_j}{v_i}\right) - (\sigma - 1)\delta \ln\left(\frac{d_{ij}}{d_{ii}}\right) - \sigma \ln\left(\frac{p_j}{p_i}\right) - (\sigma - 1)(\alpha + \ln(1 + TB_{ij} + NTB_{ij})) + (\sigma - 1)(\lambda AA_{ij} + \eta CB_{ij} + \phi LF_i + \psi LF_j) + e_{ij} \quad (3)$$

where  $e_{ij} = (\sigma - 1)(\epsilon_{ij} - \epsilon_{ii})$ .

We derive also a specification including a “relative legal framework” variable, as follows:

$$\ln\left(\frac{m_{ij}}{m_{ii}}\right) = \ln\left(\frac{v_j}{v_i}\right) - (\sigma - 1)\delta \ln\left(\frac{d_{ij}}{d_{ii}}\right) - \sigma \ln\left(\frac{p_j}{p_i}\right) - (\sigma - 1)(\alpha + \ln(1 + TB_{ij} + NTB_{ij})) + (\sigma - 1)(\lambda AA_{ij} + \eta CB_{ij} - \xi \frac{LF_j}{LF_i}) + e_{ij} \quad (4)$$

where  $e_{ij} = (\sigma - 1)(\epsilon_{ij} - \epsilon_{ii})$ .

## 3.2 Measurement of internal and external distances

The estimation of border effects requires a measurement of two distances: the internal distance and the external distance. The internal distance can be defined as “the distance of a country from itself” (Head and Mayer, 2001). The external distance is the one between the country and each of its partners.

As the distance effect is controlled in the estimation, the measurement of these two distances must be precise. Two specific elements should be carefully considered for the measurement: the consistency of both measures and the economic geography of the countries.

### 3.2.1 Consistency of the measures

External distance is defined in most studies as the distance between the capitals of both partners. The estimation of internal distance is more complex. Many proposals have been made: quarter of the distance between the economic center of the country and the nearest foreign one (Wei, 1996), distance between the two main cities of the country (Wolf, 1997), disk methodology<sup>10</sup> (Leamer, 1997, Nitsch, 2000). In these approaches, two different methods are used for the calculation of internal and external distances. However, an overestimation of internal distance with respect to external distance generates an underestimation of the effect of the distance, and therefore an overestimation of the home bias. Our approach enables us to calculate both external and internal distances using the same methodology.

### 3.2.2 Importance of the economic geography

Economic activity is unequally distributed throughout the country. Besides, in the papers, which defining external distance as the distance between economic centers of both partners,

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<sup>10</sup>This method assumes that the country’s area could be approximate with a disk of same area. Consumers are uniformly distributed on this disk, whereas producers are concentrated in the center.

economic activity is supposed implicitly to be located only in the center. To solve this problem, Head and Mayer (2000) define external distance as the sum of the bilateral distance between the regions centers of the countries. These distances are weighted by the economic size of the regions. The share of the population living in the region approximates this size<sup>11</sup>.

For our distance measurement, we lean out on this approach. The internal and external distances are drawn up as the sum of bilateral distances between regions weighted by the share of the population of each region. Considering  $g_i$  regions of country  $i$  and  $g_j$  regions of country  $j$ , bilateral distance is given by:

$$d_{ij} = \sum_{g_j} (\sum_{g_i} O_{g_i} d_{g_i g_j}) O_{g_j} \quad (5)$$

Where  $O_{g_i} = \frac{POP_{g_i}}{POP_i}$  and  $O_{g_j} = \frac{POP_{g_j}}{POP_j}$  (denoting *POP* the population).

The intra-regional distances are determined with the disk methodology. Following this method, the internal distance of a region is proportional to the square root of its area. We choose as coefficient 0.376 (Head and Mayer, 2000)<sup>12</sup>. Thus, the internal distance of a region is:

$$d_{ii} = 0.376\sqrt{S} \quad (6)$$

Where  $S$  is the surface area of the region.

Head and Mayer (2000) refer to the latitude and longitude of cities to determine the bilateral distance between the centers of regions. However, such an approach does not take into account the state of the relief, and above all the infrastructures availability. So, as to include these elements, we consider distances by road, and retain the fastest one. This distance is the one covered by using the best roads. These roads allow a bigger speed. Note that the fastest distance is not necessarily the shortest one.

## 4 Results

Does the weaker development of the legal framework in CEECs compared to the EU countries affect trade flows? Do the EU and CEFTA producers perceive this influence similarly? Do the legal frameworks of the importing and exporting countries have the same effect on trade?

Table 1 summarizes the results of border effects estimations affecting the trade of Hungary, Romania, and Slovenia with EU and CEFTA countries using the “extensiveness and effectiveness of legal reform” EBRD indicator. This indicator is available only since 1995. Thus, our study covers the period 1995-1998. Data are pooled and measures of border effects are carried out with ordinary least squares (OLS) regressions. The heteroscedasticity is corrected with the White’s (1980) method.

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<sup>11</sup>Because of the very weak variation of the regional population over time, we consider only one year (the year 1996) for the weighting. When regional GDP is used as weight instead of population, the results are quasi-identical (Head and Mayer, 2001). Note that the regional GDP also change very little over time.

<sup>12</sup>The proportionality coefficients defined by the authors using this method differ: Head and Mayer (2000) suggest 0.376, Leamer (1997) uses 0.667, and Nitsch (2000) opts for two values: 0.2 and 0.6.

Table 1: Measure of border effects using the “extensiveness and effectiveness of legal reform” EBRD indicator

Sample :	Dep. Variable: Ln of relative trade					
	whole sample	whole sample	whole sample	whole sample	whole sample	whole sample
Model :	(1)	(2)	(3)	(4)	(5)	(6)
Border effect	-3.448 <sup>a</sup> (0.179)	-2.772 <sup>a</sup> (0.237)	-3.564 <sup>a</sup> (0.174)	-3.589 <sup>a</sup> (0.215)	-3.409 <sup>a</sup> (0.320)	-3.763 <sup>a</sup> (0.351)
Ln relative production	1.071 <sup>a</sup> (0.025)	1.256 <sup>a</sup> (0.050)	-	1.113 <sup>a</sup> (0.042)	1.174 <sup>a</sup> (0.046)	1.109 <sup>a</sup> (0.038)
Ln relative price	-0.260 <sup>a</sup> (0.028)	-0.332 <sup>a</sup> (0.034)	-0.230 <sup>a</sup> (0.025)	-0.194 <sup>a</sup> (0.034)	-0.428 <sup>a</sup> (0.049)	-0.448 <sup>a</sup> (0.053)
Ln relative distance	-1.384 <sup>a</sup> (0.063)	-1.825 <sup>a</sup> (0.121)	-1.318 <sup>a</sup> (0.064)	-1.244 <sup>a</sup> (0.108)	-2.081 <sup>a</sup> (0.141)	-1.840 <sup>a</sup> (0.132)
Common border	0.971 <sup>a</sup> (0.097)	0.867 <sup>a</sup> (0.100)	0.996 <sup>a</sup> (0.096)	1.021 <sup>a</sup> (0.101)	0.644 <sup>a</sup> (0.110)	0.738 <sup>a</sup> (0.121)
Association or free trade agreement	0.775 <sup>a</sup> (0.093)	0.628 <sup>a</sup> (0.098)	0.814 <sup>a</sup> (0.092)	0.751 <sup>a</sup> (0.099)	0.491 <sup>a</sup> (0.109)	0.514 <sup>a</sup> (0.108)
Fixed time effects year 1995	-	-	-	-	-	-
Fixed time effects year 1996	-0.166 <sup>c</sup> (0.098)	-0.171 <sup>c</sup> (0.098)	-0.178 <sup>c</sup> (0.098)	-0.255 <sup>a</sup> (0.101)	-0.417 <sup>a</sup> (0.122)	-0.420 <sup>a</sup> (0.123)
Fixed time effects year 1997	0.093 (0.098)	0.100 (0.097)	0.087 (0.098)	-0.012 (0.101)	-0.148 (0.122)	-0.151 (0.123)
Fixed time effects year 1998	0.257 <sup>b</sup> (0.111)	0.264 <sup>b</sup> (0.111)	0.251 <sup>b</sup> (0.117)	-0.095 (0.116)	-0.062 (0.125)	-0.096 (0.127)
Ln relative infrastructure						-0.372 <sup>c</sup> (0.213)
Ln relative legal framework				-0.938 <sup>a</sup> (0.152)		
Importer legal framework rated 2					Ref. var.	Ref. var.
Importer legal framework rated 3					1.161 <sup>a</sup> (0.168)	1.064 <sup>a</sup> (0.166)
Importer legal framework rated 4					1.326 <sup>a</sup> (0.149)	1.417 <sup>a</sup> (0.174)
Exporter legal framework rated 2					Ref. var.	Ref. var.
Exporter legal framework rated 3					0.298 (0.222)	0.214 (0.226)
Exporter legal framework rated 4					0.285 (0.209)	0.215 (0.215)
Exporter legal framework rated 5					1.107 <sup>a</sup> (0.268)	0.965 <sup>a</sup> (0.278)
Mills Ratio		5.691 <sup>a</sup> (1.361)	-0.188 (0.681)	0.465 <sup>a</sup> (1.068)	4.036 <sup>a</sup> (1.221)	2.125 <sup>a</sup> (0.902)
Observations	3354	3354	3354	3354	3354	3354
R <sup>2</sup>	0.445	0.445	0.270	0.451	0.464	0.463

Notes: Standard errors in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively denoting significance at the 1%, 5% and 10% levels. In column (3) a unit elasticity is imposed on relative production by passing it to the left hand of the regression equation.

In the three first columns, we proceed to an estimation of the border effects without taking into account the legal framework quality. In column (2), we use Heckman’s two-stage procedure<sup>13</sup> to address the potential selection bias implied by the observations of zero flows. In column (3), following Head and Mayer’s (2000) approach, we test the potential risk of endogeneity of the production variable. We impose a unit coefficient on relative production, by moving this variable from the right to the left-hand side of the equation.

The overall fit of the estimations is globally in line with the existing comparable papers studying border effects. The different estimated coefficients have the expected signs and magnitudes and are significant at the 1% level, except for the time dummies.

In column (1), the border effect is of 31.43 [ $\exp(3.448)$ ]; Hungary, Romania, and Slovenia therefore trade on average 31 times more with themselves than with an EU or a CEFTA country of similar size and distance. Distance has a negative effect on bilateral trade, and this effect is relatively strong: an increase of 1% of the distance generates a decrease of the bilateral trade of 1.384%. Trade flows are positively influenced by the sharing of a border and by the signing of an association agreement with the EU and the entry into the CEFTA. The estimated coefficient on the common border variable is of 0.971, and the one on the association variable is of 0.775. Besides, the relative production coefficient is close to its theoretical unit value. Coefficients of time dummies are less significant than other variables but their signs deserve attention. Actually, we note opposite signs: negative for the “Year 1996” ( $p < 0, 10$ ) and positive for the “Year 1998” ( $p < 0, 05$ ). This suggests a positive influence of the transition process on trade patterns.

In column (2), the Mills Ratio is significant ( $p < 0, 01$ ). Then, Heckman’s procedure will be applied to all estimations to correct for the selection bias. The results point out a weaker border effect. On the other hand, the estimated coefficient on distance is larger. This is in accordance with the fact that zero flows are essentially registered with the EU countries geographically far from CEFTA countries (firstly Portugal and Ireland and in a minor degree Scandinavian countries). The correction of the selection bias increases the magnitude of the relative production coefficient. We test a potential endogeneity of the relative production variable (column 3). The results indicate in particular a stronger border effect than in column (1).

In the last three columns, we include measures of the legal framework. The annual EBRD survey rates the “extensiveness and effectiveness of legal reform” in CEECs on a scale going from 1 to 4+, 1 representing the worst rating and 4+ the best one (see appendix 2 for a detailed description). In our sample, not all ratings are assigned to CEECs: only 2, 3 and 4 are used for both importer and exporter). The EBRD considers EU countries as reference countries and assigns to each one a rating of 5. In column (4), we include the rating of the exporter legal framework quality (henceforth  $x_{legal}$ ) relative to the one of the importer country (henceforth  $m_{legal}$ ). In column (5), we introduce ratings of both partners separately to distinguish the influence of the importer and exporter legal framework quality on trade. Each rating is defined as a dummy variable. Econometrically, the interpretation of estimated

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<sup>13</sup>Controlling for the selection bias resulting of the potential endogeneity of the countries combinations, for which the observed flows are null, we initially estimate a probit in which the dependant variable is 1 for a positive flow and 0 for a null flow. The explanatory variables are those of equation 2, except for “common border”, and the same variables in level. The Mills ratio, calculated with the coefficients of the probit, is then introduced in the estimation of the equation 2. The set of explanatory variables is changing depending on the estimated equation.

coefficients of these variables should be done comparatively to the reference variable. For example, assume the rating of 2 as the reference variable. A significant and positive coefficient on the rating of 3 suggests that a higher quality of legal framework influences positively the exchanges. In order to simplify, the reference variable always represents the worst category in the estimations<sup>14</sup>. The variables “mlegal” and “xlegal” are not perfect predictors of the “extensiveness and effectiveness of legal reform” in CEECs. They can capture differences of development among countries. In consequence, we include, in column (6), the variable “ln relative infrastructure”, measuring the quality of infrastructure of the exporter country relative to the one of the importer country.

Assigning a rating of 5 to each EU country can induce a bias. In Table 6 (see appendix 1), we undertake this problem by including EU exporter dummies to the specification. In consequence, the variable “xlegal” rated 5 is dropped and we get the influence of the EU countries. It is worth noting that just Portugal has a significant and negative coefficient.

In column 4 of table 1, the variable “ln relative legal framework” has a negative coefficient. Therefore, the existence of a gap in terms of legal framework quality between the exporter and importer countries has a negative impact on trade. The results, in columns 5 and 6, show that the legal framework quality of the importer country influences positively and significantly trade. When “mlegal” rated 2 is the reference variable, the estimated coefficients on mlegal3 and mlegal4 are positive and significant, and as expected, coefficient on mlegal4 is larger than the one on mlegal3. The impact of the legal framework quality of the exporter country appears more ambiguous: this impact is significant only for a rating of 5<sup>15</sup>. These results are consistent with the idea that is the exporter that bears the highest costs for dealing with across-the-border disputes (Turrini and van Ypersele, 2002: 4). The exporter takes into account the legal framework quality of the importer’s country in his export decision.

The coefficient on infrastructure is significant at the 10% level and negative (column 6). This means that a gap in terms of infrastructure quality between partners has a negative impact on trade. Note that the introduction of this variable does not change substantially the coefficients and magnitudes of “mlegal” and “xlegal”, which capture a different problem.

Our sample includes two groups of exporter countries (EU and CEFTA countries). A different legal framework quality between these two groups could generate biased estimations. In order to test this hypothesis, we proceed to separated estimations in table 2: including the whole sample (columns 1 and 2), only EU countries (columns 3 and 4) and only CEFTA countries (columns 5 and 6). All estimations are realised while keeping just “mlegal” variables<sup>16</sup>. In specifications (2), (4) and (6), we remove fixed time effects in order to control for multicollinearity. In fact, “mlegal” can be collinear with the year dummies included in the regression. We check if “mlegal” is only changing over each year and not across panel (see table 7 in appendix 1 for pair-wise correlations between time dummies and mlegal variables).

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<sup>14</sup>Note that the choice of the reference variable affects the intercept of the equation. This problem is avoided while using relative legal framework variable. Yet, in this case, we are unable to distinguish separately the influence of the partners’ legal framework.

<sup>15</sup>Recall that this rating is assigned only to EU countries.

<sup>16</sup>This is done for comparison purpose, as xlegal5 is dropped when we estimate border effects on the CEFTA sample. Actually, any CEFTA country is rated 5. This dropping affects the intercept of the equation and consequently the measure of the border effect. In the same way, xlegal3 and xlegal4 are removed when we estimate border effects on the EU sample.



Table 2: Measure of border effects using the “extensiveness and effectiveness of legal reform” EBRD indicator with different samples

Sample :	Dep. Variable: Ln of relative trade					
	whole sample	whole sample	EU count.	EU count.	CEFTA count.	CEFTA count.
Model :	(1)	(2)	(3)	(4)	(5)	(6)
Border effect	-3.863 <sup>a</sup> (0.218)	-3.920 <sup>a</sup> (0.219)	-1.873 <sup>a</sup> (0.587)	-1.794 <sup>a</sup> (0.544)	-3.499 <sup>a</sup> (0.442)	-3.605 <sup>a</sup> (0.442)
Ln relative production	1.201 <sup>a</sup> (0.045)	1.214 <sup>a</sup> (0.045)	1.153 <sup>a</sup> (0.044)	1.151 <sup>a</sup> (0.044)	0.902 <sup>a</sup> (0.068)	0.906 <sup>a</sup> (0.067)
Ln relative price	-0.269 <sup>a</sup> (0.032)	-0.279 <sup>a</sup> (0.031)	-0.468 <sup>a</sup> (0.067)	-0.475 <sup>a</sup> (0.066)	-0.211 <sup>a</sup> (0.072)	-0.233 <sup>a</sup> (0.071)
Ln relative distance	-1.737 <sup>a</sup> (0.120)	-1.671 <sup>a</sup> (0.119)	-2.016 <sup>a</sup> (0.162)	-2.005 <sup>a</sup> (0.161)	-1.671 <sup>a</sup> (0.203)	-1.596 <sup>a</sup> (0.202)
Common border	0.843 <sup>a</sup> (0.101)	0.887 <sup>a</sup> (0.101)	0.893 <sup>a</sup> (0.183)	0.897 <sup>a</sup> (0.183)	0.540 <sup>a</sup> (0.145)	0.570 <sup>a</sup> (0.146)
Association or free trade agreement	0.623 <sup>a</sup> (0.103)	0.503 <sup>a</sup> (0.090)	0.044 (0.228)	-0.023 (0.150)	1.113 <sup>a</sup> (0.173)	1.136 <sup>a</sup> (0.156)
Fixed time effects year 1995	-	-	-	-	-	-
Fixed time effects year 1996	-0.482 <sup>a</sup> (0.118)		-0.208 (0.191)		-0.490 <sup>a</sup> (0.184)	
Fixed time effects year 1997	-0.219 <sup>c</sup> (0.117)		0.016 (0.192)		-0.115 (0.179)	
Fixed time effects year 1998	-0.124 (0.124)		-0.019 (0.182)		-0.093 (0.205)	
Importer legal framework rated 2	Ref. var.	Ref. var.	Ref. var.	Ref. var.	Ref. var.	Ref. var.
Importer legal framework rated 3	1.244 <sup>a</sup> (0.163)	0.931 <sup>a</sup> (0.130)	0.900 <sup>a</sup> (0.242)	0.800 <sup>a</sup> (0.157)	0.766 <sup>a</sup> (0.246)	0.489 <sup>a</sup> (0.195)
Importer legal framework rated 4	1.469 <sup>a</sup> (0.144)	1.281 <sup>a</sup> (0.126)	1.386 <sup>a</sup> (0.213)	1.326 <sup>a</sup> (0.157)	0.414 (0.285)	0.251 (0.268)
Mills Ratio	4.193 <sup>a</sup> (1.237)	4.105 <sup>a</sup> (1.239)	2.755 <sup>a</sup> (0.932)	2.620 <sup>a</sup> (0.930)	3.179 (1.997)	2.995 (1.980)
Observations	3354	3354	2350	2350	1004	1004
R <sup>2</sup>	0.445	0.457	0.475	0.474	0.414	0.405

Notes: Standard errors in parentheses with <sup>a</sup> and <sup>c</sup> respectively denoting significance at the 1% and 10% levels. Columns (3) and (4) include only trade flows with EU countries and columns (5) and (6) include only trade flows with CEFTA countries. In specifications (2), (4) and (6), we remove fixed effects in order to control for multicollinearity. See text for more details.

We do not denote a linear combination between time dummies and “mlegal”, coefficients are relatively stable across estimations.

The results highlight a stronger border effect for the trade of Hungary, Romania and Slovenia with CEFTA countries (columns 5 and 6) than with EU countries (columns 3 and 4). The principal explanation lies on the logic of the agreements. The association agreements between the CEECs and EU are exclusively bilateral agreements (Richter, 1998). This leads to the formation of a qualified “hub-and-spoke bilateralism” (Baldwin, 1994). Consequently, CEFTA countries favour the development of their exchanges with the EU and attach less importance to the liberalisation of their mutual trade. This phenomenon is accentuated by the “internal contradiction” of the CEFTA, which integrates at the same time elements of bilateralism and multilateralism.

If the border effect is weaker in the EU sample, the magnitude of the distance is larger. The distance variable is a proxy for transaction costs inherent to any commercial relation. Empirical literature documents that East-West trade flows are impeding by high transaction costs. The magnitude of the “common border” is weaker in the CEFTA sample (columns 5 and 6) comparing with the other specifications<sup>17</sup>.

Concerning trade with EU countries, the impact of the importer’s legal framework quality is positive and significant. So, the EU producers seem to take into account the legal framework quality of their partners in their export decisions. Comparatively, the attitude of CEFTA producers presents certain differences: the estimated coefficient on mlegal3 is positive and significant but the coefficient on mlegal4 is not. This is a challenging result on which we will return.

We also test the sensitivity of our results with respect to the measurement of another rating. An index evaluating the exchange system quality is substituted for our measure of legal framework quality. This index is constructed by the EBRD (see appendix 2 for a detailed description). Again, in our sample, not all ratings are assigned to CEECs: only 3, 4 and 4+ are used for both importer and exporter). The results are presented in table 3. As previously mentioned, The EBRD considers EU countries as reference countries and assigns to each one a rating of 5. This notation can induce a potential bias. In table 6 (see appendix 1), we tackle this problem by including EU exporter dummies to the current specification. In consequence, the variable “exporter commercial system” (henceforth xtrade) rated 5 is dropped and we get the influence of the EU countries. Note that just Portugal has a non significant coefficient.

We run a first estimation taking into account the commercial system quality and including time dummies (column 1). The results for the estimated coefficients of border effect, production, price, distance and common border are in line with those previously found. The variable association is not significant. One possible explanation lies in the linear combination of this variable with “mtrade” or “xtrade”. As shown in column (3), when we use the variable “relative commercial system”, the variable association is highly significant ( $p < 0,01$ ).

Introduction of time dummies is also a potential source of multicollinearity, which can bias the estimated coefficients of commercial system variables. Actually, some pair-wise correlations are significant at the 1% level and relatively high (see table 8 in appendix 1). In specification (2), we perform an estimation without time dummies. We note a variation of the significances and magnitudes of the importer and exporter commercial system variables,

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<sup>17</sup>Note that, in columns (3) and (4), the non significant coefficient of the dummy variable “association or free trade agreement” is due to a small number of observations different from one in the EU sample.

Table 3: Measure of border effects using the “trade and foreign exchange system” EBRD indicator

Whole sample in all specifications	Dep. Variable: Ln of relative trade				
Model :	(1)	(2)	(3)	(4)	(5)
Border effect	-2.985 <sup>a</sup> (0.444)	-3.826 <sup>a</sup> (0.395)	-3.237 <sup>a</sup> (0.222)	-3.820 <sup>a</sup> (0.396)	-4.823 <sup>a</sup> (0.415)
Ln relative production	1.033 <sup>a</sup> (0.040)	1.040 <sup>a</sup> (0.040)	1.149 <sup>a</sup> (0.047)	1.045 <sup>a</sup> (0.035)	1.024 <sup>a</sup> (0.037)
Ln relative price	-0.225 <sup>a</sup> (0.054)	-0.296 <sup>a</sup> (0.051)	-0.127 <sup>a</sup> (0.038)	-0.304 <sup>a</sup> (0.052)	-0.215 <sup>a</sup> (0.053)
Ln relative distance	-1.914 <sup>a</sup> (0.124)	-1.966 <sup>a</sup> (0.124)	-1.470 <sup>a</sup> (0.110)	-1.958 <sup>a</sup> (0.118)	-1.904 <sup>a</sup> (0.129)
Common border	0.532 <sup>a</sup> (0.111)	0.527 <sup>a</sup> (0.112)	0.928 <sup>a</sup> (0.100)	0.522 <sup>a</sup> (0.114)	0.526 <sup>a</sup> (0.113)
Association or free trade agreement	-0.016 (0.123)	-0.027 (0.122)	0.667 <sup>a</sup> (0.091)	-0.055 (0.121)	0.024 (0.118)
Fixed time effects year 1995	-	-	-	-	-
Fixed time effects year 1996	-0.730 <sup>a</sup> (0.165)				
Fixed time effects year 1997	-0.500 <sup>a</sup> (0.125)				
Fixed time effects year 1998	-0.336 <sup>b</sup> (0.142)				
Ln relative infrastructure				-0.121 (0.168)	
Ln relative commercial system			-2.291 <sup>a</sup> (0.325)		
Importer legal framework rated 2					Ref. var.
Importer legal framework rated 3					0.928 <sup>a</sup> (0.140)
Importer legal framework rated 4					0.935 <sup>a</sup> (0.127)
Importer commercial system rated 3	Ref. var.	Ref. var.		Ref. var.	Ref. var.
Importer commercial system rated 4	0.132 (0.168)	0.654 <sup>a</sup> (0.115)		0.674 <sup>a</sup> (0.116)	0.862 <sup>a</sup> (0.132)
Importer commercial system rated 4+	1.311 <sup>a</sup> (0.159)	1.424 <sup>a</sup> (0.145)		1.489 <sup>a</sup> (0.160)	1.499 <sup>a</sup> (0.168)
Exporter commercial system rated 3	Ref. var.	Ref. var.		Ref. var.	Ref. var.
Exporter commercial system rated 4	0.470 (0.337)	0.787 <sup>b</sup> (0.327)		0.777 <sup>b</sup> (0.327)	0.793 <sup>b</sup> (0.326)
Exporter commercial system rated 4+	0.803 <sup>b</sup> (0.337)	1.041 <sup>a</sup> (0.330)		1.008 <sup>a</sup> (0.333)	0.875 <sup>a</sup> (0.331)
Exporter commercial system rated 5	1.555 <sup>a</sup> (0.382)	1.994 <sup>a</sup> (0.371)		1.964 <sup>a</sup> (0.376)	1.698 <sup>a</sup> (0.371)
Mills Ratio	0.256 (1.009)	0.415 (1.014)	2.388 <sup>c</sup> (1.244)	0.734 (0.822)	0.047 (0.953)
Observations	3354	3354	3354	3354	3354
R <sup>2</sup>	0.471	0.467	0.449	0.467	0.474

Notes: Standard errors in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively denoting significance at the 1%, 5% and 10% levels. In specifications (2) to (7), we remove fixed time effects in order to control for multicollinearity. See text for more details.

which change more over each year than across panels. In consequence, in following specifications, including commercial system variables, we remove fixed time effects to control for multicollinearity. The results are obvious: higher is the quality of the partner’s commercial system, larger is trade.

In column (3), we include a measure of the relative commercial system quality. The estimated coefficient on this variable is negative and higher than one obtained with the “extensiveness and effectiveness of legal reform” EBRD indicator. In columns (4) and (5), we introduce control variables to check if the commercial system variable is dealing specifically with this problem. The coefficient of the relative infrastructure development is not significant and does not alter the impact of “mtrade” and “xtrade”. The same conclusion can be drawn after the introduction of “mlegal”. It is worth noting that each set of dummies captures a different problem: “Extensiveness and effectiveness of the legal reform” on the one hand, and “Trade and foreign exchange system” on the other hand.

In table 4, we proceed to separated estimations according to different samples. The whole sample is considered in column (1). Then, we restrict our estimations to EU countries (column 2) and to CEFTA countries (column 3). The results present several similarities with those obtained previously: trade with the EU is promoted if the commercial system quality of the importer is high. In the opposite, the estimated coefficients for the CEFTA countries are less or not significant.

Two main conclusions could be derived from this empirical analysis. First, institutional quality is an important determinant of trade with the EU. Second, the CEFTA producers seem not or less affected by this quality in their trade decisions. A possible explanation could be the following: comparatively to the EU producers, the CEFTA producers have a better knowledge of the CEECs’ legal framework quality. This better knowledge includes a higher capacity for answering to the gaps of the institutional framework. This knowledge comes partly from their own experiences. Actually, they face same problems in their countries. A complementary explanation can be found in the persistence of production networks, which sustain existing interactions. In other words, where legal institutions are weak, bilateral relationships can substitute for the courts in supporting trade.

Our database consists of 23 ISIC<sup>18</sup> revision 2 sectors. Because of an insufficient level of disaggregation for some country data, several sectors are pooled. Our estimations are eventually conducted on 17 sectors or groups of sectors. This sectoral breakdown allows us to estimate border effects for each industry and separately for EU and CEFTA countries, using specification of Table 2 with time dummies. We also perform Heckman’s two-step procedure. To find the border effect of each industry, we sum the specific border effect of the industry and the average border effect for all industries (intercept of the regression). The results are presented in Table 5. The industries are ordered, in column (1), in terms of increasing magnitudes.

Our main findings are the following:

- The results exhibit high border effects in Tobacco, Printing, publishing and allied industries, Beverage industries, Petroleum refineries, Wood and Food manufacturing. Some products are hard to transport or to diffuse abroad, they are less tradable (like Printing) and others convey strict domestic preferences (like Tobacco, Beverage and Food).

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<sup>18</sup>ISIC means International Standard Industrial Classification.

Table 4: Measure of border effects using the “trade and foreign exchange system” EBRD indicator with different samples

Sample :	Dep. Variable: Ln of relative trade		
	whole sample	EU count.	CEFTA count.
Model :	(1)	(2)	(3)
Border effect	-3.748 <sup>a</sup> (0.221)	-1.170 <sup>a</sup> (0.539)	-3.945 <sup>a</sup> (0.408)
Ln relative production	1.113 <sup>a</sup> (0.041)	1.037 <sup>a</sup> (0.040)	0.882 <sup>a</sup> (0.044)
Ln relative price	-0.073 <sup>b</sup> (0.033)	-0.171 <sup>b</sup> (0.073)	-0.183 <sup>a</sup> (0.073)
Ln relative distance	-1.636 <sup>a</sup> (0.105)	-2.086 <sup>a</sup> (0.148)	-1.436 <sup>a</sup> (0.174)
Common border	0.753 <sup>a</sup> (0.102)	0.460 <sup>a</sup> (0.181)	0.551 <sup>a</sup> (0.148)
Association or free trade agreement	1.119 <sup>a</sup> (0.120)	-0.800 <sup>a</sup> (0.200)	1.159 <sup>a</sup> (0.201)
Importer commercial system rated 3	Ref. var.	Ref. var.	Ref. var.
Importer commercial system rated 4	0.708 <sup>a</sup> (0.114)	0.583 <sup>a</sup> (0.143)	0.350 <sup>c</sup> (0.192)
Importer commercial system rated 4+	1.584 <sup>a</sup> (0.146)	1.716 <sup>a</sup> (0.176)	0.349 (0.261)
Mills Ratio	1.906 <sup>c</sup> (1.070)	1.000 (0.795)	4.860 <sup>b</sup> (2.119)
Observations	3354	2350	1004
R <sup>2</sup>	0.467	0.482	0.405

Notes: Standard errors in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively denoting significance at the 1%, 5% and 10% levels. Column (2) includes only trade flows with EU countries and column (3) includes only trade flows with CEFTA countries. We remove fixed effects in order to control for multicollinearity. See text for more details.

Table 5: Border effects by industries

Sample :	EU countries	CEFTA countries
Model :	(1)	(2)
Textiles	-9.74 <sup>a</sup>	4.03 <sup>a</sup>
Electrical Machinery	-3.89 <sup>a</sup>	8.28 <sup>a</sup>
Machinery (except electrical)	-2.76 <sup>b</sup>	11.48 <sup>a</sup>
Measuring and Controlling equipment	-2.16 <sup>c</sup>	31.56 <sup>a</sup>
Rubber and plastic products	-1.56	7.96 <sup>a</sup>
Metal products	-1.17	11.11 <sup>a</sup>
Chemical products	1.12	9.20 <sup>a</sup>
Transport equipment	1.31	41.22 <sup>a</sup>
Iron and steel	1.64	13.72 <sup>a</sup>
Paper	2.16 <sup>c</sup>	10.50 <sup>a</sup>
Other non-metallic mineral products	2.17 <sup>c</sup>	15.96 <sup>a</sup>
Wood	5.58 <sup>a</sup>	86.75 <sup>a</sup>
Beverage	5.66 <sup>a</sup>	378.42 <sup>a</sup>
Food	6.02 <sup>a</sup>	72.60 <sup>a</sup>
Petroleum	14.14 <sup>a</sup>	24.75 <sup>a</sup>
Printing, publishing	17.29 <sup>a</sup>	221.63 <sup>a</sup>
Tobacco	48.86 <sup>a</sup>	147.23 <sup>a</sup>

Notes: Standard errors in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively denoting significance at the 1%, 5% and 10% levels. Border effects of each industries are performed using specification of table 2 with time dummies. The industries are ordered, in column 1, in terms of increasing magnitudes. Column (1) includes only trade flows with EU countries and column (2) includes only trade flows with CEFTA countries.

- The results display weaker border effects in Textile and Machinery (electrical and non electrical). In these industries, we note even a strict preference of the “average” consumer for the West European products (column 2). With a lower significance ( $p < 0, 1$ ), this is also the case for Measuring and controlling equipment and Photographic and optical goods.
- They are also industries with a border effect around the average border effect, like Transport equipment or Iron and Steel. These sectors are identified as moderate tariff and non-tariff barriers’ industries in the East and West trade relationships. Besides, in the specific case of the Transport equipment, the establishment of multinational firms in CEECs and the development of a local production could explain the existence of a home bias<sup>19</sup>.

Our sectoral hierarchy offers certain similarities with other studies working on different areas (Head and Mayer (2000, 2001), Disdier and Mucchielli (2002)). In these studies, the border effects in food and beverages industries are among the highest, as well as in the printing industry. Textile, Machinery and Optical goods are subjected to weaker border effects than the other sectors. Furthermore, as Head and Mayer’s studies, we observe for some industries a stronger preference for foreign goods.

## 5 Conclusion

We attempted in this paper to emphasize that extra legal costs stemming from a weak legal framework act as informal trade barriers. Thus, we introduce in our study different measures of the legal framework quality. We note a variation of this quality across our sample. Actually, CEFTA countries have a less effective and extensive legal framework than EU countries.

We find that legal framework quality appears as a strong determinant of export decisions of the EU producers. This result is justified insofar as the exporters undertake the most significant sunk costs. The deliveries of goods comes before their effective payments as argued by Turrini and van Ypersele (2002: 4). In the opposite, the CEFTA producers seem less affected by this quality in their trade decisions.

Over the period 1995-1998, our border effects estimates of the intra-CEFTA trade and CEFTA-EU trade underline certain divergences. We show that the border effects of Slovenia, Hungary, and Romania is more significant *vis-à-vis* the CEFTA. The integration process to EU seems to compete with the integration within the CEFTA.

The following stage of our work will consist in estimating the border effects over a broader period, of 1991 to 1998. Then, we will be able to highlight the direct impact of the signing of the CEECs’ association agreements with EU and the CEFTA creation in 1993. Another interesting idea would be to use tariff and non-tariff barrier data in order to evaluate the border effects more precisely.

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<sup>19</sup>The local production of multinational firms induces a home bias, because goods are statistically defined as domestic goods even if consumers identified them as foreign goods.

## References

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## **Appendix 1: Additional tables**

Table 6: Measure of border effects using the EBRD indicators with EU exporter dummies

Sample :	Dep. Variable: Ln of relative trade			
	whole s.		whole s.	
Model :	(1)		(2)	
Border effect	-4.961 <sup>a</sup>	(0.409)	-4.651 <sup>a</sup>	(0.461)
Ln relative production	0.997 <sup>a</sup>	(0.061)	0.847 <sup>a</sup>	(0.055)
Ln relative price	-0.290 <sup>a</sup>	(0.061)	-0.267 <sup>a</sup>	(0.063)
Ln relative distance	-1.245 <sup>a</sup>	(0.205)	-1.554 <sup>a</sup>	(0.170)
Common border	0.915 <sup>a</sup>	(0.131)	0.623 <sup>a</sup>	(0.128)
Association or free trade agreement	0.525 <sup>a</sup>	(0.091)	0.179	(0.125)
Importer legal framework rated 2	Ref. var.			
Importer legal framework rated 3	0.779 <sup>a</sup>	(0.133)		
Importer legal framework rated 4	1.220 <sup>a</sup>	(0.127)		
Exporter legal framework rated 2	Ref. var.			
Exporter legal framework rated 3	0.123	(0.219)		
Exporter legal framework rated 4	0.205	(0.209)		
Exporter legal framework rated 5	-			
Importer commercial system rated 3			Ref. var.	
Importer commercial system rated 4			0.683 <sup>a</sup>	(0.115)
Importer commercial system rated 4+			1.286 <sup>a</sup>	(0.148)
Exporter commercial system rated 3			Ref. var.	
Exporter commercial system rated 4			0.679 <sup>b</sup>	(0.339)
Exporter commercial system rated 4+			1.087 <sup>a</sup>	(0.342)
Exporter commercial system rated 5			-	
Austria	1.342 <sup>a</sup>	(0.283)	2.294 <sup>a</sup>	(0.387)
Denmark	-0.051	(0.382)	1.393 <sup>a</sup>	(0.452)
Finland	-0.315	(0.410)	1.424 <sup>a</sup>	(0.473)
France	0.857 <sup>b</sup>	(0.366)	2.301 <sup>a</sup>	(0.438)
Germany	1.253 <sup>a</sup>	(0.351)	2.611 <sup>a</sup>	(0.430)
Greece	-0.027	(0.336)	1.163 <sup>a</sup>	(0.426)
Ireland	-0.189	(0.366)	1.619 <sup>a</sup>	(0.438)
Italy	0.994 <sup>a</sup>	(0.372)	2.394 <sup>a</sup>	(0.448)
Netherlands	0.825 <sup>b</sup>	(0.364)	2.107 <sup>a</sup>	(0.441)
Portugal	-1.733 <sup>a</sup>	(0.396)	0.148	(0.464)
Spain	-0.161	(0.399)	1.487 <sup>a</sup>	(0.461)
Sweden	0.574	(0.410)	2.274 <sup>a</sup>	(0.472)
United Kingdom	0.738 <sup>b</sup>	(0.350)	2.231 <sup>a</sup>	(0.425)
Mills Ratio	5.264 <sup>a</sup>	(1.470)	0.950	(1.200)
Observations	3354		3354	
R <sup>2</sup>	0.494		0.493	

Notes: Standard errors in parentheses with <sup>a</sup> and <sup>b</sup> respectively denoting significance at the 1% and 5% levels. In specification (2), we remove fixed time effects in order to control for multicollinearity. For the sake of comparison, we also remove fixed time effects in specification (1). Variables “Exporter legal framework rated 5” and “Exporter commercial system rated 5” are dropped to avoid multicollinearity with EU exporter dummies. See text for more details.

Table 7: Pair-wise correlation between time dummies and importer and exporter legal framework variables

		Importer legal framework rated			Exporter legal framework rated			
		2	3	4	2	3	4	5
Fixed time effects	1995	0.522 <sup>a</sup>	-0.193 <sup>a</sup>	-0.098 <sup>a</sup>	0.052 <sup>a</sup>	0.039 <sup>b</sup>	-0.053 <sup>a</sup>	
	1996	-0.174 <sup>a</sup>	0.193 <sup>a</sup>	-0.098 <sup>a</sup>	-0.087 <sup>a</sup>			
	1997	-0.174 <sup>a</sup>	0.193 <sup>a</sup>	-0.098 <sup>a</sup>	-0.087 <sup>a</sup>	0.102 <sup>a</sup>	-0.053 <sup>a</sup>	
	1998	-0.174 <sup>a</sup>	-0.193 <sup>a</sup>	0.293 <sup>a</sup>	0.121 <sup>a</sup>	-0.149 <sup>a</sup>	0.080 <sup>a</sup>	

Note: <sup>a</sup> and <sup>b</sup> denote respectively significance at the 1% and 5% levels. Coefficients with larger significance levels are left blank.

Table 8: Pair-wise correlation between time dummies and importer and exporter commercial system variables

		Importer commercial system rated			Exporter commercial system rated			
		3	4	4+	3	4	4+	5
Fixed time effects	1995	-0.174 <sup>a</sup>	0.683 <sup>a</sup>	-0.577 <sup>a</sup>	-0.054 <sup>a</sup>	0.240 <sup>a</sup>	-0.238 <sup>a</sup>	
	1996	0.522 <sup>a</sup>	-0.488 <sup>a</sup>	0.193 <sup>a</sup>	0.163 <sup>a</sup>	-0.172 <sup>a</sup>	0.137 <sup>a</sup>	
	1997	-0.174 <sup>a</sup>	-0.098 <sup>a</sup>	0.193 <sup>a</sup>	-0.054 <sup>a</sup>	-0.034 <sup>a</sup>	0.051 <sup>a</sup>	
	1998	-0.174 <sup>a</sup>	-0.098 <sup>a</sup>	0.193 <sup>a</sup>	-0.054 <sup>a</sup>	-0.034 <sup>a</sup>	0.050 <sup>a</sup>	

Note: <sup>a</sup> denotes significance at the 1% level. Coefficients with larger significance levels than 5% are left blank.

## Appendix 2: Data description

Our database consists of 23 ISIC revision 2 sectors. Because of an insufficient level of disaggregation for some data, several sectors are pooled in the estimations. Our estimations are eventually conducted on 17 sectors or groups of sectors: Food manufacturing - Beverage industries - Tobacco manufactures - Manufacture of textiles - Manufacture of wood and wood and cork products, except furniture - Manufacture of paper and paper products - Printing, publishing and allied industries - Manufacture of industrial chemicals, manufacture of other chemical products - Petroleum refineries, manufacture of miscellaneous products of petroleum and coal - Manufacture of rubber products, manufacture of plastic products n.e.c. - Manufacture of other non-metallic mineral products - Iron and steel basic industries, non-ferrous metal basic industries - Manufacture of fabricated metal products, except machinery and equipment - Manufacture of machinery except electrical - Manufacture of electrical machinery, apparatus, appliances and supplies - Manufacture of transport equipment - Manufacture of professional and scientific, and measuring and controlling equipment n.e.c., and of photographic and optical good.

### Trade

Sectoral imports flows data  $m_{ij}$  of Hungary, Romania, and Slovenia are obtained from the CHELEM database, constructed by the CEPIL. For the determination of the intra-national trade of a country, we refer to the Wei's (1996) method. This method leads us to use production and export data in a compatible classification. The export data are extracted from the CHELEM database and the production data are taken from the Industrial Statistical Yearbooks of the UNIDO and OECD (cf. *infra*).

### Production

The production data  $\nu_k$  are obtained from the Industrial Statistical Yearbooks of the UNIDO ("International Yearbook of Industrial Statistics") and OECD ("Statistiques des Structures Industrielles").

### Prices

Average wages and salaries of employees are chosen as measure of the labor cost  $p_k$ . Dividing wages and salaries paid to employees by the number of persons employed, we get the average wage and salary per capita. Data are taken from the Industrial Statistical Yearbooks of the UNIDO and OECD.

National statistics are used in order to complete the missing series for the above-described variables.

## Distance

Internal  $d_{ii}$  and external  $d_{ij}$  distances are extracted from a distance software provided by GT Interactive Company. We calculate the fastest distances by road between the capitals of the regions. The regional disaggregation of EU countries follows the NUTS Classification. We opt for the NUTS 1 level for all EU countries, except for Austria, Italy, Greece, and Portugal. For these four countries, we chose the NUTS 2 level. For CEECs, we refer to the statistical regions proposed by Eurostat on the pattern of NUTS Classification. Except for Poland, we chose the NUTS 3 level. In case of Poland, the unavailability of a NUTS 3 disaggregation leads us to opt for the NUTS 2 level. The regional repartition of the population is extracted from the REGIO database published by Eurostat.

## Agreements

We consider two kinds of agreements: the “association agreements” of CEECs with EU and the “free trade agreements” between CEECs for the establishment or the membership to the CEFTA. In both cases, we choose the date of the signing of the agreement and not the date of its coming into force. This choice is justified by the fact that the signing of an agreement bears witness of will of two countries to develop their mutual trade. If an agreement is signed over the period 1995-1998, we apply the following rule: from this year onwards, the dummy variable takes a value of 1, and concerning the year of the signing, it is equal to 1 if the signing happens before the middle of the year, and 0 otherwise.

## Legal framework

The indicator “extensiveness and effectiveness of legal reform”, constructed by the EBRD, offers an evaluation of the legal framework quality in the CEECS and of its evolution since 1995. Using different standards, the EBRD assigns a rating on a scale going from 1 to 4+. The EBRD considers EU countries as reference countries and assigns to each one a rating of 5.

Table 9: Legal transition indicators, 1995-1998

<b>Year</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>
Bulgaria	3	4	3	4
Czech Republic	4	4	4	4
Hungary	4	4	4	4
Poland	4	4	4	4
Romania	2	3	3	4
Slovak Republic	3	3	3	2
Slovenia	3	3	3	3

Source: Various EBRD reports.

Table 10: Extensiveness and effectiveness of legal reform

<b>Definition</b>	<b>Rating</b>
Commercial legal rules are usually very unclear and sometimes contradictory. The administration and judicial support for the law is rudimentary. The cost of transactions, such as creating a pledge over a movable asset, is prohibitive so as to render a potentially extensive law ineffective. There are no meaningful procedures in place in order to make commercial laws fully operational and enforceable. There are significant disincentives for creditors to seek the commencement of bankruptcy proceedings in respect of insolvent debtors.	1
Commercial legal rules are generally unclear and sometimes contradictory. There are few, if any, meaningful procedures in place in order to make commercial laws operational and enforceable.	2
While commercial legal rules are reasonably clear, administration or judicial support of the law is often inadequate or inconsistent so as to create a degree of uncertainty (e.g. substantial discretion in the administration of laws, few up-to-date registries for pledges).	3
Commercial laws are reasonably clear and administrative, and judicial support of the law is reasonably adequate. Specialised courts, administrative bodies or independent agencies may exist for the liquidation of insolvent companies, the registration of publicly traded shares or the registration of pledges.	4
Commercial laws are clear and readily ascertainable. Commercial law is well supported administratively and judicially, particularly regarding the efficient functioning of courts, liquidation proceedings, the registration of shares and the orderly and timely registration of security interests.	4+

Source: EBRD (2000).

## Commercial system

Constructed since 1994 by the EBRD, the indicator “Trade and foreign exchange rate system” measures different levels of development of the commercial system in CEECs. Ratings are going on a scale from 1 to 4+, and EU countries serve as reference countries and receive a rating of 5.

Table 11: Commercial transition indicators, 1995-1998

Year	1995	1996	1997	1998
Bulgaria	4	4	4	4
Czech Republic	4	4+	4+	4+
Hungary	4	4+	4+	4+
Poland	4	4+	4+	4+
Romania	4	3	4	4
Slovak Republic	4	4+	4	4
Slovenia	4	4+	4+	4+

Source: Various EBRD reports.

Table 12: Trade and foreign exchange system

Definition	Rating
Widespread import and/or export controls or very limited legitimate access to foreign exchange.	1
Some liberalisation of import and/or export controls; almost full current account convertibility in principle but with a foreign exchange regime that is not fully transparent (possibly with multiple exchange rates).	2
Removal of almost all quantitative and administrative import and export restrictions; almost full current account convertibility.	3
Removal of all quantitative and administrative import and export restrictions (apart from agriculture) and all significant export tariffs; insignificant direct involvement in exports and imports by ministries and state-owned trading companies; no major non-uniformity of customs duties for non-agricultural goods and services; full current account convertibility.	4
Standards and performance norms of advanced industrial economies of most tariff barriers; WTO membership.	4+

Source: EBRD (2000).



## Infrastructures

The infrastructure index is calculated by applying Limao and Venables's (2001) method. Four variables are used: kilometers of road per square kilometer of country area, kilometers of paved road per square kilometer of country area, kilometers of rail per square kilometer of country area, and telephone main lines per person. Data are extracted from the Database of World Infrastructure Stocks published by Canning (1998):

(<http://www.worldbank.org/html/dec/Publications/Workpapers/WPS1900series/wps1929/canning1.xls>). In order to extract the structural effect of infrastructures quality from the cyclical ones, this index is constructed only for the year 1995, which corresponds to the first year of our database.