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ABSTRACT

Accession to the WTO and EU Enlargement: What Potential for Trade Increase?*

This Paper asks the question of the impact of institutions on trade and tries to estimate the potential for trade increase between CIS, Central Eastern European countries and the EU. The latter is computed using the gravity equation and the procedure introduced by Hausman and Taylor (1981). It is shown that CIS trade is still characterized by a very large trade destruction effect, which implies that trade with EU countries could increase in the long-run in proportion to this trade destruction effect. Furthermore, institutions matter, and the convergence of institutional variables towards the EU standards - under the current process of EU enlargement and the application of Russia to join the WTO - can be expected to deepen the level of the European trade integration.

JEL Classification: C10, F10 and P20

Keywords: accession to the WTO, EU enlargement, gravity equation, institutions and transition

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Introduction

The transition from the Plan to the Market in CIS² and CEECs (Central Eastern European Countries) entails big changes over a short time span, in institutions on the one hand, and in trade integration and blocs geography on the other. According to the received literature, increase in trade openness and institutional improvement can both be expected to influence rapidly the growth rate. Our objective in this paper is to estimate the potential benefit from Russia's participation in the WTO and from the EU enlargement towards CEECs, by computing the impact of institutions on the intensity of bilateral trade flows. The rationale underlying this empirical strategy is that, to a large extent, joining the WTO and entering the EU overlap with the achievement of the transition towards a market economy³.

The break-up of the Former Soviet Union (FSU), a highly integrated economy of 15 regions, into 15 independent states, has reduced mutual trade flows between these former components. Nevertheless, everyone agrees that 10 years after this break-up took place, intra-FSU trade still remains at a very high level. Our purpose is to explore the reasons why this is so. On the one hand, the experience of the Austro-Hungarian empire, which broke-up in 1919, shows that regionalism leaves its mark during a long time over newly created independent states (De Menil, Maurel, 1994 and Maurel 1998). On the other hand, the heritage of 70 years of strong state intervention still stamped in post-communist institutions may as well explain a part of the "excess" intra-FSU or intra-CIS trade (Duchene 1994), and it may as well explain the non-fulfilment of the trade potential with other market economies. Apart from the inheritance of the former CMEA (Council of Mutual Economic Assistance), one can also assume that trade has the capacity to increase in the medium run, roughly understood as a period when some CIS countries will be members of the EU. This definition of medium run includes many things: convergence of transition countries in terms of GDP per head, narrowing of their patterns of specialisation with respect to that of the EU countries, and developing the basis for a much more intensive intra-industry trade.

Both the institutional aspects and the medium run perspectives for increases in trade can be computed on the basis of the gravity equation. The latter has been extensively used in the literature on regionalism versus globalisation, for instance to deal with the impact of EU, ASEAN, or NAFTA on trade integration and trade blocs⁴. Similarly, we will use the gravity framework to answer the question of the impact of being member of the CIS (CEECs respectively) on bilateral trade flows, and the potential for trade increase if CIS (CEECs respectively) were to be member of the EU. Furthermore,

² Even if the CIS is no more a political entity in the negotiations for entering the WTO, we consider it as a group of countries sharing common histories, cultures, and protectionist behaviours.

³ See Piazzolo (2000).

⁴ For a comprehensive review of the empirical literature about trade blocs, see Jeffrey Frankel, Ernesto Stein and Shang-Jin Wei, (1997).

we will augment the gravity equation with institutional variables, like the extent to which property rights are protected in partner countries, the share of the black market in the whole economy, or more directly the importance of tariff and non-tariff barriers to trade, and corruption in the custom service. Those variables are used for computing the extra trade implied by converging towards the EU and WTO institutional standards. The paper gets its inspiration (and originality) from both empirical growth studies and studies based upon the gravity equation. Another original feature rests in the econometric procedure allowing to estimate time-invariant variables coefficients even in the fixed effects framework. In the first section we describe the background and related literature. In the second, we present the specification of the gravity equation; the latter is augmented by the institutional variables⁵, whose expected impact on trade integration is documented. In the third part we present the results and simulation exercises. We conclude by drawing the main policy implications.

Background and Related Literature

In trying to disentangle the respective role of good institutions and trade openness for explaining growth, there are actually two strands: one strand put the stress on the impact of trade openness on convergence and growth⁶; the other sheds light on the importance of good institutions in driving the pattern of growth. The principal difficulty arises when one recognises that causality runs in all possible directions: from both trade and institutions to growth – institutions that protect property rights for instance are shown to matter for growth in the long run, while trade induces increases in productivity – ; from growth and trade to institutions – accelerated growth and higher trade openness favouring the demand for a better institutional framework –; and last but not least, from both growth and institutions to openness – this last causality is the one this paper focuses on, by matching the gravity framework with the literature on growth and institutions – .

For taking into account the resulting problem of endogeneity, David Dollar and Aart Kraay (2002) instrument their explanatory variables by the share of population that speaks a major European language⁷, or by settler mortality, as suggested by Acemoglu, Johnson, and Robinson (2001). The first set of regressions are in levels, and they are based upon cross section analysis. Because the instruments for trade openness and institutions are the same and/or highly correlated, one fails in disentangling the respective impacts of trade and institutions⁸. The second set of regression exploits

⁵ Institutional variables include variables allowing to evaluate the degree of economic freedom, assuming that more freedom guaranties more economic activities. The degree of government intervention (trade policy, the number of state banks, price controls), the extent to which corruption within bureaucracy or within the State can impede trade activity, the protection of property rights, in the absence of which contract execution is likely to be jeopardized, are examples of such institutions. For the exact set of variables used in this paper, see the econometric section.

⁶ See Frankel and Romer (1999), who documented the impact of trade on growth in the very long run.

⁷ See Hall and Jones (1999).

⁸ By running simple OLS however one avoids the latter multicollinearity problem, but fails in addressing the likely bias due to simultaneity.

the far from inertial dynamics of trade, institutions and growth over three decades, from the 70ies until now. The basic idea is that those three variables provide with natural and direct instruments, uncorrelated with each other: lagged increase in trade for increase in trade and lagged changes in institutions for institutional changes. A substantial effect can be attributed to changes in trade shares for predicting changes in growth rates, while the effect of institutions on growth is no longer significant, at least for what regards the equation in first-differences. While the same qualitative finding can be found in Alcalá and Ciccone (2001)⁹, the opposite is emphasised in Rodrik, Subramanian and Trebbi (2002), who show that the quality of institutions “trumps” everything else. In particular, when institutions are controlled for, trade is always insignificant. Those quite contrasted views emphasise that in the absence of an analytical model with clearly identified causal relationships there is no unambiguous empirical finding. A good instrument will never be good enough to make a theory. As underlined in Rodrik, Subramanian and Trebbi (2002), a good instrument is simply a way of identifying “an exogeneous source of variation in the independent variable of interest”, and as such it is unable to lay out a full theory of causes and effects.

While the major part of the literature is devoted to show that good institutions guarantee property rights and minimise transaction costs, thereby creating an environment conducive to growth and investment, in this paper we start from the observation that there is a scarcity of empirical studies measuring how institutions are important for trade. Like Rodrik (2000) has pointed out however, increases in trade are associated significantly with improvement in institutional quality, the latter making countries more attractive for their trading partners. On a more analytical level, the direct impact of institutions on trade has been analysed in James E. Anderson and Leslie Young (2000), who use a model of trade under two regimes, the rule of law (where institutions are present) and anarchy (institutions are absent). The former is favourable to trade enforcement while the latter undermines the incentives to make an exchange. In James E. Anderson and Leslie Young (2002), the non-linear empirical relationships between the degree of contract enforcement and that of trade integration is rationalized in a model of imperfect contract enforcement¹⁰. Finally Harry G. Broadman and Francesca Renati (2001) posit a reverse causality, namely that economic development and maturation of democratic processes, but also the degree of trade openness, may explain the increase in corruption. While the latter is recognized as being able to seriously jeopardize the reforms, a well-established system of market institutions favours economic growth, supports the reforms towards the market economy, and reduces the incentives for corruption. This paper focuses on the causality running from

⁹ Who emphasise that if the increase in productivity occurs in the tradable sector, any measure of openness based upon official GDP underestimates the real openness. They recommend the use of PPP GDP.

¹⁰ Our empirical analysis uses proxies for institutions such as the rule of law and the degree of contract enforcement. We show that both matter for trade integration.

institutions to trade intensity¹¹, and disregard the impact on growth, which is quite extensively debated in the literature, as well as the very long run¹².

Russia's WTO accession and EU enlargement have a strong and essential institutional dimension. For Paul Hare (2002), WTO accession is understood as helpful to Russia in the sense of locking in reforms and promoting further market oriented reforms. The same spirit lies in the White Book (2002), which emphasises that the EU *acquis communautaire* should be viewed as a lever for modernisation¹³. "It can offer Russia many solutions for construction of modern market institutions, but it is important to distinguish between parts of the *acquis*, which are logically related to the need for growth in a market environment, and parts of the *acquis*, which have more to do with EU enlargement process" (page 9). While the relationships between Russia and the EU are quite complex and far from straightforward, Russia's WTO accession is likely to provide a good working framework for further improvement and clarification in EU-Russia relations. Both processes, WTO accession and the emergence of a common sound economic space in Europe - whose first step was in 1997 the signature of a Partnerships and Cooperation Agreement - can help locking in reforms through provision of an external anchor¹⁴. The requirements are very similar: providing with the free movement of goods¹⁵, services and capital¹⁶, implementing market transparency and efficiency¹⁷. What could differ is the degree of their impact on the business climate and growth. According to Ksenia Yudaeva (2002), not only is the number of regulations from which WTO could require more transparency small, as compared with those required under the EU enlargement, but formal liberalisation already occurred as a part of the IMF stabilisation over the last decade. Formal liberalisation does not mean enforcement of market rules and procedures. The latter are precisely what is very likely to be crucial in the process of negotiating Russia's adhesion to the WTO.

¹¹ And therefore consider that corruption ranges amongst the set of explanatory variables.

¹² Our empirical analysis covers the period from 1994 to 2001. We do not consider directly the reverse causality, running from trade to institutions, but we take into account the likely endogeneity biases by using a fixed effects approach, which will be described in more details below.

¹³ The difference is the distinction within the *acquis* between what is relevant for growth, and what is relevant for EU enlargement. Russia would be more concerned with the former, while candidate countries ready to enter the EU in 2004 are concerned with the whole *acquis*: "But EU enlargement to Russia is not on the agenda. Therefore it is more appropriate to subordinate legal approximation to its impact on economic convergence: the CEES should be understood as a tool for economic approximation between the EU and Russia rather than as an institutional target in itself." (White Book, 2002, page 84).

¹⁴ Paul Hare (2002) argues that the restructuring of state-owned firms in China is helped by WTO membership, which is perceived as an external anchor.

¹⁵ Joining WTO means adopting a uniform tariff schedule with few basic rates, accepting the principle of the MFN clause, abandoning most non-tariff barriers to trade, which are reputed less transparent.

¹⁶ The *acquis* contains one more freedom, the free movement of persons; while WTO requires the freedom of establishment and national treatment for foreign firms in sectors such as business services, insurance, bank and services, for firms wishing to locate and invest, with few restrictions on sector, ownership shares, location.

¹⁷ In the *acquis* efficiency and transparency are company law (Chapter 5: public disclosure of the identity of those empowered to represent a company, and public disclosure of its financial situation; protection of intellectual and industrial property rights) and competition policy (Chapter 6: antitrust legislation, state aid, mergers, liberalisation of market entry). The issues of taxation (Chapter 10), agriculture (Chapter 7), environment (Chapter 22) and consumer protection (Chapter 23) are more specific to Europe.

According to Daniel Piazolo (2002), WTO accession is not likely to impose conditions that would impair EU interests, because sensitive sectors (agriculture, steel, textile) are not particularly regulated at the world level. Some sectors like the gas sector may raise concerns, inasmuch as it has maintained high subsidies in the form of price controls. Agriculture, which is largely state-owned benefits from export subsidies, which should have to be dismantled. To summarise, joining the WTO is likely to have an impact on trade intensity through the decline in protectionist policies¹⁸ but also through favouring the emergence of a strongly market oriented economy, an issue we examine below in the gravity framework.

Gravity equation specification

Our empirical strategy is based upon the well-known gravity equation¹⁹, which has been recently used by Rose (2003) for assessing the effect on international trade of the WTO, IMF and OECD. One can measure the impact of institutional variables through qualitative variables and running cross section procedures, but this is likely to provide with biased estimates, by not taking into account non-observable variables, like cultural, linguistic, and historical ties. We rely in this paper upon a rich panel characterised by a very large fluctuation of institutions across countries and over the nineties. This panel structure of the data-set eliminates any bias occurring from omitted (time-invariant) variables and which could “pollute” the variables of interest. Furthermore, the focus is put on changes from protectionism and a limited amount of economic freedom to an increasing level of markedly determined behaviours, which is expected to translate into more trade integration.

According to the gravity equation, bilateral trade depends upon a variety of “structural” factors, among which are both nations’ market size, measured by their national products. The gravity equation provides a natural benchmark to which a number of other explanatory variables can in turn be added. In this paper two sets of additional variables are taken into account. One set is made of institution variables²⁰, whose effect on trade we seek to measure. The second set is made of dummy variables, set equal to one when countries are members of a given bloc. In practice the following basic specification is used:

$$\text{LnTrade}_{ij} = \alpha_0 + \alpha_1 \text{LnGDP}_i + \alpha_2 \text{LnGDP}_j + \alpha_3 \text{VOL} + \alpha_4 \text{LnDIST}_{ij} + \sum_{k=1}^{10} \alpha_k \text{INST}_i^k + \sum_{k=1}^{10} \alpha_k \text{INST}_j^k + \sum_{l=1}^9 \alpha_l \text{DUMMY}_l + \varepsilon_{ij}$$

¹⁸ For an estimate based on computable general equilibrium model (called GTAP) of the benefits Russia may realise from entering the WTO, see the White Book (2002), and Stern (2002).

¹⁹ Usually presented as a successful but empirical tool of international trade, the gravity equation is actually provided with many theoretical explanations: the first are Tinbergen (1962) and Anderson (1979); Bergstrand (1985 and 1989) emphasises the micro gravity foundations; Helpman and Krugman (1985) highlight the relationships between market structure and trade; Deardoff (1998) proposes an exhaustive review of the literature; and finally Redding and Venables (2000) and Eaton and Kortum (2002) establish the link between the New Economic Geography and the gravity framework.

²⁰ Data can be found at the following address: <http://database.townhall.com/heritage/index/indexoffreedom.cfm>

where LnTrade_{ij} denotes the bilateral trade, that is the natural logarithm of exports of country i from country j in thousands dollars. Bilateral trade flows, in thousands constant dollars, come from the Chelem-CEPII dataset. Missing values are filled in using IMF-DOTS and Goskomstat Rossijskoj Federatzii. LnTrade_{ij} depends upon:

The market size of country i (respectively j) is measured as the log of real GDP in PPP. Data come from Chelem-CEPII and IMF World Economic Outlook (for Slovenia).

Transportation costs are proxied by the log of distance (LnDIST) between capitals, considered as representing the economic centres. For taking into account possible bias for countries like the United States, Canada and Russia, which are big countries and as such are likely to have multiple economic cores, we considered distances from several economic centres. The data for distances were collected from the CEPII database.

Distance entails not only transportation costs, but also infrastructure, which has a big impact on transportation costs²¹. Unfortunately we cannot include infrastructure because it would imply a large reduction of our sample due to the large number of missing values for some countries. For instance, the widely used Database of World Infrastructure Stocks by David Canning²² provides data from 1950 up to 1995, and for what regards transition countries it encompasses former territories and former political blocs, like the Soviet Union. By putting the stress on those countries whose geography and political borders have changed dramatically we cannot include the latter variable, for which the data have not been updated. Finally even if infrastructure has a significant impact on trade, we assume that it does not vary over a short period of time and can be treated as a fixed effect.

VOL , the bilateral exchange rate volatility, is calculated as the standard deviation of the ratio of the monthly exchange rate over its yearly average²³. Data come from the Pacific Exchange Rate Service (for the EU, China, Kazakhstan), from the Central Bank of Russia for Kazakhstan over the period 1994-1997, and from the IMF for other countries in the sample. Exchange rate volatility is not necessarily correlated negatively with trade flows: it can be seen either as an additional transaction cost or as a way of absorbing asymmetric shocks, and the sign of the correlation is a matter of empirics²⁴.

²¹ See, Bruny, Carrère, Guillaumont, and de Melo (2002), Djankov and Freund (2000), and Bougheas Demetriades and Morgenroth (1999).

²² The World Bank provides a database, The World Development Indicators, which ends up in 1999. Our data cover the period from 1994 to 2001.

²³ According to the following formula: $VOL = \sigma [(e_{ij} - e_{avg}) / e_{avg}]$, where σ is the standard deviation.

²⁴ See IMF (1984) estimation of 42 gravity equations, where exchange rate volatility has a positive influence on trade in 26 cases (for a total of 42); Brada and Mendez (1988), who assert that the manipulation of exchange rate

To measure the degree of State intervention in the economy and the role of institutions we use the Index of Economic Freedom. This index is composed of “the factors that most influence the institutional setting of economic growth”²⁵. While it was computed for measuring economic freedom around the world and for emphasising the empirical strong correlation between freedom and growth, here the focus is put on the causality running from institutions to trade.

INST_i (Institutional score in country i) is an index varying from 1, which corresponds to the lowest level of State Intervention, to 5, which denoted the lowest level of freedom. The ten variables identify the consistency of institutional arrangements and policies with economic freedom in ten major areas²⁶. The variables are therefore as follows:

- *INST1 = Trade Policy*, an indicator measuring tariff and non-tariff barriers, obviously reduces trade;
- *INST2 = Fiscal Burden of Government*, the larger the public share of the economy, the lower the trade volume;
- *INST3 = Government intervention* in the economy: here the link with trade is not so evident, but we believe that market incentives for trading are much lower when the State plays a predominant role in the economy;
- *INST4 = Monetary Policy* measured through the inflation rate: like volatility, inflation is expected to be negatively correlated with trade;
- *INST5 = Capital Flows and Foreign Investment*: measuring restrictions on foreign business. FDI might play an important role in transition countries insertion into the world economy: this is the case in Hungary, where foreign companies invest in the country to serve the domestic market or to benefit from low input costs (wage costs) and re-export towards the home country. In both case, legislation on FDI is likely to have an impact on bilateral trade flows intensity;
- *INST6 = Banking and Finance*: all restrictions on credit and finance obviously tend to hinder foreign trade.
- *INST7 = Wages and Prices*: more freedom from government influence and higher labour market flexibility favour absolute advantage based on low wage costs. Regarding regulation of prices, it is clear that imposing for instance low prices on energy must be accompanied by strict measures of trade controls.

fluctuations by relaxing the external constraint favours trade; for the rationale behind the ambiguous impact of exchange rate volatility on trade, see Flandreau and Maurel (2001) and Maurel (2002).

²⁵ For more details see Annual Report of Economic Freedom of the World

²⁶ Trade policy, Size of government, Monetary policy and Price stability, Capital flows and Foreign Investment, Banking and Finance, Legal structure and Security of private ownership, Freedom to trade with foreigners and Freedom of exchange in capital markets, Size of the black market. Data come from the Heritage Foundation,

- *INST8 = Property rights*: we expect violation of creditor rights, poor enforcement of international law, unfavourable climate for business activities to affect both domestic and foreign activity;
- *INST9 = Regulation and Corruption* within the bureaucracy, licensing requirements to operate a business are likely to discourage potential trade partners. Notice that this variable includes also other components, like labour regulations, environmental, consumer safety, and worker health regulations, whose impact on trade is far from direct.
- *INST10 = Black Market*. To the extent that trade statistics represent trade registered officially, a high level of unofficial trade not captured through official agencies may well affect negatively reported trade flows. Moreover, capital flights, import duty fraud, income tax evasion, or money laundering, more or less linked to the phenomena of illegal and black activities, can lead to abnormal pricing in international trade²⁷.

Finally, bloc dummies are used to identify the various regimes involved. EU-EU captures the EU trade bias, CEEC-CEEC the bias in trade within CEECs, CIS-CIS the CIS bias; X-Y is set equal to one when country i is member of the bloc X and j member of the bloc Y²⁸. It reflects the extent to which a trade diversion effect may possibly occur²⁹.

We dropped the usual “population” variable. As a rule, population appears with a negative sign which is interpreted as the influence of the development level (the wealth of nations) on trade, or is included as a part of an “economic distance” argument; in the first case, if the development level is measured by the GDP per capita, then the population variable will be negatively related to trade; in the second case, countries with very different GDP per capita are considered “economically distant” and will trade less. Without entering the details, we consider that both arguments do not reflect well established theoretical results, and that dropping the population variable is more convenient to reproduce Krugman-Helpman (1985) theoretical framework.

The sample consists of 14 European countries (Austria, Belgium and Luxembourg, Denmark, France, Germany, Greece, Italy, Netherlands, Portugal, Spain, Sweden, United-Kingdom, Finland, Ireland) plus the CEECs (Bulgaria, Hungary, Poland, The Czech Republic, Romania, Slovakia, and Slovenia), the three Baltic States (Estonia, Latvia, Lithuania), Russia, Kazakhstan, Ukraine, Belarus, which

Index of Economic Freedom. The methodology is described in any Annual Report of [Economic Freedom of the World](#), see Annex 1 at the end of the Paper.

²⁷ The bias however works in both directions: imports are over-invoiced, but export are under-invoiced, see de Boyrie, Pak, and Zdanovicz, (2002).

²⁸ X (respectively Y) can be EU, CEECs, CIS, and World, which is the rest of the world.

²⁹ *Trade diversion* means that trade with countries located outside a given region (EU, CIS, CEEC) is below the sample average, because of the existence of formal (suppression of trade barriers) or informal ties within that region. For example, trade within the CIS –according to the gravity estimates - is six times higher than the normal level of trade, while trade between CIS and EU it is three times below the sample average.

constitute the CIS, and the Rest of the World (Brazil, Canada, China, South Korea, Egypt, The United States, the Gulf States, India, Israel, Japan, Norway, Switzerland, Thailand, Turkey). The time span covers the period from 1994 to 2001. The large size of the panel (13 712 observations, despite some limitations on unobservable bilateral flows) provides a basis for consistent estimation and the inclusion of a large number of explanatory variables. A particular emphasis is put on the subset of transition countries, for which institutions, as underlined in a recent paper by Grogan and Moers (2001), can be reasonably expected to be important. While most influential studies to date focus on the importance of macro-economic stabilisation and liberalisation (see Fisher et al. (1996), De Melo et al. (1996)), here we pay attention to the institutional variance across transition countries and over the decade of institutional changes they underwent. In De Sousa and Disdier (2002), a similar emphasis is put on the influence of the legal framework in trade³⁰.

Fixed effects can be included in the equation, which as a result does not necessarily include the traditional distance variable used as a proxy for transaction cost, and excludes as well all time-invariant variables (geography in its broad sense, including distance, adjacency, linguistic and cultural ties, and dummy variables as well). Getting consistent estimates of the time invariant variables requires the use of the Hausman-Taylor procedure, which will be presented below. Annex 2 summarises OLS, GLS, Within and Hausman-Taylor results, which are commented subsequently.

Trade and Institutions: OLS and GLS Results

As can be seen in Table 1, which contains OLS and GLS results, GDP coefficients are between .89 and .87, both significant at 1% level and positive: as expected, trade depends upon supply and demand forces. Distance between economic centres of both countries, which is a proxy for transaction costs, affects negatively trade: more distant countries trade less. For what regards bilateral volatility, the coefficient is negative and significant, which means that higher transaction costs have a negative impact on trade. Bilateral volatility has thus the same effect as a larger distance between two partners.

Table 1: OLS and GLS Results

$LnTRADE_{ij}$	OLS	GLS
$LnGDP_{PPPi}$	0,88*** (0,02)	0,87*** (0,02)
$LnGDP_{PPPj}$	0,89*** (0,02)	0,87*** (0,02)
VOL	-0,20*** (0,06)	-0,12*** (0,03)
$LnDIST_{ij}$	-1,09*** (0,03)	-1,07*** (0,03)

Standard Error are in brackets

*, **, *** define 10%, 5% and 1% significance level respectively. Source: See Annex 3.

³⁰ The border effect model used is quite close to the gravity equation. It is based upon a counterfactual which is: what would be the trade in an economy without border-related barriers, specifically without border barriers related to institutions.

Overall, institutions influence trade in the expected way: more freedom attracts foreign partners and stimulates bilateral trade flows. Higher tariff and non-tariffs barriers (*INST1: Trade Policy*) constitute an impediment to mutual trade. The size of the government (*INST2: Fiscal Burden of Government*) influences negatively the level of trade integration. A legislation which favors activity, by limiting the number of restrictions on foreign ownerships of business and land, on the repatriation of earnings, by treating equally foreign and domestic companies, goes in hand with larger trade volumes (*INST5: Foreign Investment*). The existence of a well-functioning financial and banking system, able to finance efficiently trade business, affects positively and significantly the latter (*INST6: Bank Finance*). The higher wage and price flexibility (*INST7: Wages Prices*), the higher bilateral trade. The stronger the degree of protection of property rights (*INST8: Property Rights*), the higher the incentive to engage in bilateral trade activities. Finally the extent of the *Black Market* (*INST10*) influences trade in the expected way: more informal activity, not registered, influences negatively the level of official, registered trade.

Table 1 (followed): Institutional variables estimates; Dependent variable: *LnTRADEij*

<i>Explanatory Variable</i>	OLS	GLS	<i>Explanatory Variable</i>	OLS	GLS
INST 1i <i>Trade Policy</i>	-0,10 ***	-0,05 ***	INST 6i <i>Bank Finance</i>	0,02	-0,05 ***
	(0,03)	(0,01)		(0,03)	(0,01)
INST 1j <i>Trade Policy</i>	-0,10 ***	-0,08 ***	INST 6j <i>Bank Finance</i>	-0,02	-0,02 *
	(0,03)	(0,01)		(0,03)	(0,01)
INST 2i <i>Fiscal Burden of Government</i>	-0,10 ***	-0,02 *	INST 7i <i>Wages Prices</i>	-0,08 *	-0,12 ***
	(0,03)	(0,01)		(0,04)	(0,02)
INST 2j <i>Fiscal Burden of Government</i>	-0,21 ***	-0,04 ***	INST 7j <i>Wages Prices</i>	-0,13 ***	-0,03
	(0,03)	(0,01)		(0,04)	(0,02)
INST 3i <i>Government Intervention</i>	0,10 ***	0,01	INST 8i <i>Property Rights</i>	-0,16 ***	-0,13 ***
	(0,03)	(0,01)		(0,04)	(0,02)
INST 3j <i>Government Intervention</i>	0,19 ***	0,03 **	INST 8j <i>Property Rights</i>	-0,22 ***	-0,01
	(0,03)	(0,01)		(0,04)	(0,02)
INST 4i <i>Monetary Policy</i>	0,13 ***	0,05 ***	INST 9i <i>Regulation</i>	-0,03	0,01
	(0,02)	(0,01)		(0,04)	(0,02)
INST 4j <i>Monetary Policy</i>	0,03	-0,10 ***	INST 9j <i>Regulation</i>	0,03	0,00
	(0,02)	(0,01)		(0,04)	(0,02)
INST 5i <i>Foreign Investment</i>	-0,02	0,02	INST 10i <i>Black Market</i>	-0,20 ***	-0,11 ***
	(0,04)	(0,02)		(0,03)	(0,01)
INST 5j <i>Foreign Investment</i>	-0,08 *	-0,02	INST 10j <i>Black Market</i>	-0,13 ***	-0,07 ***
	(0,04)	(0,02)		(0,03)	(0,01)

Source: See Annex 3

Some coefficients have the wrong signs or are not significant. One assumption - partially confirmed in Table 2 - is that some of them reflect a degree of economic freedom which is lower (or not very different) in EU countries, and higher in transition countries. As a result bilateral trade flows is positively affected by those institutions. This is the case for *Government Intervention* (*INST3*).

Table 2: Institution scores averaged over countries blocs

	<i>INSTITUTIONS in 2001 averaged across:</i>						
	EU countries	CEECs	CIS	Belarus	Kazakhstan	Russia	Ukraine
INST 1 <i>Trade Policy</i>	2,00	2,20	3,50	3	4	4	3
INST 2 <i>Fiscal Burden of Government</i>	4,43	4,05	3,88	4,5	2,5	4	4,5
INST 3 <i>Government Intervention</i>	2,32	2,20	3,00	3	2	3	4
INST 4 <i>Monetary Policy</i>	1,07	3,20	4,75	5	4	5	5
INST 5 <i>Foreign Investment</i>	1,82	2,10	3,50	4	4	3	3
INST 6 <i>Bank Finance</i>	2,11	2,60	4,00	4	4	4	4
INST 7 <i>Wages Prices</i>	2,14	2,50	3,75	5	4	3	3
INST 8 <i>Property Rights</i>	1,36	2,60	3,75	4	4	3	4
INST 9 <i>Regulation</i>	2,75	2,90	4,25	5	4	4	4
INST 10 <i>Black Market</i>	1,43	3,10	4,50	5	5	4	4

The second reason lies in the multicollinearity between institutional variables. This is the case for *Monetary Policy (INST4)*, which according to Annex 4 is highly correlated with *Property Rights* and *Black Market*. Moreover, the rationale behind the former variable is that monetary policy may entail transaction costs by increasing the cost associated with exchange rate volatility. This effect being already captured with *VOL*, *Monetary Policy (INST4)* can be dropped from the specification. *Regulation (INST9)* is not strongly correlated with the endogenous trade variable; it is indeed a very heterogeneous variable, including not only the licensing requirements to operate a business, but also labour regulations, whose impact on trade is very loose.

The last set of estimates regards dummy coefficients estimates.

Table 1 (followed): dummy estimates

	<i>OLS</i>		<i>GLS</i>		<i>OLS</i>		<i>GLS</i>		<i>OLS</i>		<i>GLS</i>	
	EU				CEEC				CIS			
EU	0,18	***	0,20	**								
	(0,07)		(0,09)									
CEEC	-0,52	***	-0,52	***	-0,42	***	-0,44	***				
	(0,08)		(0,08)		(0,15)		(0,13)					
CIS	-0,92	***	-1,05	***	ns		ns		2,49	***	2,25	***
	(0,13)		(0,10)						(0,25)		(0,28)	
WORLD	ns ^a		ns		-1,35	***	1,35	***	-1,51	***	-1,62	***
					(0,08)		(0,07)		(0,14)		(0,10)	

^a ns – coefficient is not significant and not reported here.

Source: See Annex 3

Table 3: Effective Trade in percent of Potential trade

	<i>OLS</i>		<i>GLS</i>		<i>OLS</i>		<i>GLS</i>	
	EU		CEEC		CIS			
EU	120%	122%						
CEEC	59%	59%	66%	64%				
CIS	40%	35%	–	–	1206%	949%		
WORLD	–	–	26%	26%	22%	20%		

Source: From table 1, Authors Computation

An EU-EU estimate of 0.18 (0.20) implies that trade within EU³¹ is 120% (122%) above its potential level³². In the case of EU this extra trade, which can be called *trade creation*, does not occur at the expense of the trade with the Rest of the World. From the dummy *World-EU* indeed, we can infer that effective trade is not significantly different from what it would be in the absence of a privileged trade area. In other words the counterpart of the trade creation effect, traditionally called *trade diverting effect*, is not significant.

Contrary to what happens in the EU, trade within CEECs is higher than the level, which would imply demand, supply forces, and geography, but at the expense of CEECs trade with EU and with other countries. Finally, trade within the CIS is between 9 and 12 times what it would be if it were "normal"; with the rest of the world, it is lower than expected. Those orders of magnitude are obviously unbelievable, and suggest that the procedure is too simplistic for delivering results reliable enough.

Towards more reliable estimates of the bloc effect: Panel Data procedures

For explaining the huge impact of being member of the CIS on trade, one can resort to at least three explanations. The first explanation emphasizes the aggregation bias. Nitsch (2002) in a paper whose primary focus is the effect of currency unions on trade, argues that the latter must be disentangled: unilateral currency unions do not behave the same way as multilateral currency unions. Melitz (2001) emphasises that the political dimension of a currency union adds something, which must be taken into account; Otherwise, putting everything together may produce biased estimates of the pure currency union effect. The same line of reasoning can be found in Klein (2002), who distinguishes countries, which dollarized their economy, from other countries in the sample. For what regards the issue of CIS trade, by summing up bilateral trade flows between Russia and other CIS from one hand, and between CIS excluding Russia from the other hand, one hides two facts: first, effective trade within CIS is highly depressed, hence 40 times higher implies an absolute value which is not necessarily very high; second, bilateral trade flows may be well above their normal level for what regards trade with the Russian core, an inheritance of the dependency structures in former CMEA³³, while peripheral or radial trade between Ukraine and Belarus would not significantly differ from its normal level.

Persson (2001) stresses that if there is a non-linear relationships between a bloc dummy variable and other variables of the gravity equation, then the dummy coefficient may capture the impact of this non linear effect, and may be over-estimated. In order to avoid any such bias, he proposes to introduce a

³¹ This extra trade can be called *trade creation effect*, which traditionally refers the trade generated by the decrease in internal tariffs. Here we assume that the trade creation effect is generated by a level of trade barriers - below or above the sample level - in a much broader sense. The extra trade within the CIS is due to the inheritance of former historical and political ties for instance.

³² Potential trade: the trade level above what it would be if it was determined solely by the gravity forces, above what it would be if EU countries were not differing from the remainder of the sample.

control group sharing the same characteristics than the countries, which belong to a currency union. This control group is determined by a propensity score, which is the probability of being selected in the bloc group, as a function of the explanatory variables. Comparing country-pairs within and outside the control group allows estimating the effect of the bloc on trade flows.

The last explanation rests on the possibility that unobservable variables are omitted³⁴. For addressing the bias induced by the correlation between omitted and bloc dummy variables, one is faced with the following three options: either (i) estimate a system of simultaneous equations, where explanatory variables correlated with the residual are endogenously determined in a separate equation, or (ii) instrument the explanatory variables responsible for the problem of endogeneity, or (iii) introduce all possible (but time-invariant) omitted variables through dummy variables set equal to one when the pair (i,j) is considered. For what regards bloc dummy variables the first option is illustrated in Tenreyro (2001)³⁵, or Flandreau and Maurel (2001); the second option can be found in Flandreau and Maurel (2001) and Maurel (2002); the third and last option, which is equivalent to introduce fixed effects, is illustrated in Pakko and Wall (2001), Rose and Van Wincoop (2001), and Maurel (2002). For what regards institutions, one addresses the endogeneity problem by trying to capture the exogenous source of variation in institutions like settler mortality (see Acemoglu, Johnson and Robinson (2001)) or fraction of the population speaking English or French (see Hall and Jones (1998), or Dollar and Kraay (2002)).

In what follows we exploit both the cross-section and dynamic dimensions of our panel data set, that is we use, as in option (iii), fixed effect estimates. This traditional technique, which eliminates the individual effects in the sample by transforming the data into deviations from their individual means, may have two important drawbacks. All time-invariant variables are eliminated by the transformation, so that we cannot estimate the bloc dummy we are interested in³⁶; Under certain circumstances, the within-group estimator is not fully efficient since it ignores variation across individuals in the sample. Hausman and Taylor (1981) basically show that if the fixed effects are not correlated with a subset of explanatory variables, then the time-invariant variables coefficients can be consistently and efficiently estimated (for a presentation of this method, see Annex 2). The procedure basically consists in regressing all time-invariant variables on time-variant exogenous variables, then in using the new variables in a model with fixed effects. This procedure combines the advantages of taking into account

³³ See Graziani (1981).

³⁴ This explanation is latent already in the aggregation argument, which recommends splitting the variables into disaggregated ones, that is to focus on more specific bilateral dyads. Ideally indeed, this process of splitting should end up with the construction of a dummy variable for each pair (i,j).

³⁵ She estimates simultaneously a selection model for the formation of a currency union and a gravity equation. This allows taking into account the problem of simultaneity, for properly assessing the impact of the currency union on the intensity of bilateral trade flows.

³⁶ Notice that *within* estimates allow assessing the impact of institutions on growth, since institutions are varying over time.

the fixed effects and keeping in the equation the time-invariant variables whose impact on trade we want to estimate. It is used in Julie Lochard (2002) for assessing the effect of a currency union on bilateral trade flows. Peter Egger (2002) argues convincingly that the most consistent and efficient way of estimating the gravity equation is that proposed by Hausman and Taylor AR(1). We therefore run the Hausman Taylor procedure, even though the time span is too short for taking into account the first order auto-correlation of residuals. The first step consists is determining which variables (time invariant and time varying) are exogenous and as such can be used as instruments³⁷. This is done in the following table:

	Not correlated to the specific effect	Correlated to the specific effect
Vary across time	X1: Fiscal Burden of Government, Government Intervention, Foreign Investment, Bank Finance, Regulation, D1994 – D2000 k1 = 17	X2: LnGDPi(j), VOL, Trade Policy, Monetary Policy, Wages Prices, Property Rights, Black Market k2 = 13
Do not vary across time	Z1 = LnDISTij, EU-EU, CEEC-CEEC, CIS-CIS, CEEC-CIS, EU-CEEC, EU-CIS, WORLD-EU, WORLD-CEEC, WORLD-CIS g1 = 10	Z2 g2 = 0

We consider that certain institutional variables are (more likely to be) correlated with the residuals and omitted fixed effects. It may be because increases in trade openness lead to a demand for and realization of better institutions, that is more open *Trade Policy*, higher enforcement of *Property Rights*, and lower share of *Black Market*. Indeed the probability for *Trade Policy* to be endogenously determined by the degree of trade openness, that is by the country's dependency to foreign markets and the country's sensitivity to changes in its own relative competitiveness, is higher than for other institutions, more exclusively concerned with internal policy. For *Property Rights* there are also good reasons to be concerned about the problem of reverse causation: *Property Rights* include the commercial code defining contracts, the sanctioning of foreign arbitration of contract disputes, and more generally the protection of property rights, whether foreign or domestic. Similarly, the share of the *Black Market* in the whole economy may well be influenced by the frequency and intensity of foreign trade flows. Market size (*LnGDP*) is often considered in the literature as being determined by external trade, which is one of the GDP components indeed; the same line of reasoning can be found in the growth literature³⁸.

Given that the identification condition is trivial³⁹, we could easily run sensitivity analysis to the number of institution variables included in each category. We included *VOL*, bilateral exchange rate volatility, in the category of variables correlated with the specific effects. The final decision rested

³⁷ Because they are not significant or have the wrong sign, we dropped the following variables: *Fiscal Burden of Government, Government Intervention, Monetary Policy, Regulation*.
³⁸ See David Dollar and Aart Kraay (2002) for instance.
³⁹ See Annex 2: g2 = 0.

upon a test comparing *within* and Hausman-Taylor estimates and requiring that the latter should not differ too much from the former.

Table 4 below reports within and Hausman-Taylor results. Estimates called HTIV II are derived from a gravity specification, where all non significant (or with the wrong signs) institutional variables are dropped. Estimates called HTIV I instead encompass the ten institutional variables.

Market size elasticity is lower than in Table 1 for country j and about 7-10% percent higher for country i, while the distance coefficient goes down, from -1.09 (-1.06) to -1.05 (-0.94). This latter figure is more similar to the figure usually reported in the gravity literature. The *VOL* coefficient is remarkably stable across the different procedures.

Table 4: Within and Hausman-Taylor Results

<i>LnTRADE_{ij}</i>	Fixed Effects	HTIV I	HTIV II
<i>LnGDP_{pppi}</i>	0,92 *** (0,09)	0,87 *** (0,07)	0,97 *** (0,08)
<i>LnGDP_{pppj}</i>	0,65 *** (0,09)	0,55 *** (0,07)	0,75 *** (0,08)
<i>VOL</i>	-0,10 *** (0,03)	-0,11 *** (0,03)	-0,11 *** (0,03)
<i>LnDIST_{ij}</i>		-0,94 *** (0,07)	-1,05 *** (0,07)

Source: See Annex 3

Institutions matter again. Compared to OLS or GLS estimates, new elasticities are generally lower, but still significant. They will be used for computing the impact of a change in institutions, towards the EU average for instance, on bilateral trade.

Table 4 (followed): Institutional variables estimates; Dependent variable: *LnTRADE_{ij}*

<i>Explanatory Variable</i>	Fixed Effects	HTIV I	HTIV II	<i>Explanatory Variable</i>	Fixed Effects	HTIV I	HTIV II
INST 1i <i>Trade Policy</i>	-0,03 *** (0,01)	-0,04 *** (0,01)	-0,02 ** (0,01)	INST 6i <i>Bank Finance</i>	-0,06 *** (0,01)	-0,06 *** (0,01)	-0,06 *** (0,01)
INST 1j <i>Trade Policy</i>	-0,06 *** (0,01)	-0,07 *** (0,01)	-0,07 *** (0,01)	INST 6j <i>Bank Finance</i>	-0,02 (0,01)	-0,03 ** (0,01)	-0,03 ** (0,01)
INST 2i <i>Fiscal Burden of Government</i>	0,00 (0,02)	-0,01 (0,01)		INST 7i <i>Wages Prices</i>	-0,12 *** (0,02)	-0,12 *** (0,02)	-0,09 *** (0,02)
INST 2j <i>Fiscal Burden of Government</i>	-0,02 (0,02)	-0,03 * (0,01)		INST 7j <i>Wages Prices</i>	0,06 ** (0,02)	0,04 * (0,02)	0,002 (0,02)
INST 3i <i>Government Intervention</i>	0,00 (0,01)	0,00 (0,01)		INST 8i <i>Property Rights</i>	-0,12 *** (0,02)	-0,12 *** (0,02)	-0,09 *** (0,02)
INST 3j <i>Government Intervention</i>	0,02 (0,01)	0,02 (0,01)		INST 8j <i>Property Rights</i>	0,09 *** (0,02)	0,07 *** (0,02)	0,02 (0,02)
INST 4i <i>Monetary Policy</i>	0,04 *** (0,01)	0,04 *** (0,01)		INST 9i <i>Regulation</i>	0,02 (0,02)	0,01 (0,02)	

INST 4j <i>Monetary Policy</i>	-0,11 *** (0,01)	-0,11 *** (0,01)	INST 9j <i>Regulation</i>	-0,02 (0,02)	-0,02 (0,02)
INST 5i <i>Foreign Investment</i>	0,03 (0,02)	0,02 (0,02)	INST 10i <i>Black Market</i>	-0,09 *** (0,01)	-0,09 *** (0,01)
INST 5j <i>Foreign</i>	-0,01 (0,02)	-0,01 (0,02)	INST 10j <i>Black</i>	-0,05 *** (0,01)	-0,04 *** (0,01)

Source: See Annex 3

For what regards dummy coefficients as compared to former estimates, everything is different. The only exception is the EU-EU and EU-CEEC dummy coefficient: trade within EU is, as earlier, higher than what it would be without the existence of the European privileged trade area, and the order of magnitude did not change significantly. EU-CEEC trade is below its “normal” level by 42% (that is 100% – 58%) and is stable too.

Table 4 (followed): dummy estimates

<i>HTIV II</i>	EU	CEEC	CIS
EU	0,35 ** (0,17)		
CEEC	-0,54 *** (0,17)	-0,62 ** (0,28)	
CIS	-1,18 *** (0,19)	Ns	1,87 *** (0,52)
WORLD	ns^a	-1,46 *** (0,16)	-1,81 *** (0,18)

^a ns – coefficient is not significant and not reported here.

Source: See Annex 3

In Table 5 we computed effective trade as a percentage of potential trade⁴⁰. Several striking facts are worth mentioning: trade within CIS is about six times what it should be, while CIS trade with other countries is very much depressed: with the rest of the world (with EU), CIS trade flows stand at only 16% (31%) of their normal level. But with CEECs, that is former CMEA countries, CIS flows do not differ from their expected level. This dual result points to a well-known phenomena characterising the former Soviet Union trade, called the *trade destruction effect* by Pelzman (1977), which exhibits some persistence today: trade within FSU is higher than what it should be but at the expense of very high tariff and non tariff barriers against non former CMEA countries. Orders of magnitude are much more reliable than those found in the earlier section.

⁴⁰ The ratio of potential trade on effective trade is set equal to the exponential of the dummy bloc variable coefficient. For instance the potential trade of entering the EU is $\exp(0.35)$, that is 142%, because being member of the EU implies an extra trade of 42%.

Table 5: Effective Trade in percent of Potential trade

<i>HTIV II</i>	EU	CEEC	CIS
EU	142%		
CEEC	58%	54%	
CIS	31%	–	648%
WORLD	–	23%	16%

Source: Table 4 and Authors Computation

According to table 5, there is a significant potential for CEECs regional trade increase, for CEECs-EU trade as well as for CEECs trade with other countries in the world. This can be explained by the fact that we took GDP in Purchasing Power Parity, which are significantly larger than official estimates based upon markedly determined exchange rates, and which proxy the market size long run potential of those countries. As a result the trade potential is higher, which implies a ratio of effective to potential trade lower than unity.

According to table 5, trade within CIS should decrease by six times, while trade between CIS and EU should increase by about three times⁴¹.

What would be trade if transition institutions were converging towards EU ones?

Table 2 reports institutional variables scores averaged across three sub-samples of countries. Those scores, as expected, are generally higher for transition countries, where the institutional quality is also lower. It must be recognised however that at the eve of EU enlargement, a very efficient process of convergence of CEECs institutions towards EU ones has taken place. Except *Black Market*, *Property Rights*, and *Monetary Policy*, where CEECs institutional scores are higher by respectively 54% 48%, and 67% as compared to EU scores, the institutional differences are not huge, contrary to what happens we one compares CIS with EU institutions (see table 6).

Table 6: How far are institutional scores in transition countries higher than in EU countries?

	CEECs	CIS
INST 1 <i>Trade Policy</i>	9% ^a	43%
INST 2 <i>Fiscal Burden of Government</i>	-9%	-14%
INST 3 <i>Government Intervention</i>	-6%	23%
INST 4 <i>Monetary Policy</i>	67%	77%
INST 5 <i>Foreign Investment</i>	13%	48%
INST 6 <i>Bank Finance</i>	19%	47%
INST 7 <i>Wages Prices</i>	14%	43%
INST 8 <i>Property Rights</i>	48%	64%
INST 9 <i>Regulation</i>	5%	35%
INST 10 <i>Black Market</i>	54%	68%

Source: See Table 2; Authors Computations

^a : For reaching the EU average score, CEECs Trade Policy must decrease by 9%.

⁴¹ Indeed, $1/\exp(-1.18)=3,25$.

The room for institutional convergence towards better institutional quality implies a potential for trade increase, which can be assessed by comparing the effective trade with what the trade would be if institutions in CEECs (k or $k' = \text{CEECs}$) or CIS (k or $k' = \text{CIS}$) were at the EU level (k or $k' = \text{EU}$). Assume for instance that the score for *Trade Policy* is set equal to 2 instead of 3,5, in CIS countries. In as much as *Trade Policy* has a negative impact on bilateral trade flows, this decrease from 3,5 to 2 can be expected to induce an increase in trade (in logarithms) ΔLnTrad .

The algebra for calculating the increase in trade following an institutional improvement is straightforward:

$$\Delta \text{LnTrad} = \alpha_k (\text{INST}_i^{k=k(\text{EU})} - \text{INST}_i^{k=k(\text{CIS})}) + \alpha_{k'} (\text{INST}_j^{k'=k'(\text{EU})} - \text{INST}_j^{k'=k'(\text{CIS})})$$

$$\Leftrightarrow \exp(\Delta \text{LnTrad}) - 1 = \exp\{\alpha_k (\text{INST}_i^{k=k(\text{EU})} - \text{INST}_i^{k=k(\text{CIS})}) + \alpha_{k'} (\text{INST}_j^{k'=k'(\text{EU})} - \text{INST}_j^{k'=k'(\text{CIS})})\} - 1$$

Where $\exp(\Delta \text{LnTrad}) - 1$ represents the potential increase in trade implied by a move from the initial institutional scores towards new values. Tables 7a and 7b below report the breakdown of this potential increase in trade:

Table 7a: Impact of institutional improvement on trade

	Potential increase in trade ^a					
	(in percent)					
	CIS	EU ^b	CEEC	EU ^b	CIS	CEEC ^b
<i>Trade Policy</i>		15,0		1,9		12,9
<i>Bank Finance</i>		17,9		4,4		13,0
<i>Wages Prices</i>		15,4		3,2		11,8
<i>Property Rights</i>		23,5		11,6		10,7
<i>Black Market</i>		50,9		25,1		20,6
TOTAL		122,7		46,2		68,9

^a: Trade increases calculus is based on **HTIV II** gravity's estimates of Table 4;

^b: "X Y" means that institutions in X are set equal to institutions in Y;

The move from CIS institutions towards EU institutions implies a 122% increase in trade. Much of this percentage (50.9%) is due to the decline in the Black Market, followed by the improvement in the protection of Property Rights⁴² (23,5%). For what regards CEECs, the benefit which can be expected from the EU institutional catching-up is lower, because the room for institutional improvement is narrower. Nevertheless, trade can potentially increase by about 46%. A very few percentage is due to trade policy, which is not surprising given the European agreements signed over the previous decade which succeeded in cutting off all tariffs and non tariffs barriers (except in certain sensitive sectors);

⁴² Guriev, Makarov and Maurel (2002) show at the firms level that the violation of property rights and the low enforcement of creditors rights are responsible for the increase in the virtual (or barter) economy. The latter is not neutral on the level of economic efficiency and output equilibrium, which are lower than in a well-functioning market economy.

the bulk of the increase comes from strengthening property rights (11,6%) and reducing the scope for black market transactions (25,1%).

A similar exercise has been done by Daniel Piazolo (1999). In analysing the process of Central Eastern European candidate countries in the approximation of laws, he argues that transition countries can enhance economic growth through EU-induced institutional changes. The institutional convergence towards EU norms represents static bonus in GDP of 13% (24% if one counts induced capital accumulation).

Table 7b: Impact of institutional improvement on trade by CIS country

	Potential increase in trade ^a				Potential increase in trade ^a			
	CIS		EU ^b		CIS		CEEC ^b	
	Belarus	Kazakhstan	Russia	Ukraine	Belarus	Kazakhstan	Russia	Ukraine
<i>Trade Policy</i>	9,8	20,5	20,5	9,8	7,8	18,3	18,3	7,8
<i>Bank Finance</i>	17,9	17,9	17,9	17,9	13,0	13,0	13,0	13,0
<i>Wages Prices</i>	29,0	18,0	7,9	7,9	24,9	14,3	4,6	4,6
<i>Property Rights</i>	26,2	26,2	15,6	26,2	13,1	13,1	3,6	13,1
<i>Black Market</i>	61,3	61,3	41,1	41,1	29,0	29,0	12,8	12,8
TOTAL	144,2	144,0	103,1	103,0	87,8	87,7	52,2	51,2

^a: Trade increases calculus is based on **HTIV** gravity's estimates of Table 4;

^b: "X = Y" means that institutions in X are set equal to institutions in Y;

According to table 7b, Russian and Ukrainian Institutions being slightly better than Institutions in the neighbouring countries, the potentials for trade increases due to institutional improvements turn out to be lower: 103% in Russia and Ukraine against 144% in both Belarus and Kazakhstan.

Table 7c: Impact of institutional improvement on trade by CEEC country

	Potential increase in trade (CEEC = EU) ^a									
	1 st group			2 nd group				3 rd group		
	Estonia	Hungary	Czech Rep.	Poland	Latvia	Lithuania	Slovak Rep.	Slovenia	Bulgaria	Romania
<i>Trade Policy</i>	-8,9	0,0	0,0	0,0	0,0	-8,9	0,0	9,8	20,5	9,8
<i>Bank Finance</i>	-0,9	-0,9	-9,2	8,1	-0,9	8,1	8,1	8,1	8,1	17,9
<i>Wages Prices</i>	-1,3	-1,3	-1,3	7,9	-1,3	-1,3	7,9	7,9	7,9	7,9
<i>Property Rights</i>	5,8	5,8	5,8	5,8	15,6	15,6	15,6	5,8	15,6	26,2
<i>Black Market</i>	7,9	7,9	23,4	23,4	41,1	41,1	23,4	23,4	23,4	41,1
TOTAL	2,7	11,6	18,8	45,3	54,5	54,6	55,0	55,1	75,6	103,0

^a: Trade increases calculus is based on **HTIV** gravity's estimates of Table 4;

"CEEC = EU" means that institutions in CEECs are set equal to institutions in EU;

Table 7c could suggest that delaying the EU accession of the poorest candidate countries, Bulgaria and Romania, which would benefit most from fulfilling the institutional gap – by increasing their trade by respectively 75 and 103% - is not rational on economic grounds. The potential for trade increase is indeed smaller for countries whose institutions are closer to the EU institutions: Estonia, Hungary and

the Czech Republic. The last group contains Poland, Latvia, Lithuania, Slovenia and the Slovak Republic, where the potential increase in trade ranges from 45 to 55%. However, if there is a causation running from better institutions to trade, the other way around works as well, that is, trade openness and the process of EU enlargement itself causes better institutions. It is the resulting endogenous process which justifies that the poorest countries remain outside the EU until they have improved their institutional environment enough for being eligible. In this latter scenario the perspective of EU memberships acts as an external anchor⁴³, which favours the acceleration of growth and the catching-up towards the GDP per head level required for entering the EU.

Conclusion

The objective of this paper was to estimate two sources of potential for trade increases between transition countries and EU countries, at the eve of Russia's accession to the WTO and EU enlargement towards CEECs. The first is induced by the progressive decline in the *trade diversion effect*, and the second is due to institutional improvement. For that purpose, we used the gravity framework which allows to answer the question of the impact of being a member of the former socialist block on bilateral trade flows. One result concerning the former Soviet Union is that trade within CIS can be expected to decrease by six times, while at the same time trade between Russia and EU countries can be expected to increase by three times. EU-CEEC trade is found to be 42% below its "normal" level.

Then, we augmented the gravity equation by adding institutional variables, like the extent to which property rights are protected in partner countries, the share of the black market in the whole economy, or more directly the importance of tariff, non-tariff barriers, and corruption in the customs services. Gravity estimates were subsequently used for computing the extra trade implied by converging towards the EU or equivalently WTO institutional standards: this extra trade reaches 122% of the actual level of trade, and 46% for CEECs. The benefit coming from the EU institutional catching-up is lower in the latter countries, where the room for institutional improvement is also narrower. Those estimates are obtained by applying the procedure introduced by Hausman-Taylor (1981), which allows simultaneously estimating time invariant variables coefficients and taking into account fixed effects. They are based upon a very rich panel dataset, which contains 42 countries, over 8 years, for a total of 13 712 trade flows. The methodology addresses the endogeneity bias which would pollute a more direct way of estimating the impact of institutions on trade.

⁴³ In a model where law enforcement implies coordination problems and multiplicity of equilibria, the accession to the European Union is the second institutional mechanism in Roland and Verdier (1999) that allows eliminating the 'bad' equilibrium. Interestingly, the authors show that accession without conditionality is better than with conditionality because "the latter creates a coordination problem of its own that partly annihilates the positive effects of expected accession".

If there is a clear relationship from better institutions to trade, the other way around certainly works as well, that is, trade openness is likely to influence institutions. Here we would like to conclude by emphasising that trade and institutional quality being mutually reinforcing, trade openness will have an impact on growth only if institutions make trade attractive and profitable for all parties, by creating the environment conducive to safe and secure exchanges. We would also give support to those who early in the transition put the stress on the need for institutions building, in the absence of which any program of macro-economic stabilisation following economic liberalisation is deemed to failure⁴⁴.

⁴⁴ See Babetski, Kolev, and Maurel (2002) who show that despite the economic reforms and strong orthodoxy in macro-economic policies, the institutions building weakness explains the relative low performance of the Kyrgyz Republic.

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Annex 1: Economic Freedom of the World

<p>IN 1_{i(j)}</p> <p>Trade Policy</p> <ul style="list-style-type: none"> • Average tariff rate • Non-tariff barriers • Corruption in the customs service 	<p>IN 6_{i(j)}</p> <p>Banking and Finance</p> <ul style="list-style-type: none"> • Government ownership of banks • Restrictions on the ability of foreign banks to open branches and subsidiaries • Government influence over the allocation of credit • Government regulations • Freedom to offer all types of financial services, securities, and insurance policies
<p>IN 2_{i(j)}</p> <p>Fiscal Burden of Government</p> <ul style="list-style-type: none"> • Top income tax rate • Tax rate faced by the average taxpayer • Top corporate tax rate • Government expenditures 	<p>IN 7_{i(j)}</p> <p>Wages and Prices</p> <ul style="list-style-type: none"> • Minimum wage laws • Freedom to set prices privately without government influence • Government price controls • The extent to which government price controls are used • Government subsidies to businesses that affect prices
<p>IN 3_{i(j)}</p> <p>Government Intervention in the Economy</p> <ul style="list-style-type: none"> • Government consumption as a percentage of the economy • Government ownership of businesses and industries • Share of government revenues from state-owned enterprises and government ownership of property • Economic output produced by the government 	<p>IN 8_{i(j)}</p> <p>Property Rights</p> <ul style="list-style-type: none"> • Freedom from government influence over the judicial system • Commercial code defining contracts • Sanctioning of foreign arbitration of contract disputes • Government expropriation of property • Corruption within the judiciary • Delays in receiving judicial decisions • Legally granted and protected private property
<p>IN 4_{i(j)}</p> <p>Monetary Policy</p> <ul style="list-style-type: none"> • Average inflation rate 	<p>IN 9_{i(j)}</p> <p>Regulation</p> <ul style="list-style-type: none"> • Licensing requirements to operate a business • Ease of obtaining a business license • Corruption within the bureaucracy • Labor regulations, such as established work weeks, paid vacations, and parental leave, as well as selected labor regulations • Environmental, consumer safety, and worker health regulations • Regulations that impose a burden on business
<p>IN 5_{i(j)}</p> <p>Capital Flows and Foreign Investment</p> <ul style="list-style-type: none"> • Foreign investment code • Restrictions on foreign ownership of business • Restrictions on the industries and companies open to foreign investors • Restrictions and performance requirements on foreign companies • Foreign ownership of land • Equal treatment under the law for both foreign and domestic companies • Restrictions on the repatriation of earnings • Availability of local financing for foreign companies 	<p>IN 10_{i(j)}</p> <p>Black Market</p> <ul style="list-style-type: none"> • Smuggling • Piracy of intellectual property in the black market • Agricultural production supplied on the black market • Manufacturing supplied on the black market • Services supplied on the black market • Transportation supplied on the black market • Labor supplied on the black market

Annex 2: Hausman-Taylor Method

Suppose that the model can be written as follows:

$$Y_{it} = X_{it}\beta + Z_i\gamma + \varepsilon_{it} \quad i=1, \dots, N; \quad t=1 \dots T; \quad (1)$$

Where : $\varepsilon_{it} = u_t + u_i + e_{it}$

The Hausman test⁴⁵ rejects the null hypothesis of the absence of correlation between the residuals and certain variables among the X and Z: X2, correlated with the specific effect and varying over time, and Z2, correlated with the specific effect and not varying over time. In other words:

$$E(u_i/X_2, Z_2) \neq 0 \text{ but } E(u_i/X_1, Z_1) = 0$$

	Not correlated to the specific effect	Correlated to the specific effect
Vary across time	X1 (k1)	X2 (k2)
Do not vary across time	Z1 (g1)	Z2 (g2)

This presentation is taken from Julie Lochard (2002); the number of variables is indicated in brackets;

From what precedes, it follows that X2 and Z2 must be instrumented. The list of instruments includes the deviations from the group means of X1 and X2, and the means of X1 and Z1: [QX1, QX2, P̄X1, ēZ1]⁴⁶.

One identification condition is that k1 must be higher than g2; in other words the number of time invariant variables to be regressed on time-variant and exogenous variables must be lower than the number of the latter, which are used as instruments.

The algebra for transforming (and instrumenting) the model is the following:

$$\Omega^{-1/2} Y_{it} = \Omega^{-1/2} X_{it}\beta + \Omega^{-1/2} Z_i\gamma + \Omega^{-1/2} \varepsilon_{it} \quad (2)$$

Where:

$$\Omega^{-1/2} = \theta P + Q = I_{TN} - (1-\theta)P;$$

$\theta = \sqrt{\sigma_{\eta}^2 / (\sigma_{\eta}^2 + T\sigma_{\alpha}^2)}$, T is the number of periods for each country-pairs, σ_{η}^2 and σ_{α}^2 are the variance of the time varying error component and of the specific effect.

⁴⁵ Reported in Annex 2.

⁴⁶ P denotes the operator, which transforms the variables into their individual means; Q denotes the operator, which transforms the variables into deviation from the individual means.

Annex 3: Econometric Results

Number of obs. = 13 712
 Number of groups = 1 714
 Obs. per group = 8

42 Countries
 8 Years: 1994 - 2001, Balanced Panel

<i>LnTRADE_{ij}</i>	OLS	GLS	Fixed Effects	HTIV I	HTIV II
<i>LnGDP_{pppi}</i>	0,88*** (0,02)	0,87*** (0,02)	1,01*** (0,09)	0,87*** (0,07)	0,97*** (0,08)
<i>LnGDP_{pppj}</i>	0,89*** (0,02)	0,87*** (0,02)	0,41*** (0,09)	0,55*** (0,07)	0,75*** (0,08)
VOL	-0,20*** (0,06)	-0,12*** (0,03)	-0,10*** (0,03)	-0,11*** (0,03)	-0,11*** (0,03)
<i>LnDIST_{ij}</i>	-1,09*** (0,03)	-1,07*** (0,03)		-0,94*** (0,07)	-1,05*** (0,07)
EU-EU	0,18*** (0,07)	0,20** (0,09)		0,35** (0,17)	0,35** (0,17)
CEEC-CEEC	-0,42*** (0,15)	-0,44*** (0,13)		-0,97*** (0,28)	-0,62** (0,28)
CIS-CIS	2,49*** (0,25)	2,25*** (0,28)		1,81*** (0,54)	1,87*** (0,52)
EU-CEEC	-0,52*** (0,08)	-0,52*** (0,08)		-0,75*** (0,17)	-0,54*** (0,17)
EU-CIS	-0,92*** (0,13)	-1,05*** (0,10)		-1,27*** (0,19)	-1,18*** (0,19)
WORLD-CEEC	-1,35*** (0,08)	-1,35*** (0,07)		-1,65*** (0,16)	-1,46*** (0,16)
WORLD-CIS	-1,51*** (0,14)	-1,62*** (0,10)		-1,81*** (0,19)	-1,81*** (0,18)

*** - Significant at 1% level
 ** - Significant at 5% level
 * - Significant at 10% level

(Standard error in parentheses)

Annex 3 (followed) : Econometric Results

<i>LnTRADE_{ij}</i>	OLS	GLS	Fixed Effects	HTIV I	HTIV II
INST 1i <i>Trade Policy</i>	-0,10 *** (0,03)	-0,05 *** (0,01)	-0,03 *** (0,01)	-0,04 *** (0,01)	-0,02 ** (0,01)
INST 1j <i>Trade Policy</i>	-0,10 *** (0,03)	-0,08 *** (0,01)	-0,06 *** (0,01)	-0,07 *** (0,01)	-0,07 *** (0,01)
INST 2i <i>Fiscal Burden of Government</i>	-0,10 *** (0,03)	-0,02 * (0,01)	0,00 (0,02)	-0,01 (0,01)	
INST 2j <i>Fiscal Burden of Government</i>	-0,21 *** (0,03)	-0,04 *** (0,01)	-0,02 (0,02)	-0,03 * (0,01)	
INST 3i <i>Government Intervention</i>	0,10 *** (0,03)	0,01 (0,01)	0,00 (0,01)	0,00 (0,01)	
INST 3j <i>Government Intervention</i>	0,19 *** (0,03)	0,03 ** (0,01)	0,02 (0,01)	0,02 (0,01)	
INST 4i <i>Monetary Policy</i>	0,13 *** (0,02)	0,05 *** (0,01)	0,04 *** (0,01)	0,04 *** (0,01)	
INST 4j <i>Monetary Policy</i>	0,03 (0,02)	-0,10 *** (0,01)	-0,11 *** (0,01)	-0,11 *** (0,01)	
INST 5i <i>Foreign Investment</i>	-0,02 (0,04)	0,02 (0,02)	0,03 (0,02)	0,02 (0,02)	
INST 5j <i>Foreign Investment</i>	-0,08 * (0,04)	-0,02 (0,02)	-0,01 (0,02)	-0,01 (0,02)	
INST 6i <i>Bank Finance</i>	0,02 (0,03)	-0,05 *** (0,01)	-0,06 *** (0,01)	-0,06 *** (0,01)	-0,06 *** (0,01)
INST 6j <i>Bank Finance</i>	-0,02 (0,03)	-0,02 * (0,01)	-0,02 (0,01)	-0,03 ** (0,01)	-0,03 ** (0,01)
INST 7i <i>Wages Prices</i>	-0,08 * (0,04)	-0,12 *** (0,02)	-0,12 *** (0,02)	-0,12 *** (0,02)	-0,09 *** (0,02)
INST 7j <i>Wages Prices</i>	-0,13 *** (0,04)	-0,03 (0,02)	0,06 ** (0,02)	0,04 * (0,02)	0,002 (0,02)
INST 8i <i>Property Rights</i>	-0,16 *** (0,04)	-0,13 *** (0,02)	-0,12 *** (0,02)	-0,12 *** (0,02)	-0,09 *** (0,02)
INST 8j <i>Property Rights</i>	-0,22 *** (0,04)	-0,01 (0,02)	0,09 *** (0,02)	0,07 *** (0,02)	0,02 (0,02)
INST 9i <i>Regulation</i>	-0,03 (0,04)	0,01 (0,02)	0,02 (0,02)	0,01 (0,02)	
INST 9j <i>Regulation</i>	0,03 (0,04)	0,00 (0,02)	-0,02 (0,02)	-0,02 (0,02)	
INST 10i <i>Black Market</i>	-0,20 *** (0,03)	-0,11 *** (0,01)	-0,09 *** (0,01)	-0,09 *** (0,01)	-0,09 *** (0,01)
INST 10j <i>Black Market</i>	-0,13 *** (0,03)	-0,07 *** (0,01)	-0,05 *** (0,01)	-0,05 *** (0,01)	-0,04 *** (0,01)

*** - Significant at 1% level
 ** - Significant at 5% level
 * - Significant at 10% level

(Standard error in parentheses)

Annex 3 (followed) : Econometric Results

<i>LnTRADE_{ij}</i>	OLS	GLS	Fixed Effects	HTIV I	HTIV II
Constant	-4,45 *** (0,51)	-5,40 *** (0,41)	-11,11 *** (1,69)	-12,98 *** (1,58)	-0,30 ** (0,12)
Adj. R-sq	0,80				0,18
R-sq: within		0,13	0,14	0,13	
R-sq: between		0,83	0,45	0,49	
R-sq: overall		0,79	0,44	0,47	
sigma_u		0,91	1,76	1,69210	
sigma_e		0,55	0,55	0,55334	
rho		0,73	0,91	0,90339	
Hausman test:					
chi2(30) and (20)		312,65			31,83
Prob>chi2		0,00			0,38
VIF (mean)	2,42				2,86

*** -Significant at 1% level

** -Significant at 5% level

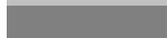
* -Significant at 10% level

(Standard error in parentheses)

Annex 4: Multicollinearity

	In1 <i>Trade Policy</i>	In2 <i>Fiscal Burden of Government</i>	In3 <i>Government Intervention</i>	In4 <i>Monetary Policy</i>	In5 <i>Foreign Investment</i>	In6 <i>Bank Finance</i>	In7 <i>Wages Prices</i>	In8 <i>Property Rights</i>	In9 <i>Regulation</i>	In10 <i>Black Market</i>
<i>In1 Trade Policy</i>	1									
<i>In2 Fiscal Burden of Government</i>	-0,29	1								
<i>In3 Government Intervention</i>	0,25	0,19	1							
<i>In4 Monetary Policy</i>	0,46	-0,15	0,15	1						
<i>In5 Foreign Investment</i>	0,58	-0,43	0,03	0,15	1					
<i>In6 Bank Finance</i>	0,44	-0,19	0,22	0,35	0,46	1				
<i>In7 Wages Prices</i>	0,52	-0,22	0,05	0,40	0,55	0,60	1			
<i>In8 Property Rights</i>	0,63	-0,11	0,38	0,77	0,39	0,53	0,53	1		
<i>In9 Regulation</i>	0,61	-0,06	0,25	0,39	0,37	0,50	0,54	0,63	1	
<i>In10 Black Market</i>	0,56	-0,12	0,26	0,82	0,27	0,44	0,52	0,82	0,45	1

 - correlation [51;63]

 - correlation [77;82]

Assume that our the gravity model can be written in the following way: