

# Trade Policy Options of CIS Countries Twenty Years After

Thesis



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## 1. Introduction

The first of December 2011 marked the 20<sup>th</sup> anniversary of the dissolution of the Soviet Union and proclamation of the fifteen new independent states.

In this time span the former Soviet Union countries faced the troublesome transition process from a planned to a market economy and went through reforms in institutional, political and social spheres. The achieved progress on the path of the democratisation and economic reforms differs much throughout the countries.

The Baltic States were quick to embrace the western values and set their priorities on economic integration with the European Union. Their efforts were rewarded in 2004 when Estonia, Latvia and Lithuania became members of the EU.

The remaining twelve countries needed some more time to formulate their priorities in foreign policies towards each other and the outside world. The dissolution of the Soviet Union brought to some countries the independence which they were very much eager to exert and any kind of dependence on Russia was not welcomed, while other countries wanted to preserve the economic ties which existed before.

Notwithstanding the evident differences in the perception of further cooperation between the new independent states, the eleven countries founded the Commonwealth of Independent States (CIS)<sup>1</sup> in December 1991, primarily announcing future cooperation on equal terms. Two years later, in 1993, countries signed a treaty to create an economic union with the goal of forming a common economic space with free movement of goods, services, labour and capital. Through the years cooperation between the CIS countries was predominantly regulated by numerous bilateral agreements.

Although the far-reaching integration process in the framework of the CIS countries has not yet been achieved, there have been other initiatives to give a form to the regional economic integration between fewer countries.

One of the earliest developments in this direction was the creation of the Commonwealth of Belarus and Russia in 1996 with the goal to create a politically and economically integrated commonwealth. In 2000 a treaty to form the union state was ratified by both countries, but the integration process has been slow.

In 1997 the cooperation between Georgia, Ukraine, Azerbaijan and Moldova has been formalised with the establishment of GUAM<sup>2</sup> – an organisation with the primarily goal to promote establishment of democratic values, stable development and coordination of steps towards European integration.

Another integrating structure in the region - The Eurasian Economic Community (EEC) - was founded in 2000 between Belarus, Kazakhstan, Kyrgyzstan, Russia and Tajikistan with the goal to effectively form a Customs Union. Seven years later, in 2007, Belarus, Kazakhstan and Russia founded the Customs Union which officially came into force in 2010. The three countries planned to remove all custom borders in 2011 and form a single economic space by 2012. Tajikistan and Kyrgyzstan chose a

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<sup>1</sup> To these countries belong: Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan (member through 1991-2004), Uzbekistan and Ukraine. Georgia joined in 1993 and quit in 2009.

<sup>2</sup> Uzbekistan participated through 1999-2005, in this period the organisation carried the name GUUAM.

more cautious approach by awaiting the first results from this cooperation in order to decide if they want to join.

Yet another attempt of economic integration was the creation of The Single Economic Space (SES) in 2003 between Belarus, Kazakhstan, Russia and Ukraine which ceased to be a priority in Ukrainian foreign policies after the Orange revolution in 2004.

The most recent development in the field of CIS integration was the signing of the Free Trade Area Agreement on the 18<sup>th</sup> of October 2011 by eight CIS countries: Armenia, Belarus, Moldova, Kazakhstan, Kyrgyzstan, Russia, Tajikistan and Ukraine. The remaining countries – Azerbaijan, Turkmenistan and Uzbekistan abstained from signing. It remains to be seen whether this agreement makes a difference to the numerous not implemented agreements signed before. By the end of January 2012 not a single country which signed the agreement took the serious effort to ratify it.

The gained independence opened the possibility for the CIS countries to set their own foreign trade policies and regional integration was only one of them.

Integration into the global economy through joining the World Trade Organisation (WTO) is seen as another powerful tool to facilitate trade and boost economic development of a country. The WTO accession of the CIS countries contributes to more equal cooperation with trade partners throughout the world on basis of the non-discrimination principle of the most-favoured-nation. For the CIS countries the membership of the WTO sends a strong signal to the outer world. It shows that a country has implemented required legislation and committed itself to protect and enforce the rule of law, property rights, intellectual property and copy rights. The WTO membership contributes to a country's image as a reliable trading partner.

At the moment five out of twelve CIS countries obtained the WTO membership – Armenia, Georgia, Kyrgyzstan, Moldova and Ukraine. By summer 2012 Russia is expected to become a full member after ratification of the terms of entry by its parliament. The remaining CIS countries, with the exception of Turkmenistan, are in the process of ongoing accession which for some countries started already in 1993. The lack of progress on the required reforms for accession to the WTO may be indicative of other political and trade priorities of the applicant countries.

Another important issue in the foreign policies of the CIS countries is the relationship with the European Union. With the enlargement rounds of 2004 and 2007 the borders of the EU came closer to the CIS countries, making the EU automatically a potentially more important trading partner.

Democratic values and human rights are of great importance for the establishment of closer ties with the European Union. Currently only Moldova and Ukraine are classified as flawed democracies according to the 2010 index of democracy<sup>3</sup> while the remaining CIS countries belong to the authoritarian regimes category. A pro-European choice in the foreign policies of the CIS countries definitely helps to bring the current cooperation with the EU to a higher level.

Presently the EU is negotiating Association Agreements with Armenia, Azerbaijan, Georgia, Moldova and Ukraine which are meant to significantly deepen the political association and the economic

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<sup>3</sup> See The Economist Intelligence Unit's Index of Democracy 2010.

integration with the EU. The largest progress has been made with Ukraine which is technically ready to sign the agreement on the Deeper and Comprehensive Free Trade Area (DCFTA) in the framework of this Association Agreement. However, political developments in Ukraine of the last half year put off the prospect of signing the DCFTA until some unidentified point in future.

The prospect of agreeing on the DCFTA is believed to be positive for the participating CIS countries as it is an excellent opportunity to widen the countries' access to the European single market and to stimulate the European investment in them.

The above mentioned developments regarding the integration initiatives among the CIS countries make it clear that the past 20 years were marked by turbulent search for optimal foreign trade policies which sometimes went hand in hand with political re-orientation of the countries.

Although the political component very often plays a decisive role in the trade policies followed by a country, the goal of the present study is to estimate the economic impact in terms of extra export for the CIS countries from the three major trade policy options they can pursue: 1) establishment of an FTA with the EU; 2) becoming a member of the WTO; 3) becoming a new member of the Customs Union between Belarus, Kazakhstan and Russia.

Alongside with the trade related policy options, the present study also focuses on the impact of institutional improvement and infrastructure development on export facilitation for the CIS countries.

The contributions of the present study lie in the simultaneous estimation of the three major trade policy options; the distinction of the direction of export flows between the country pairs which made the identification of the possible trade creation and trade diversion effects with regard to the CIS countries possible; the extensive data period of 19 years; the application of a simulation-based technique to analyse the benefits of each CIS country from the improved governance and infrastructure.

The main finding of this study suggests that the CIS countries can give the largest boost to their exports by improving their governance quality. On average, the CIS countries would increase their exports by 97% if they manage to reach the EU15 level of governance. Importance of infrastructure development is the second largest factor which can on average generate another 34% of export increase in case its level approximates that of the EU15. Among the trade policy options, the WTO membership was found to bring about the 22.74% export increase to the CIS countries which are currently non-members. Further integration, either in the direction of the EU in the form of the FTA or Russia in the form of the customs union, was found to exert a positive effect on the exports of the CIS countries: 8.36% increase in the first case and 9.79% in the second.

This study is organised as follows: section two covers the literature overview, section three defines the testable hypotheses, section four is devoted to the econometric model specifications and choice of the best econometric model for this study and section five reports the obtained empiric results. In the sixth section the results from a number of simulations are presented and discussed. The seventh section is devoted to conclusions and policy recommendations. The appendix comprises the additional graphs and tables together with the sources of data.

## 2. Literature Overview

The interest for the integration of the transit economies into the global trade has been quite high. Previous studies were mostly devoted to such questions as redirection of trade patterns, trade openness, role of the geographical position, and reforms in institutional and political spheres of the CIS countries. Remarkably enough there has been little attention for the combined quantitative analysis of the trade options of the CIS countries to improve their exports.

This section gives a literature overview in the sequence of the investigated policy options for the CIS countries. The first subsection covers literature related to the estimation techniques applied in this study; the second subsection covers literature related to the direction of trade of the CIS countries and the rest of the world; the third subsection summarises literature on the FTA effects and estimations of the effects of the FTA between the EU and the selected CIS countries; the fourth subsection summarises the studies devoted to the impact of WTO membership on export performance of the countries and the last subsection covers literature devoted to the trade facilitating features of customs unions.

### 2.1 Gravity and estimation issues

The gravity model found many applications in empirical studies of the international trade since its introduction by Tinbergen in 1962. It is still widely used in a number of fields for analysis of the trade flows, FDI flows and migration flows; the *ex post* effects of economic integration agreements like RTA's, FTA's, currency unions; the measure of the "trade costs" inherent in bilateral trade.

Inspired by Newton's Law of Gravity, the basic gravity model relates the bilateral trade flows between two countries positively to their market size and negatively to the bilateral distance between these countries. The gravity model also includes a number of bilateral dummies to capture the impact of the integration blocs or other policy issues. The gravity model is used as a baseline model that predicts the volume of trade between the countries and the impact of policy issues is measured as deviations from the baseline predictions which refer to the normal level of trade.

The simplicity of the model, its high explanatory power and relevance for policy-makers regarding the impact of integrating activities ensured the wide acceptance of the model among international economists.

Attention to the border effect in international trade was drawn by the study of McCallum (1995) who analysed the cross-provincial trade in Canada and international trade between the Canadian provinces and the states of the USA. The data used in the analysis refers to the year of 1988 – the year of signing the FTA between Canada and the USA. The surprising result of the study was that the Canadian provinces were found to trade 22 times (2,200 percent) more between each other than they traded with the states of the USA. This effect was quite puzzling as a border effect of such magnitude was difficult to place.

Anderson (1979) was the first who successfully solved this border puzzle by addressing the role of trade costs. He laid the basis for the theoretical based gravity model assuming constant elasticity of substitution (CES) preferences and goods that were differentiated by the region of origin. Bergstrand

(1985) also addressed the border puzzle by keeping the CES preferences and adding monopolistic competition to the model. Deardorff (1998) applied the Heckscher-Ohlin structure.

Further extension of the theoretical foundations of the gravity model was made by Anderson and Van Wincoop (2003) who added the multilateral resistance variables to the specification of the gravity model. The idea behind the multilateral resistance is that in real life the trade flows between any two countries are influenced by the products' prices in the rest of the world and those prices in their turn are influenced by the bilateral distances between each of those countries to the rest of the world. Therefore the trade between any two countries is determined by relative trade barriers: the bilateral barrier between the two countries relative to the average trade barriers that these two countries experience with the remaining countries in the world. Assuming the differentiation of goods by place of origin, homothetic preferences and equal bilateral trade barriers  $t_{ij} = t_{ji}$ , the gravity equation was defined as:

$$x_{ij} = \frac{y_i y_j}{y^w} \left( \frac{t_{ij}}{P_i P_j} \right)^{1-\sigma}$$

The exports  $X_{ij}$  from country  $i$  to country  $j$  are controlled for the size of the countries: the product of GDPs ( $y_i y_j$ ) relative to the world's GDP ( $y^w$ ) represents the income shares; the exports  $X_{ij}$  are determined by bilateral trade barriers which are represented by the bilateral trade resistance  $t_{ij}$  relative to product of the consumers' price index of the two countries  $P_i P_j$ , which is referred to as "multilateral resistance" indices. The exponent of  $(1-\sigma)$  represents the homothetic preferences.

Anderson and Van Wincoop (2003) show that an increase in multilateral barriers with the rest of the world leads to more trade for exporter  $i$  and importer  $j$ . Higher multilateral trade barriers between exporter  $i$  and the rest of the world raise the trade between exporter  $i$  and importer  $j$  due to the lowered supply price triggered by the lower demand from the rest of the world. Higher multilateral trade barriers between importer  $j$  and the rest of the world raise the trade between importer  $i$  and exporter  $j$  due to the lower relative price of goods from  $j$ .

The fact that the bilateral exports are controlled for the size of countries leads to the asymmetric effects from increase in trade barriers on the exports for large and small countries. In case of two large countries, the trade barriers reduce the size-adjusted trade between them more than in case of two small countries. As for the trade within a country, the trade barriers increase the trade within a small country more than within a large country.

Anderson and Van Wincoop (2003) emphasised that that proper comparative static effects of a national border should be calculated in a full general-equilibrium framework. This means that the cross-provincial trade and cross-border trade should be first both expressed as the ratio of trade with border effects to trade without border effects – in this way the separate border effects for cross-provincial and cross-border trade are defined. Secondly, these two effects should be taken to a ratio which compares the cross-provincial to cross-country trade. Direct comparison of the partial effects of cross-provincial and cross-country trade, as it was done in the McCallum study in case of Canada, was inadequate and led to an exaggerated estimate of the border effect.

Pointing out at the bias due to omitted variables (the multilateral resistance terms) in the McCallum study, Anderson and Van Wincoop (2003) re-estimated the cross-provincial Canadian trade which



turned to be only 10.5 times higher than the cross-border trade, while the intra-American trade was found to be 2.6 times higher than the cross-border trade. As empirical evidence showed, smaller countries experience much larger impact from the border effects.

With the theoretical basis made by Anderson and Van Wincoop the subsequent gravity studies were mostly devoted to the fine-tuning of the estimation techniques or application of other methodologies.

Feenstra (2004) summarises the use of three techniques which can be employed to account for the price effects in the gravity model: 1) the use of price indexes; 2) the use of estimated border effects; 3) the use of fixed effects.

The drawback of the first technique lies in the quite plausible assumption that the published price-index data may not fully reflect the true border costs, besides the price-index data is measured relative to some base period which is arbitrarily chosen. The drawback of the second technique, which was applied by Anderson and Van Wincoop (2003), is the necessity to use the custom non-linear least squares programming which is quite cumbersome.

The appealing simplicity of the last technique is that it can be estimated by ordinary least squares. The fixed effects estimation measures the unobservable multilateral indexes as the “coefficients of source and destination region fixed effects” (Feenstra 2004) and yields consistent estimates of the average border effect across countries. The drawback of the fixed effects estimation is that all region specific variables that do not change over time are being subsumed in the fixed effects. Another drawback of the fixed effects estimation is that it still does not allow producing the region- or country-pair specific comparative statics without construction of a non-linear system of equations to estimate the multilateral price terms with and without the “border” (Baier *et al.* 2010).

Recently a number of alternative estimation techniques of the gravity model have been developed. Baier *et al.* (2009) applied the nonparametric matching estimation to evaluate cross-sectionally the *ex post* long-run effect of a particular economic integration agreement on the level of trade between the pair of countries. Matching econometrics allow estimation of treatment effects without knowing the precise functional relationship, therefore there is no room for bias due to omitted non-linearities as can be the case with the OLS estimation. Next to this, this technique controls for non-random selection into FTA by forming treatment and control groups.

In search of a simplified technique to NLS estimation used by Anderson and Van Wincoop, Baier *et al.* (2010) approximate the exogenous multilateral and world resistance (MWR) terms by a first-order log-linear Taylor-series expansion of the MR terms in Anderson and Van Wincoop and then use the “good old” OLS estimation. This method generates the theoretically motivated general equilibrium comparative statics.

Baier *et al.* (2010) suggest the use of the first-order Taylor expansion to all terms which enter  $P_i P_j$  explicitly. Calculation of the MWR terms uses the simple averages of the trade costs rather than the GDP share weighted as the latter could lead to an endogeneity bias. Baier *et al.* (2010) determined the MWR for the distance and border as follows:

$$\text{MWRDIS}_{ij} = \left[ \frac{1}{N} \left( \sum_{i=1}^N \ln \text{DIS}_{ij} \right) + \frac{1}{N} \left( \sum_{j=1}^N \ln \text{DIS}_{ij} \right) - \frac{1}{N^2} \left( \sum_{i=1}^N \sum_{j=1}^N \ln \text{DIS}_{ij} \right) \right]$$

Subsequently the following gravity equation can be estimated by the OLS:

$$\ln x_{ij} = \beta'_0 - \rho(\sigma - 1) \ln \text{DIS}_{ij} - \alpha(\sigma - 1) \text{BORDER}_{ij} + \rho(\sigma - 1) \text{MWRDIS}_{ij} + \alpha(\sigma - 1) \text{MWRBORDER}_{ij} + \varepsilon_{ij}$$

where  $x_{ij}$  is represented by exports from country  $i$  to  $j$  relative to the product of their GDPs;  $\beta'_0 = -\ln Y^T$  is constant across the country pairs; coefficient estimates for MWR terms have the opposite signs but are restricted to have equal values to the coefficients of  $\ln \text{Distance}$  or  $\text{Border}$ .

Although Anderson (2010) suspects that researchers will be cautious with the use of this method due to possible approximation error, it has already been successfully applied on panel data in a number of studies (Egger *et al.* 2007, Melitz 2008, Nelson *et al.* 2008).

Other estimation issues which can lead to biased estimations in the gravity model are Jensen's inequality  $E(\ln y) \neq \ln E(y)$  and presence of zero trade in the trade flows<sup>4</sup>. Although the interpretation of the obtained estimates from the log-linear models estimated by OLS is usually interpreted as elasticities, Santos Silva *et al.* (2006) argue that the interpretation can be misleading in case of present heteroskedasticity. They advocate for the use of a Poisson Pseudo Maximum-Likelihood (PPML) that also eliminates the problem of zero trade which in the usual log-log form of the gravity equation cannot be considered as the log of zero is not defined. Poisson regression gives less weight to the observations with larger variance and therefore reduces the weight of observations which are prone to measurement error. With regard to the gravity studies related to the CIS countries, the PPML estimator has been applied in the study of policy options for the CIS countries by Babecka-Kucharcukova *et al.* (2010).

Martin *et al.* (2008) recommend using the threshold tobit estimator if zero trade represents a substantial share in the analysed trade flows. Using Monte Carlo experiments they show that the tobit estimator even outperforms the PPML estimator provided heteroskedasticity is properly controlled for. As a solution to zero trade in trade flows, Helpman *et al.* (2008) advocate for the use of the Heckman two-step procedure where in the first step the probability of trade between the countries is estimated by means of the probit estimator and in the second step the volume of trade is estimated by means of the OLS.

Another alternative estimation technique applied in the gravity model is the Hausman-Taylor (HT) instrumental variable method. This method uses some explanatory variables as instruments which allow avoiding the problem of possible correlation of the explanatory variables with the unobservable country-pair effects. Next to this, the HT method allows to derive the estimates for the time-invariant variables like distance, common language or contiguity.

In the present study the fixed effects estimation technique will be applied following Feenstra (2004) who found that this estimation gave the consistent estimates that account for the multilateral resistance terms.

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<sup>4</sup> The share of the zero-trade in the analysed export flows constitutes only 4.03%. Unfortunately the use of Poisson Pseudo Maximum-Likelihood estimation did not lead to meaningful results in the present study.

## 2.2 Trade of CIS and its integration into the world trade

There have been a number of gravity studies addressing the question of integration of the CIS countries into the global trade. The results presented in empirical studies are somewhat hard to compare due to differences in specifications of the gravity models, in applied estimation techniques and in periods covered in the analyses. The findings of a number of studies are presented in table 2.1.

Table 2.1: Overview of the CIS related literature

Author(s)	Analysed Period	Main findings
Fidrmuc <i>et al.</i> (2001)	1992-1998	Trade between Russia, Belarus and Ukraine followed the U-form development: In 1992 – the countries traded 43 times below the normal level In 1998 - the countries traded 30 times above the normal level predicted by the gravity model based on GDPs and distance • Cultural, social and linguistic links would continue to contribute to the more intensive bilateral trade relations between the CIS countries
Babetskii <i>et al.</i> (2003); The EBRD transition report (2003)	1997-2002	<ul style="list-style-type: none"> <li>• In 2002 the CIS countries are highly dependent on intra-CIS trade</li> <li>• Membership of the WTO leads to a 25% increase in bilateral trade between the two members</li> <li>• Conclusion of the FTA leads to a 25% increase in bilateral trade between the participants</li> <li>• Low quality of economic institutions are to blame for the “trade gap” of 60% between the CIS countries and the EU</li> <li>• The CIS trade would almost double if the countries had the same quality of governance as the accession countries to the EU of the 2004 enlargement round</li> </ul>
Koukhartchouk <i>et al.</i> (2003)	1994-2003	<ul style="list-style-type: none"> <li>• The trade between the CIS countries is 6 times higher than it should be based on the gravity model</li> <li>• The CIS countries trade with the rest of the world only 16% of the predicted level, with the EU only 31% of the predicted level</li> </ul>
Elborg-Woytsc (2003)	1993-2002	• In 2001 the CIS countries could have traded 183% more than their actual trade with the EU if their transitional index was similar to that of the CEE+ countries*
Freinkman <i>et al.</i> (2004)	1994-2001	<ul style="list-style-type: none"> <li>• In 2001 the CIS as a group trades according to the gravity model predictions with other CIS countries and the ROW, excluding the USA</li> <li>• Russia and Ukraine booked most progress in diversification of the trade pattern</li> <li>• Armenia, Azerbaijan and Georgia under-trade</li> <li>• Kyrgyzstan, Moldova, Tajikistan, Uzbekistan, Kazakhstan and Turkmenistan overtrade</li> </ul>
Broadman (2005)	1994-2003	<ul style="list-style-type: none"> <li>• Trade between the CIS countries as a group is broadly in line with the gravity model predictions</li> <li>• Kazakhstan, Russia and Ukraine traded as expected</li> <li>• Belarus and Kyrgyzstan were over-trading, Armenia and Georgia were under-trading</li> </ul>
Babecka-Kucharcukova <i>et al.</i> (2010)	1997-2004	<ul style="list-style-type: none"> <li>• Membership of the FTA boosts bilateral trade by 120%; the average trade gain for the CIS countries from the FTA with the EU is 66%</li> <li>• If the remaining CIS countries jointly become a member of the WTO, their total trade would increase by 50%</li> <li>• Improvement of infrastructure in the CIS to the level of the EU15 would lead on average to a 5% extra trade</li> <li>• Improvement of institutional quality of the CIS to the level of the EU15 would lead on average to a 205% extra trade</li> </ul>
Kurmanalieva <i>et al.</i> (2011)	1995-2008	<ul style="list-style-type: none"> <li>• On average the intra-CIS trade is 4.5-10 times than expected by the gravity model</li> <li>• Members in the WTO trade 13% more with each other</li> </ul>

Note: \* The CEE+ countries are: Albania, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, the former Yugoslav republic of Macedonia, Poland, Romania, the Slovak Republic and Slovenia.

As is seen from the overview of the selected literature, a number of researchers (Fidrmuc, Babecka-Kucharcukova, Babetskii, Koukhartchouk, Elborg-Woytec, Kurmanalieva) found evidence for the CIS countries overtrading among each other and / or under-trading with the rest of the world while some (Freinkman, Broadman) found no evidence for CIS countries as a group to be overtrading among each other or under-trading with the rest of the world. The contradicting results may be indicative of the changes in the trade openness and progress in the redirection of trade in the CIS countries throughout the years. It is obvious that on individual level the CIS countries differ in intensity in the intra-CIS trade as well as trade with the EU or the rest of the world.

### **2.3 The role of FTA in the international trade facilitation, application to the CIS**

In the second half of the twentieth century the new regionalism gained more popularity compared to the multilateral trade liberalisation within the GATT framework. The increased number of participating countries in the GATT resulted in complicated and time consuming multilateral negotiations. This led to the rise of the new regionalism – regional economic integration in the form of preferential trade agreements, free trade areas, customs unions, common markets and economic unions.

Currently there are 202 regional trade agreements (RTAs) in force which have been registered by the World Trade Organisation. The overall number is still increasing as there are numerous RTAs under negotiation. Ninety percent of the current RTAs are represented by free trade areas and partial scope agreements; the remaining ten percent is represented by customs unions.

Although regional trade agreements create conditions for freer trade between its members, they also have discriminatory features for non-members. Therefore trade creation and trade diversion effects should be taken into account when judging the total welfare implications of the RTAs.

There have been numerous empirical studies evaluating the *ex post* effect of free trade agreements. Tinbergen (1962) was the first to use the gravity model for determination of the normal trade pattern between countries in case of no trade impediments. He found that the membership of the British Commonwealth led to 5% increase in trade, while Benelux FTA increased trade with 4% between the members.

More recently Baier and Bergstrand (2007) analysed the trade flows of 96 countries in the period of 1960-2000 and found that on average a FTA doubles the trade flow between the two countries after 10 years. They advocated for the estimation of the FTA effects by means of the theoretically-grounded gravity model with the use of panel data with bilateral fixed and country and time effects or differenced panel data with country and time effects. They argued that these panel data techniques properly account for the endogeneity of the trade policies as existence of the FTA between the countries is seen not as an exogenous fact but as a fruit of the trade policies between the countries.

Literature on the possible future effects of the FTAs between the EU and the CIS countries is quite limited. Generally, the arguments for the CIS countries to establish a FTA with the EU will be gaining the improved access to the EU market; gradual improvement of the domestic economic governance;

possible increase in FDI inflow which might seek the possibilities to profit from the relatively cheap labour.

Further integration may also have some negative consequences for the CIS countries such as further specialisation in the export of primary goods; the domestic economy, which broadly needs modernisation, can suffer from inflow of competitive EU products; the foregone of import duties revenues; possible negative trade balance in the short term due to trade liberalisation<sup>5</sup>.

A number of studies addressed the question of the possible welfare implications for the CIS countries from the conclusion of the FTA with the EU. The estimations were done by means of computable general equilibrium (CGE) model. The findings of a number of studies are listed in table 2.2.

Table 2.2: Literature on the impact of the FTA between the EU and selected CIS countries

Author(s)	FTA between	Main findings
Francois <i>et al.</i> (2009)	The EU and the CIS	<ul style="list-style-type: none"> <li>• Conclusion of the full FTA with the EU, which would not be limited only to the reduction of tariffs in goods, would lead on average to a 0.62% increase in the real incomes in the CIS countries.</li> <li>• The impact on the EU would be marginal but positive even in case of the partial FTA.</li> </ul>
Emerson <i>et al.</i> (2005)	The EU and Ukraine	<ul style="list-style-type: none"> <li>• Overall welfare gain for Ukraine from the deep FTA with the EU would be above 10%. This gain would be sourced through new trade accounting for 4-7% and reduction in the cost of capital which could lead to additional 4-5% welfare gain.</li> <li>• The simple FTA was found to lead primarily to changes in the trade structure for Ukraine but not to substantial welfare gains.</li> </ul>
Maliszewska <i>et al.</i> (2008)	The EU and Armenia	<ul style="list-style-type: none"> <li>• The deep FTA is expected to bring welfare gain of 3.38% of GDP.</li> <li>• Additional increase in welfare gain could be achieved in case Armenia would implement comprehensive reforms to fight corruption and create favourable business environment. Total welfare gain sums up to 7.95% of the GDP.</li> </ul>
Jensen <i>et al.</i> (2011)	The EU and Armenia	<ul style="list-style-type: none"> <li>• Armenia would derive gains from the FTA with the EU mainly through trade facilitation, reductions in barriers in services and in border costs and harmonisation of standards.</li> <li>• The estimate of the welfare gain is 2.5 lower compared to the study of Maliszewska <i>et al.</i> (2008).</li> </ul>
Maliszewska <i>et al.</i> (2008)	The EU and Georgia	<ul style="list-style-type: none"> <li>• Total welfare gain from the deep FTA with the EU is 6.5% of the GDP.</li> <li>• Due to FTA conclusion export is expected to increase by 13.5% in five years.</li> </ul>

Impact of the FTA with the EU on the Russian economy received more attention in the literature. The positive impact on the Russian economy was found by Manchin (2004) in case of the conclusion of the deep FTA which would cover services and agriculture as well as reduction of the non-trade barriers. De Souza (2004) concluded that Russia would benefit even from limited FTA with the EU. Simulations of Sulamaa *et al.* (2004) showed that different FTA schemes are beneficial to Russia's output but in order to be positive to welfare, Russia needed to improve its productivity through better institutions or increase of the FDI.

With the quantified possible gains from the DFTA with the EU for the CIS countries in the above listed studies one needs to bear in mind that the main challenge for the CIS countries lies in the willingness and capacity to push the reforms on the governmental, institutional and legislative levels which would make the conclusion of the DFTA more feasible. Conclusion of the FTA with the EU requires broad institutional reforms in CIS countries to approximate domestic legislation to the EU's market

<sup>5</sup> Caporale *et al.* (2011) found that positive effects of Europe Agreements had an asymmetric impact on the trade flows, namely the liberalisation of trade led to a deterioration of the trade balance of the four new member states (Hungary, Poland, Bulgaria and Romania).

law and practice, to protect intellectual property rights, to fight corruption as well as to implement the competition policy.

Findings of studies of the FTA impact on the CEEC can also serve as a proxy of the possible impact of the FTA between the EU and selected CIS countries in terms of export, as CEEC countries had similar initial economic conditions in the early 90s.

Caporale *et al.* (2008) found that for the four Eastern European Countries (Bulgaria, Hungary, Poland and Romania) the FTA with the EU resulted in increased trade by 14%. Ukraine, Belarus and the Russian Federation were used as control countries which did not have the FTA with the EU.

Spies *et al.* (2009) analysed the impact of European Agreements and Interim Agreements between the CEEC and EU on trade. They found that the FTA led to creation of new trade between the members, but for some countries as Czech Republic and Slovakia it went at the cost of the imports from the rest of the world. Conclusion of the FTA with the EU led to an increase of EU imports from the CEEC countries by 72%.

A meta-analysis of the impact of RTAs was done by Cipollina *et al.* (2010) where the results from 75 studies based on developed, developing and transitional economies were investigated. The study concludes that there is a robust positive effect of the RTA of about 30% trade increase. This effect grows in the recent years which reflect the tendency to form “deeper” trade agreements. Cipollina did not find evidence supporting the differentiation of the RTA impact according to the type of trade agreement.

From the above listed literature overview it becomes evident that the happy few CIS countries which are in the process of negotiations with the EU for conclusion of the DFTA might expect positive effects on their trade and welfare.

## 2.4 CIS and WTO

The comment of Sergei Guriev, head of the New Economic School in Moscow, to the news of Russia being very close to joining the WTO underlines the importance of the WTO membership and is applicable to remaining non-WTO CIS countries: “*It will be a sign that Russia is moving towards the civilised world, not away from it*”.<sup>6</sup>

The discourse about the role of the World Trade Organisation (WTO) in trade facilitation was started by Rose (2002) who investigated the impact of the WTO and its predecessor General Agreement on Tariffs and Trade (GATT) on international trade of developed and developing countries. The results from the gravity model estimation using large panel data set of 175 countries over 50 years came as a puzzle to the conventional economic thinking: the membership of WTO/GATT was associated with a statistically and economically insignificant increase in trade. The only large estimate of the GATT membership in the number of specifications led to a 16% increase in trade between the members, which was miserable compared to the 136% increase due to Generalised System of Preferences.

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<sup>6</sup> Article in The Economist, “In at last?”, from the 5<sup>th</sup> of November 2011, available at [http://www.economist.com/node/21536649?src=nlw%7Cwwp%7C11-3-2011%7Cpolitics\\_this\\_week](http://www.economist.com/node/21536649?src=nlw%7Cwwp%7C11-3-2011%7Cpolitics_this_week).

Subramanian *et al.* (2003) refined the analysis of Rose by accounting for the multilateral resistance and for the asymmetries in the trade liberalisation process of the post-war period. According to findings of Subramanian the WTO had a positive and powerful impact on international trade, increasing the members' trade between 14 to 35% in case of industrial countries.

Chang *et al.* (2007) used the original dataset of Rose (2004) and applied non-parametric matching methods to estimate the effect of the WTO/GATT membership. The findings showed a positive effect of 194% of trade increase of the bilateral trade volume between the members of the WTO when unrestricted matching was applied. This effect was reduced to 126% increase when matching within country-couple was applied which took the time-series variation of the effect into account. The potential increase of the bilateral trade volume for the non-members would be 22% in case both countries become a member and 9% in case only one becomes a WTO member.

Extending models of Rose and Subramanian, Eicher *et al.* (2009) suggested that the impact of WTO vanished once the multilateral resistance, unobserved bilateral heterogeneity and effects of the individual Preferential Trade Agreements were introduced into the gravity model.

Bearing in mind the ambiguous empirical results regarding the impact of the WTO on the bilateral trade flows, it is interesting to find out the conclusions of the literature which addressed the question of the transitional economies and the impact of their possible membership of the WTO.

A lot of studies were devoted to estimation of the effects for Russia becoming a WTO member. Lissovolik *et al.* (2004) investigated the influence of WTO membership on Russia's exports by means of a gravity model using a rich dataset of 171 countries through the period of 1995-2002. Russia was found to trade too little with the WTO members. The potentially missing trade was estimated to be in the range of 30 up to 60% due to the non-membership of the WTO. The membership of the WTO was seen as important for gaining access to developed country markets.

Koukhartchouk *et al.* (2003) suggested that Russia's WTO membership would lead to the progressive decline in trade diversion effect and that Russia's trade with the EU was expected to increase by three times. In a more recent gravity study, Kolesnikov *et al.* (2011) finds no evidence that the WTO membership positively affects trade among Russia's partners and concludes that in terms of overall trade increase the establishment of FTAs has a higher value compared to WTO accession.

A number of studies using the CGE model estimated positive gains for the CIS countries from accession to the WTO. Jensen *et al.* (2007) estimated a gain of 7.2% of the value of Russian consumption in the medium run from joining the WTO and in the long run the gain may be up to 24%. These gains would be sourced through the liberalisation of barriers against multinational service providers. In a similar study for Kazakhstan, Jensen *et al.* (2007) arrived at an estimated gain of 6.7% of the value of Kazakh consumption in the medium term which can go up to 17.5% in the long run. For Ukraine, Pavel *et al.* (2004) estimated a 3% gain of Ukrainian consumption and an increase in GDP by 1.9%.

Alongside with the estimated gains for the CIS countries from the WTO membership there are numerous "soft" reasons to become a member of the WTO. Drabek *et al.* (2004) pointed out several attractive dimensions for the transition countries to join the WTO: automatic benefit from future improvements of the market access, contribution to credibility of government policies, improvement

of institutions and domestic policies which are involved in the conduct of international trade, contribution to the predictability, security and transparency of market access, possibility to make use of the WTO's dispute settlement mechanism.

The importance of institutions in order to fully benefit from WTO accession was stressed in the quantitative assessment of the Kazakh accession to the WTO by Khatibi (2008). The regulatory and institutional reforms which are entailed in the WTO membership could lead in the long run to 68 % trade increase, in case institutions and regulatory quality in Kazakhstan reaches the level of EU-15.

As becomes clear from the covered literature, accession to the WTO can bring benefits for the CIS countries. Probably for the transition economies the "soft" benefits of membership are even more important than the hard but divergent estimates of the possible trade enhancement. Issues of corruption, inefficiency and lack of competition, which unfortunately characterise the most of CIS countries, will be definitely put on the agenda of negotiations to join the WTO and in this way will have to be tackled.

## **2.5 Customs Union between Belarus, Kazakhstan and Russia**

Creation of a customs union (CU) is a tighter form of the regional integration compared to the FTA as it provides the framework not only for free trade between the members but also sets a common external tariff (CET) to non-members.

The process of creation of a CU between Belarus, Kazakhstan and Russia (further CU BKR) started in 2007<sup>7</sup>. The legislative base and the negotiations on the common Customs Code were successfully concluded on the 1<sup>st</sup> of July 2010 when the CU officially became effective. With the very limited time span for analysis of the current CU and its effects for the participating members and non-members there is not much empirical literature on the subject.

According to Venables (2003) formation of a CU between high-income countries leads to the convergence of income per capita of the participating members, while in a CU between low-income countries an opposite process of divergence takes place. Thus the winners from the CU formation in the former case are the poorer countries with labour intensive industries, while in the latter case these are the richer countries with a structure of industries being closest to the world average.

Bearing in mind that Belarus, Kazakhstan and Russia belong to the upper-middle-income economies,<sup>8</sup> it remains to be seen which countries will be the winners in the current CU. A comparison of the comparative advantage between the members as well as with respect to the rest of the world is necessary to draw the conclusion on the benefits of the CU. De Haas *et al.* (2010) argue that the economic structures of Belarus and Russia are closest to the world average, therefore they are expected to benefit the most from the CU, while Kazakhstan would continue to be negatively affected by the lack of diversification and commodity driven economy.

In the analysis of the right sequencing of forming a CU and becoming a WTO member, Tumbarello (2005) found that Kazakhstan, Kyrgyzstan and Tajikistan would incur larger welfare losses in case

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<sup>7</sup> See figure 9.1 in the appendix for the illustration of the CU formation process.

<sup>8</sup> According to the classification of the World Bank.



those countries would form a CU with the EAEC members<sup>9</sup> prior to obtaining the WTO membership. Contrary to this, Russia and Belarus were found to benefit more from forming a CU prior to the WTO membership compared to the reversed sequence.

Although the CU BKR is already a reality and only Russia has secured the WTO membership, the study of Tumbarello pointed out to the existing antagonism between the CU members.

Tochitskaya (2010) analysed the economic impact of the CU BKR on Belarus. Although the study addressed a number of facts around the changes brought about by the CU membership, the complete picture of the impact of CU on Belarus remains to be made.

After formation of the CU, the level of tariff protection in Belarus was not changed noticeably: the MFN with the weighted average rose from 9.29% to 10.34%. A reduction of import from the non-CIS countries due to introduction of the CET may reach 8% of the 2008 import volume from the non-CIS countries. Additional revenues for the Belorussian budget, estimated to be 28.3% of the total customs charges in 2008, are expected to be generated from the customs clearance of Russian imports which are not subject to the distribution scheme of the customs duties of the whole CU between the members.

No positive impact on FDI attraction or WTO accession was found due to the participation in the CU. Further conclusions on the economic impact for Belarus will be highly dependent on the trade policy of the CU. If the CU works on the gradual reduction of the CET and decline of the NTB, participation in the CU may be beneficial for the Belorussian economy.

Jandosov *et al.* (2011) found a significant increase of the indicative level of tariff protection in Kazakhstan after joining the CU BKR. The trade-average tariff rose from 5.52% to 12.66%.

The implications of the BKR CU for the Kyrgyz and Tajik economies were outlined in a concise presentation by Vashakmadze *et al.* (2011). The authors expect that adoption of the CET by the BKR countries would lead to improved competitiveness for the CIS countries which had existing free trade agreements with the BKR. The impact on Kyrgyzstan and Tajikistan was analysed through the trade flows coming from those countries into Kazakhstan. Since Kazakhstan's MFN tariff rates increased due to the adoption of the CET and the preferential tariffs with the CIS stayed unchanged, suppliers from Kyrgyzstan and Tajikistan gained 7% in the weighted preferential margin over the non-CIS exporters. The exports of industrial products from Tajikistan to Kazakhstan are expected to increase by 6% of the total Tajik exports to Kazakhstan. On the whole, the adoption of the CET by the CU BKR is expected to boost the exports of Kyrgyzstan and Tajikistan in case the firms respond to the new competitive conditions and governments put the right incentives in place.

With Russia's growing pressure on Ukraine to join the CU BKR, it becomes interesting to analyse the benefits from becoming a CU member for this country. Movchan *et al.* (2011) analysed the welfare effects for the Ukrainian economy from concluding the FTA with the EU and becoming a member of the CU BKR by means of a CGE model. The findings show a total welfare increase by 1.3% in the short run and by 4.6% in the long run in case of establishment of a simple FTA with the EU. The impact on the Ukrainian economy from joining the BKR CU turned out to be negative: 0.5% decrease of the total welfare in the short run and 3.7% loss in the long run.

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<sup>9</sup> The Eurasian Economic Community (EAEC) members: Belarus, Kazakhstan, Kyrgyzstan, Russia and Tajikistan.

Further research which would cover a longer period is necessary to evaluate the impact of the CU BKR for its members, the remaining CIS countries and the rest of the world. Russia's membership of the WTO, which is almost a fact, will add very positive dynamics into further existence of the Customs Union between Belarus, Kazakhstan and Russia.

### 3. Main testable hypotheses

The three main trade policy options of the CIS countries are investigated by means of a number of hypotheses which are grouped under three separate subsections. Subsection 3.1 refers to hypotheses for the intra-CIS exports, exports from the CIS to the EU and vice versa. Subsection 3.2 states the hypotheses which cover the non-membership in the WTO of the CIS countries and its influence on the export flows. Subsection 3.3 is devoted to the hypotheses regarding the export flows between the members of the CU BKR and the export flows between the CU BKR and the remaining CIS countries.

The impact from each of the three main trade policy options is investigated in terms of export gains for the CIS countries. The ratio of total exports of goods to the GDP of each particular CIS country shows the importance of exports for the economy of each country. As table 3.1 shows not all of the CIS countries are export-oriented: Armenia, Uzbekistan and Turkmenistan are among the least exporting countries which earn less than 17% of their GDPs with exports. To the leading exporting CIS countries belong Azerbaijan and Belarus with a share of exports over 40% of their GDPs. It speaks for itself that the size of a country plays an important role for the export orientation – a smaller country is sooner inclined to export due to the small domestic market.

Table 3.1: The ratio of total exports of goods to GDP in %, 2010

Country	Exports/GDP ratio in %
Armenia	11.24
Azerbaijan	41.81
Belarus	46.08
Georgia	13.50
Kazakhstan	33.28
Kyrgyzstan	23.85
Moldova	26.54
Russia	25.25
Tadjikistan	21.18
Turkmenistan	15.97
Ukraine	37.29
Uzbekistan	14.94

Source: IMF and WBI data, own calculations

This section also makes reference to the “normal” level of exports. Following the terminology commonly used in the literature based on the gravity model, the normal level of the exports is referred to when it is predicted by the countries' size and bilateral distance. The above or below normal level of trade due to a certain form of preferential agreements is usually measured by the dummy variables. The positive coefficient of the dummy variable indicates an above normal level of intensity of the trade relations between the pair of countries and a negative coefficient indicates a below normal level correspondingly.

### 3.1 CIS countries and the EU

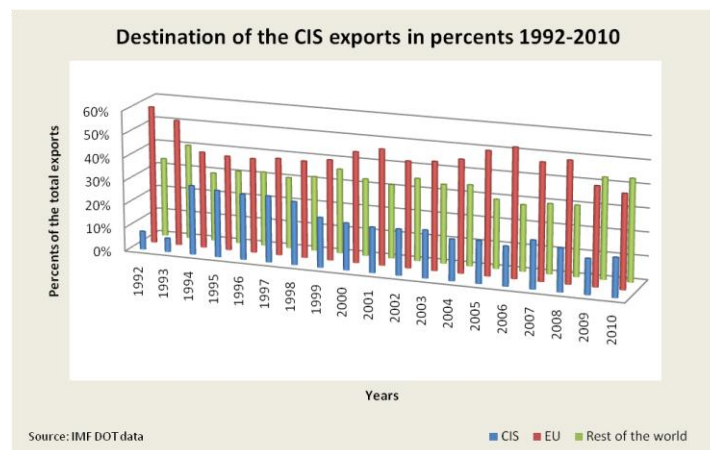
Before starting the evaluation of the prospects for the CIS countries to increase their exports to the EU it is worthwhile to investigate how the exports between the CIS countries evolved over time and whether the membership in the CIS generated extra exports between its members. The analysis of the export flows from the CIS to the EU and vice versa will follow in order to define the present trading situation between those partners. Next to this, the magnitude of the exports between the two EU countries will be estimated to serve as the upper boundary of the possible export increase.

#### 3.1.1 Intra-CIS exports

The breakdown of the CIS exports by the destination shows that the share of the intra-CIS exports has been declining from 30% in 1994 to 18% in 2008. In 2009 the share was negatively affected by the global financial crisis being only 15%, but in the 2010 there was a recovery back to 17%. Throughout the period 1992-2010 the share of exports going to the EU has been fluctuating around 47% with the peaks in 1992 of 57% and 2008 of 52%. The exports to the rest of the world have not shown many changes with an average 33% share of the total CIS exports.

The development of exports by destination is illustrated in figure 3.1. As can be seen from the figure, the EU has become a very important export partner which accounts for almost the half of the total CIS exports, while the intra-exports within the CIS show a declining trend over the period.

Figure 3.1



The declining intra-CIS trade suggests that the Commonwealth of Independent States gave form to a “civilised divorce” of the former Soviet republics rather than to an effective integrating entity in the region. Many political, historic and economic reasons contributed to the failure of the CIS to become a successful integration project.

A patchwork of numerous bilateral agreements characterises the trade relations within the CIS<sup>10</sup>. According to Grinsberg (2005), over 1,000 official agreements have been drawn up to regulate the trade within the CIS but only about 10% are effective. The simultaneous membership of a number of countries in other regional integrating initiatives (EEC, SES, Customs Union of Belarus, Kazakhstan and Russia) added an extra dimension to the already complicated structure of the bilateral relations between the countries.

<sup>10</sup> See table 9.1 in the appendix for the detailed overview of the RTA’s.

Next to this, the complex institutional infrastructure of the CIS with some bodies having little authority was not beneficial to the integration process. Libman (2008) states that in 2005 there were eight statutory bodies, sixty-seven sectoral bodies and nine affiliated public and private institutions within the CIS.

In contradiction to the formal integrating agreements some countries did introduce restrictions on trade, migration and investments. Vivid examples were trade wars between Russia and Ukraine over the gas and oil pipes, meat and sugar; between Russia and Moldova, Russia and Georgia over wine. Gas and oil prices served as a strategic tool of Russia to exert its influence in the region.

Pursuit of national interests, conflicting political agendas together with weak institutions of the participating countries deepened the gap between the formal integration and its implementation in real life. Unresolved conflicts between Armenia and Azerbaijan, Georgia and Russia form an additional undermining factor to regional integration.

Taking into consideration that the CIS is not a classical example of an integrating entity due to the lack of the binding multilateral agreements, it still has a number of positive trade facilitating features like recognition of each other's standards, non-restrictive rules of origin and bilateral free trade agreements.

With all the shortcomings of the CIS as an integrating project, the participating countries share the common communist history which even nowadays has huge implications for the economic development and trade of the CIS countries. Faced with the challenges of the transitional process the CIS countries found themselves producing lower quality goods which were primarily demanded by the participating countries making them their logical trade partners.

Shelburne *et al.* (2006) found that CIS countries over-rely on other CIS members as destination for their manufactures exports and under-rely on them for their own imports. The CIS members tend to sell their lower quality products to the member countries while for their imports the preference goes to the higher quality products from other countries.

The importance of the CIS market as export destination differs a great deal for the participating CIS members. In the course of time some countries managed to diversify their export markets and become more integrated into global world trade: in Armenia, Azerbaijan, Kazakhstan, Russia and Turkmenistan the exports to the CIS countries accounted for less than 25% of their total exports in 2010<sup>11</sup>. A less diversified structure of export destinations characterise Georgia, Moldova, Tajikistan, Ukraine and Uzbekistan which exported up to 50% of their total exports to the CIS members in the same year. Belorussia and Kyrgyzstan were highly dependent of the CIS for their export destinations with an export share above 50% in 2010.

It should be noted that even with an decreasing share of the intra-CIS exports, Russia remains an important export destination in the region. So in 1992 the CIS countries exported 55% of the total intra-CIS exports to Russia, in 2000 this share declined to 40% and in 2010 it dropped further to 30%.

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<sup>11</sup> Calculations are made using the IMF DOT data.

Notwithstanding the declining total share of the intra-CIS exports and inefficient efforts of regional integration under the CIS as well as mutual tensions between its members, the majority of the CIS countries continues to trade intensively with each other.

Considering the above mentioned factors, the exports between the CIS members are expected to be higher than they are supposed to be according to the gravity model which accounts for the bilateral distance between the countries, the GDPs of the countries, contiguity and common language.

Hypothesis #1 is:

$H_0$ : The level of exports between the CIS countries is in line with the normal level that is predicted by the gravity model (coefficient of the dummy CIS2 is not significant)

$H_1$ : The exports between the CIS countries are above the normal level predicted by the gravity model (coefficient of the dummy CIS2 is positive and significant)

**3.1.2 CIS exports to the EU**

In the early 90s there was not much development in the export flows from the CIS countries to the EU as these countries were in the middle of the transition process from central planned to market economies. The revival of the exports came around the year 2000, when the majority of the CIS countries made progress with implementation of market mechanisms in their economies.

Figure 3.2 shows the development of the CIS exports to the EU in million US dollars. The values for the Russian Federation are a scale larger than the rest of the CIS; therefore the secondary axis has been added for ease of reading.

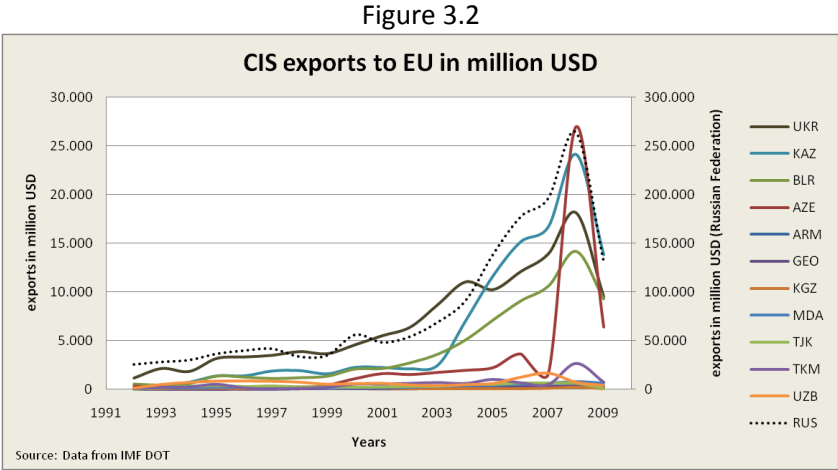


Figure 3.2 illustrates the quick growth of exports to the EU from Russia, Kazakhstan, Azerbaijan, Ukraine and Belarus starting around the year of 2000, while the remaining CIS countries did not show any significant increase in their exports to the EU. A short overview of the export composition of each CIS country to the EU in 2010 will give a better picture of the importance of these exports to the country in question and to the EU.

Russia is the absolute leader in exports to the EU among the CIS countries due to the abundant quantities of oil and gas that together form its major export good which accounted for 74.6% of its

total exports to the EU in 2010<sup>12</sup>. Russia is the largest producer of natural gas and second largest producer of crude oil in the world. Dependence of the European Union on imports of Russian energy is quite high, being 31% of the total EU imports in 2010.

Kazakhstan and Azerbaijan also belong to the oil exporting countries and their exports to the EU primarily consist of oil and gas which account for 89.6% of the total exports to the EU in 2010 for Kazakhstan and 99.2% for Azerbaijan. The importance of these two countries for the EU in terms of energy supply is quite small because the total share of the EU imports from Kazakhstan is only 3.7% and from Azerbaijan 3.1%.

Although Turkmenistan and Uzbekistan are large producers and exporters of natural gas in the CIS region, they have no direct access to the European market. Their access is subject to restrictions placed by Russia to its transit piping system. Still, the mineral fuels constituted 86% of the total exports from Turkmenistan to the EU in 2010, but the amount is negligible in terms of the EU's imports, being only 0.1% of the total imports of the EU. Uzbekistan has a more diversified export composition which is comprised of chemicals, mineral fuels, manufactured goods and crude material each representing about 23% of the Uzbek exports to the EU, but again these exports are like a drop in the sea of the EU imports – none of the above mentioned export categories surpass 0.1% of the total EU imports.

Ukraine's exports to the EU were dominated by iron and steel which accounted for 12.3% of the total EU imports in 2010. This export category accounted for 28% of the Ukrainian total exports to the EU. The next largest export category is mining products, with a share of 27% out of the total exports to the EU, accounted only for 0.7% of the EU's imports. Other categories like agricultural products, chemicals, machinery and transport equipment accounted for no more than the 1.6% out of the total EU imports.

Exports of Belarus to the EU were comprised of mineral fuels, chemicals, crude materials and agricultural products in 2010. Ranging from 31% to 10% of the total exports to the EU, these categories represented a very little share in the imports of the EU which did not surpass 0.5% for each.

The CIS countries which did not show a large increase of their exports to the EU in the analysed period did not have a much diversified exports composition. Next to this, their exports represented very little shares of the total EU's imports of 2010 ranging from 0.1% to 7.7%.

Based on the year 2010, Armenia's main export category was manufactured goods chiefly classified by materials which accounted for 78.6% of its exports to the EU. This export category accounted only for 0.1% of the EU's imports.

Moldova exported manufactured goods chiefly clarified by materials – 33.4 % of its total export to the EU, crude materials – 22%, animal and vegetable oil and fats – 4.5%. These export categories represented 2.4%, 3.9% and 7.7% of the total EU import correspondingly.

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<sup>12</sup> Data from the country profiles provided by the European Commission, available at <http://ec.europa.eu/trade/creating-opportunities/bilateral-relations/countries-and-regions/>.

Kyrgyzstan's chemicals accounted for 91.5% of its total exports to the EU which represented only 0.1% of the EU's total imports. Georgia exported mineral fuels being 43% and crude materials being 33% of its total exports to the EU. These two categories were only 0.1% and 0.3% of the EU's total imports.

Tajikistan's exports were represented by two categories: manufactured goods (materials) – being 61% of the total exports to the EU and crude materials – 21 %. These exports did not even account for 0.1% of the EU's total imports.

The above overview of the exports composition of the CIS countries to the EU shows that exports are dominated by primary products like fuels and mining products, manufactured goods chiefly classified by materials, crude materials, iron and steel. These commodities are highly sensitive to changes in the world prices and in most of the cases their demand depends on the economic conjuncture.

The lack of diversified exports will presumably contribute to smaller exports from the CIS countries to the EU when compared to other countries with more diversified high value added exports. Different factors may contribute to the prevalence of the primary products in the composition of the CIS exports to the EU. It is quite possible that CIS countries simply have nothing else to offer because their economies are not diversified enough. The smaller export flows from the CIS to the EU can also be attributed to the differences in stage of economical development and the corresponding level of sophistication of the manufacturing sector. The type of manufactured products which CIS countries can offer may be not competitive enough to find demand on the EU market. There also might be export impediments in force from the side of the EU for certain product categories which make any diversification of the exports from the CIS countries not feasible. These assumptions will be addressed one by one.

The first assumption can be checked by analysis of the exports from the CIS countries to the world. If their total exports are also dominated by primary products than indeed the CIS countries have little in stock to diversify their composition of exports to the EU.

Table 3.2 on the next page shows the percentage breakdown of the exports composition from the CIS countries to the EU (for 2008 and 2010) and to the world (for 2009) which also includes the CIS countries. The exports are divided into three categories: agricultural products, fuel and mining products which together represent primary products, and manufactured products. Agricultural products are comprised of food and raw materials; fuel and mining products are represented by fuels and non-ferrous metals, ores and other materials. The manufactured products are comprised of iron and steel, chemicals, machinery, transport equipment, semi-manufactures, clothes and consumer goods. The total of the export share does not always sum up to 100 due to the fact that some products do not fall under the above mentioned three product categories. Although the reference years differ for the exports to the EU and to the world due to the data availability, the table gives a good idea about the differences in the composition of exports.

When the composition of the CIS exports to the EU is offset against the total exports to the world, it becomes evident that such countries as Azerbaijan, Kazakhstan and Turkmenistan rely on fuel products for more than 80% of their exports to the world. Therefore the dominating share of the same product category in the exports to the EU is in line with what these countries have to offer for

export. Other CIS countries have a more diversified structure of their economies which is reflected by a more balanced composition of their total exports.

It should be pointed out that generally the share of the agricultural products exported by the CIS to the EU is disproportionately smaller than the share exported to the world. From the percentage breakdown one can see that the agricultural products are underrepresented in the exports to the EU for Armenia, Georgia, Moldova, Turkmenistan and Ukraine. Regarding the manufactured products, there is still some room for growth in the exports to the EU for Georgia, Kazakhstan and Russia when the total exports structure is taken as a reference base.

Table 3.2: The % breakdown of the CIS exports to the EU and to the world

Export composition	to the EU		to the world (incl. other CIS countries)	Export composition	to the EU		to the world (incl. other CIS countries)		
	2008	2010	2009		2008	2010	2009		
<b>ARM</b>	Agricultural products	5.5%	3.4%	19.0%	<b>MDA</b>	Agricultural products	19.1%	27.2%	47.7%
	Fuel and mining products	21.9%	33.9%	38.1%		Fuel and mining products	9.0%	6.0%	1.7%
	Manufacturing	70.9%	60.4%	36.2%		Manufacturing	71.6%	66.4%	50.6%
<b>AZE</b>	Agricultural products	0.1%	0.2%	2.6%	<b>RUS</b>	Agricultural products	1.8%	1.7%	6.9%
	Fuel and mining products	99.2%	99.3%	91.9%		Fuel and mining products	74.1%	79.5%	69.0%
	Manufacturing	0.5%	0.5%	2.4%		Manufacturing	9.1%	8.7%	21.1%
<b>BLR</b>	Agricultural products	4.8%	11.6%	12.2%	<b>TJK</b>	Agricultural products	11.6%	20.6%	14.4%
	Fuel and mining products	56.0%	34.0%	38.0%		Fuel and mining products	70.0%	54.7%	59.3%
	Manufacturing	38.4%	53.4%	47.6%		Manufacturing	18.2%	24.7%	11.3%
<b>GEO</b>	Agricultural products	7.4%	10.7%	35.7%	<b>TKM</b>	Agricultural products	0.2%	1.0%	10.2%
	Fuel and mining products	78.3%	76.2%	22.1%		Fuel and mining products	60.9%	87.0%	81.4%
	Manufacturing	13.4%	12.3%	42.2%		Manufacturing	1.2%	7.6%	6.9%
<b>KAZ</b>	Agricultural products	1.6%	1.1%	4.0%	<b>UKR</b>	Agricultural products	18.4%	16.4%	25.0%
	Fuel and mining products	91.4%	93.1%	81.2%		Fuel and mining products	26.6%	27.4%	12.3%
	Manufacturing	5.7%	3.4%	13.2%		Manufacturing	52.4%	52.1%	61.9%
<b>KGZ</b>	Agricultural products	26.5%	3.3%	12.8%	<b>UZB</b>	Agricultural products	8.2%	9.5%	n/a
	Fuel and mining products	55.0%	3.6%	4.1%		Fuel and mining products	46.4%	42.0%	n/a
	Manufacturing	14.8%	92.9%	15.2%		Manufacturing	43.5%	45.5%	n/a

Source: country profiles from the WTO statistics and the European Commission site.

Note: the total export share does not always sum up to a 100 as some products do not fall under the three product categories.

From the perspective of the exports composition, the CIS countries export relatively smaller shares of agricultural products and a few countries export also smaller shares of manufactured products to the EU than they do to the world.

The smaller shares of manufactured products in the exports to the EU can be explained by the Linder hypothesis which states that countries with similar standards of living will trade more with each other due to similar tastes of the consumers.

The EU belongs to the high-income countries while none of the CIS countries can be found in this category. According to the World Bank classification, Azerbaijan, Belarus, Kazakhstan and Russia have upper-middle-income economies; Armenia, Georgia, Moldova, Turkmenistan, Ukraine and Uzbekistan have lower-middle-income economies and Kyrgyzstan and Tajikistan belong to the low-income economies. Taking into consideration the considerable gap between the CIS countries with the low or lower-middle-income economies and the EU, the export flow from the CIS countries is expected to be less than the exports from the high-income economies.

The income-level of the economies is also indicative of the stage of the development the economies are in. Different stages of the economy development are in their turn characterised by a different level of sophistication of their manufacturing sector. It is only logical to presume that the economies with a higher level of technological sophistication will trade more with each other and will use the



lower income countries as a possible source for their semi-finished products or outsourcing for manufacture of the less sophisticated products.

The World Economic Forum published the global competitiveness report 2010-2011 which ranks the 139 countries in overall competitiveness. The economies of the analysed countries are also classified into three stages of development: factor driven, efficiency driven and innovation driven. The division between these stages is based on the level of the GDP per capita and on the percentage of the mineral exports out of the total exports for the country. The factor driven economies are those which export more than 70 percent of mineral products out of their total exports.

The economies of Kazakhstan, Moldova and Tajikistan are found to be in the first stage, the factor driven stage, of the development while Russia is in the second stage of efficiency driven economy. The remaining CIS countries find themselves in the transition phase from stage one to stage two<sup>13</sup>. The EU15 countries are all in stage three - they have innovation driven economies. The new member states of EU are in the transition phase to stage three with only Bulgaria and Romania being in the second efficiency driven stage.

The lower stages of economy development coincide with lower scores in innovation capabilities and technological readiness to adopt existing technologies. Table 3.3 shows the ranks in innovation and technological readiness and the overall competitiveness rank of the CIS countries and a number of EU countries.

Table 3.3

Country	Innovation	Technological readiness	Global competitiveness index			Definitions of indicators:
	2010-2011	2010-2011	2010-2011		2009-2010	
	Rank	Rank	Rank	Score	Rank	
ARM	114	108	98	3.76	94	<b>Innovation</b> evaluates investment in R&D, presence of high-quality scientific research institutions, collaboration between universities and industry, protection of intellectual property in a country.
AZE	66	70	57	4.29	57	
BLR	n/a	n/a	n/a	n/a	n/a	
GEO	121	98	93	3.86	90	
KAZ	102	82	72	4.12	71	
KGZ	137	119	121	3.49	116	
MDA	123	89	94	3.86	n/a	
RUS	80	69	63	4.24	63	
TJK	118	120	116	3.53	112	
TKM	n/a	n/a	n/a	n/a	n/a	
UKR	88	83	89	3.9	87	<b>Technological readiness</b> measures the agility with which an economy adopts the existing technology in order to enhance the productivity of its industries. The usage of ICT gets a special emphasis.
UZB	n/a	n/a	n/a	n/a	n/a	
						<b>Global competitiveness index</b> based on 12 pillars which determine the level of productivity of a country. The 12 pillars are: institutions, infrastructure, macroeconomics environment, health and primary education, higher education and training, goods market efficiency, labour market efficiency, financial market, development, technological readiness, market size, business sophistication, innovation.
SWE	3	1	3	5.56	3	
GER	5	10	5	5.35	5	
FIN	6	15	7	5.37	7	
NL	8	3	8	5.33	8	

Source: The global competitiveness report 2010-2011, World Economic Forum

The very low ranks for innovation and technological readiness of the most of the CIS countries may indicate the incapability to offer high-quality manufactured products that will find the customers on the EU market. In a study of the manufacturing sector of the CIS countries Shelburne *et al.* (2006) found that the CIS products are of lower quality compared to the world and that this is especially true for the manufactures. This is quite plausible as the manufacturing industry of the CIS countries went through a period of stagnation in 1992-1999 which put the sector into a disadvantaged position

<sup>13</sup> Belarus, Turkmenistan and Uzbekistan are not covered in the Global Competitiveness Report 2010-2011.

in terms of technology development, innovation capacities and R&D resources. Apparently it will take still quite some time for the manufacturing sector to catch up with the current world standards.

Although the industrial sector of CIS countries grows again<sup>14</sup>, a number of countries did not yet achieve the 1992 level of added value in the industry even in the peak year of 2008. Among them are: Kyrgyzstan with the industry added value in 2008 being only 62% of 1992's, Moldova – 50% and Ukraine – 75% correspondingly.

Table 3.3 also shows that the CIS countries are far behind the European countries in global competitiveness. Among the 139 covered countries of the world, the CIS countries find themselves in the second lowest quarter, while the strongest European countries belong to the top ten. Only Azerbaijan is ranked in the second highest quarter while Kyrgyzstan and Tajikistan belong to the lowest quarter.

It is probable that large differences in income-level, competitiveness and development stages of the economies between the CIS countries and the EU negatively affect the export flows from the CIS countries to the EU. However, the policies applied by the EU to restrict certain exports from the CIS countries may play just as an important role.

The trade policies of the European Union have a complex nature. Through the years of its existence the EU applied a whole range of different measures to protect its sensitive products. The agricultural sector has always been under heavy protection with a broad variety of measures in force: from domestic support or export subsidies to market access restrictions.

Although export subsidies have been reduced and domestic support has been unlinked from production under the Single Payment Scheme in 2008, the agricultural sector still enjoys the highest level of protection with an average applied tariff of 15.2% in 2011<sup>15</sup>. Compared to the average tariff on agricultural products in 1995 of 25%, this is quite a significant reduction, but there are still numerous non-tariff barriers in place.

Generally, industrial products were subject to considerably smaller tariffs – in 1995 the average MFN tariff on industrial products was 6%, which was further reduced to 4.1% in 2011. The liberalisation of industrial products was achieved by 2000 when the average tariff was reduced to 4.2%.

Apart from the progress in the liberalisation of industrial products there were and still are some products categories which belong to the sensitive ones and therefore subject to above-average tariffs and other protective measures. Manufacturing of products with relatively labour intensive production like textiles, clothing, footwear, chemicals, iron and steel could not compete with the lower wage countries and therefore was classified as sensitive by the EU. The intensity of the protection as well as the list of these sensitive product categories has been changing through the years.

The overview of the average MFN tariffs applied by the EU for the selected categories of products during the last few years is shown in table 3.4. There are a number of things worth mentioning here.

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<sup>14</sup> See figure 9.2 in the appendix for development of the industrial output in the CIS, in period 1992-2009.

<sup>15</sup> WTO Trade Policy Review: European Union: July 2011, November 1997.

Firstly, the applied tariffs on sensitive products in the shown period are not considerably higher than the average tariff on the manufacturing goods (with the exception of textiles which are kept with 8% tariff).

Secondly, the escalation of the tariffs from semi-processed to fully-processed products is indicative of the higher protection of the final product manufacturing in the EU. Furthermore, in 2011 the applied tariff on raw materials was 6.8% which is quite substantial when compared to only 3.7% tariff in the same category imposed by the USA in 2009<sup>16</sup>. This suggests a pure revenue raising activity.

Thirdly, the number of lines which refer to a number of products subject to a certain tariff has been generally falling through the years, which is also a sign of gradual liberalisation.

Finally, the range of applied tariffs can vary quite a lot within a category, which means that to some products prohibitive tariffs are still applied.

Table 3.4

	2011			2008		2006		2004	
	No. of lines	Tariff (%)	Range tariff (%)	No. of lines	Tariff (%)	No. of lines	Tariff (%)	No. of lines	Tariff (%)
<b>Agriculture</b>	1,998	<b>15.2</b>	0-200.6	1,858	<b>17.9</b>	1,957	<b>18.6</b>	1,962	<b>16.5</b>
<b>Non-agriculture (excl. petroleum)</b>	7,255	<b>4.1</b>	0-26	7,658	<b>4.1</b>	7,743	<b>4.0</b>	8,042	<b>4.1</b>
Mineral products, precious stones and metals	477	2.5	0-12	514	2.5	513	2.4	518	2.4
Metals	1,002	1.7	0-10	1,022	1.7	1,024	1.8	1,043	1.8
Chemicals and photographic supplies	1,247	4.4	0-17.3	1,396	4.4	1,389	4.4	1,397	4.4
Leather, rubber, footwear and travel goods	275	4.9	0-17	285	4.8	283	4.8	291	4.7
Textiles and clothing	1,207	8.0	0-12	1,234	8.0	1,269	8.0	1,329	8.0
Transport equipment	257	5.0	0-22	269	4.8	262	4.8	273	4.7
<b>By stage of processing</b>									
Raw materials	1,142	6.8	0-93	1,168	8.1	1,197	8.9	1,219	8.4
Semi-processed products	2,764	4.8	0-124.4	2,897	5.0	2,911	5.0	2,935	4.8
Fully-processed products	5,388	7.1	0-200.6	5,492	7.3	5,633	7.5	5,891	7.0

Tariff (%) is a simple average of most favoured nation tariff

Source: WTO: EU Trade Policy Reviews of 2011, 2009, 2007 and 2005

Next to the visible reduction of the applied MFN tariffs by the EU there are numerous non-tariff barriers (technical, sanitary and phytosanitary requirements) in force which regulate the imports of products. Additional protection measures against dumped imports have been widely used by the EU.

With respect to the CIS countries, which have their comparative advantage in relatively labour intensive sectors, the protective measures of the EU mostly affect their core export categories: agricultural, chemical and metallurgical products. Aslund *et al.* (2003) suggests that the number of CIS countries have not been able to fully utilise their comparative advantages in trade with the EU due to the EU's trade policies towards them. It holds for Ukraine in textiles, for Ukraine and Moldova in agricultural products, for Russia and Ukraine in chemicals and for Russia, Ukraine and Kazakhstan in steel products.

In 2000 a number of anti-dumping measures were in force on the EU imports of iron and steel, chemicals and electronics<sup>17</sup>. The anti-dumping measures against the CIS countries have been more severe compared to measures undertaken against other countries. This had to do with the non-market economy (NME) status of most of the CIS countries.

In the 1998 all of the CIS countries were treated by the EU as NME except for Russia, for which the market economy treatment depended on the existence of the prevailing market economy conditions

<sup>16</sup> WTO Trade Policy Review: United States of America, October 2010.

<sup>17</sup> WTO Trade Policy Review: European Union, July 2000.

for the firms manufacturing the products in question<sup>18</sup>. Detlof *et al.* (2007) found that the anti-dumping duties against the companies with market economy treatment was on average 28 percentage points less than for companies without such a treatment.

Official recognition of the market economy status came for Russia in 2002 and for Ukraine in 2005. By the year of 2009 there were still five CIS countries with the NME status: Azerbaijan, Belarus, Tajikistan, Turkmenistan and Uzbekistan<sup>19</sup>. The remaining CIS countries, which have not yet been granted the market economy status officially, but which are not listed under the non-market economy status either – Armenia, Georgia, Kazakhstan, Kyrgyzstan and Moldova – must be in the process of obtaining this status.

Alongside with the MFN tariffs the EU uses three types of generalised system of preferences (GSP) which provide reduced tariffs schemes on certain products for a number of developing countries. The overall importance of the GSP schemes is quite limited. In 2008 each type of the schemes accounted for about 5 percent of the total EU imports<sup>20</sup>, but it constituted almost one third of the whole imports of products like animal fats, footwear, live animals, etc.

Most of the CIS countries were offered the standard GSP as a part of the Partnership Cooperation Agreements with the EU in 1999. In October 2010 Armenia and Azerbaijan got the extended GSP+, which offers further tariff reductions to countries which implement the international standards for human rights, good governance and sustainable development. Moldova got the unilateral preferential tariff on industrial and some agricultural products in 2011 for the period of two years. The differences in applied tariff rates can be quite substantive: GSP+ offers greater reductions compared to the standard GSP. The applied tariffs in 2011 under different schemes are shown in the table 3.5.

Table 3.5

Applied preferential tariffs (%), 2011

	All products (HS 01-97)	Agricultural products	Non-agricultural products
MFN	4.83	10.10	3.63
Standard GSP	2.62	7.15	1.58
GSP+	0.52	2.48	0.07
Moldova	0.09	0.44	0.00

Source: WTO: EU Trade Policy Review of 2011, p. 147

Summing up, the EU trade policies towards the CIS countries might have exerted some negative effect on the export flows from the CIS countries. The match of the sensitive product categories for the EU with the product categories which form the comparative advantage for the CIS could not have been beneficial for the CIS countries. Alongside with the positive developments of tariff reductions on agricultural products and by a large scale liberalised manufacturing sector, the EU has been making use of anti-dumping and non-tariff measures to restrict the access to sensitive sectors of its single market. The timing of granting the market economy status to the selected CIS countries could have been arbitrary as even the WTO does not offer guidance in the requirements to market economy status. Due to changing composition of the GSP schemes through the years a more detailed

<sup>18</sup> See Council Regulation (EC) No. 905/98.

<sup>19</sup> See Council regulation (EC) No. 1225/2009.

<sup>20</sup> WTO Trade Policy Review: European Union 2011, Chapter 2, p. 21.

analysis is necessary in order to be able to make a conclusion whether these schemes have led to export facilitation for the CIS countries.

Notwithstanding the growing exports from the CIS countries to the EU, their composition has been dominated by the primary products. Differences in income level, stage of development of the economy and lower competitiveness of the CIS could have led to the lower export flows from the CIS to the EU. Trade policies applied by the EU to protect a number of sensitive products where the CIS countries happened to have their comparative advantage could have exerted a negative effect on the export flows as well.

The above mentioned factors lead to the Hypothesis #2:

$H_0$ : *The level of exports from the CIS countries to the EU is in line with the normal level that is predicted by the gravity model (the coefficient of the dummy CISEU is not significant)*

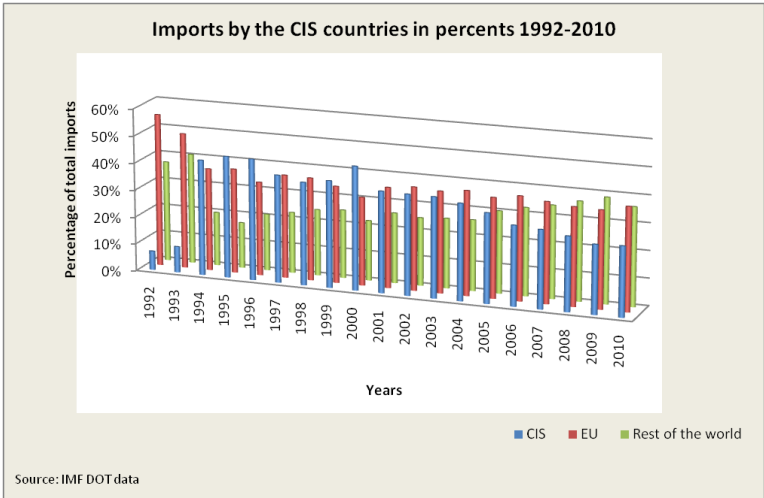
$H_1$ : *The exports coming from the CIS countries to the EU are below the normal level predicted by the gravity model (the coefficient of the dummy CISEU is negative and significant)*

**3.1.3 EU exports to CIS countries**

With the outlined hypothesis #2 it becomes interesting to investigate whether the export flows coming from EU to the CIS countries are in line with the gravity model predictions. If the EU exports are below the normal level predicted by the gravity model this may be indicative, among others, of the trade diversion effect of the EU in favour of their members or the immaturity of the institutions and unstable business climate in the CIS may play an important role in the non-export decision of the EU companies.

A quick analysis of the development of the EU export flows to the CIS countries reveals that the share of the total EU exports to the CIS countries stayed in the range of 2-3% of the total EU exports during the period 1992-2010<sup>21</sup>. The weight of this tiny EU’s export share is quite large for the CIS countries. In terms of imports to the CIS, the EU accounted for 38% of the total imports while the intra-CIS imports accounted for a smaller 33% in the period 1992-2010. The breakdown of imports by the CIS countries by source in the above mentioned period is depicted in figure 3.3.

Figure 3.3



<sup>21</sup> See figure 9.3 in the appendix.

It is worth pointing out that in the last decade the share of the CIS imports from the EU has been stable at an average of 37%. From the year 2000 onwards the imports from the rest of the world have been increasing from 22% to 36% in 2010 while the intra-CIS imports have been declining from 45% to 26% in 2010.

The increase of the imports from the rest of the world can be attributed to the high growth rate of the GDP with an average of 8.5% for the CIS countries in the period 2000-2008. Economic growth boosted modernisation of existing industries, growing standards of living made a broader range of goods more affordable for consumers in the CIS countries.

Although the EU exports represented a stable 38% share in the import of the CIS, it is remarkable that economic growth of the CIS in 2000-2008 was not accompanied by growth of exports from the EU. The period 2000-2008 in the EU history embraces the last two enlargement rounds: in 2004 with ten countries and in 2007 with two countries. It might be possible that the old and the new EU members were in the middle of the integration process and could not expand their exports further eastwards to meet the growing demand from the CIS countries.

As can be seen from table 3.6, the exports from the old EU members to the new members and the CIS countries represent small shares out of the total EU 15 exports. Still in a 17 year span these shares increased considerably: by 110% and 159% for the EU 2004 and the EU 2007 respectively; and by 83% for the CIS.

Table 3.6: Export share in % of the total exports with breakdown by destination

Export share in % of total exports									Annual % growth in 2010 compared to		
From	Destination	1994	1998	1999	2004	2006	2009	2010	1994	1999	2004
EU 15	EU 2004	3.19	4.44	4.27	5.10	5.97	6.30	6.70	110.26	57.03	31.39
	EU 2007	0.36	0.43	0.43	0.74	0.90	0.91	0.92	159.35	113.30	24.89
	CIS	1.39	1.47	1.01	1.99	2.56	2.49	2.54	82.51	152.32	27.79
EU 2004	EU 15	48.44	57.82	61.54	58.18	53.83	53.07	52.86	9.14	-14.10	-9.13
	EU 2007	0.80	1.08	0.97	1.52	1.92	2.21	2.22	178.66	127.73	46.25
	CIS	8.08	7.00	3.95	4.41	5.94	5.84	6.22	-23.07	57.65	41.13
EU 2007	EU 15	45.55	58.99	60.60	60.64	55.27	57.38	55.22	21.22	-8.88	-8.94
	EU 2004	4.72	5.35	5.34	6.43	8.43	9.02	9.87	109.14	85.05	53.45
	CIS	8.49	6.99	4.79	2.60	4.41	5.16	5.63	-33.69	17.43	116.27

Source: IMF DOT data, own calculations

Notes: EU 15 stands for the 15 old EU members

EU 2004 stands for the 10 new EU members which joined the EU in 2004

EU 2007 denotes the 2 new EU members which joined in 2007 (Bulgaria and Romania)

Difference in the speed of exports' growth can be attributed to the integration process within the EU. The conclusion of the Europe Association Agreements<sup>22</sup> with the accession countries of 2004 and 2007 enlargement rounds took place in 1994, 1995 and 1998 years. The pre-accession period was marked by the highest increase of exports from the old EU to the future members. The imports of CIS

<sup>22</sup> The ultimate goal of Europe Association Agreement (EAA) was establishment of the FTA between the old EU members and accession countries. The EAA was concluded in 1994 with Hungary, Poland; in 1995 with Bulgaria, Czech Republic, Romania and Slovakia; in 1998 with Estonia, Latvia, Lithuania and Slovenia.

countries from the old EU members showed a positive growth with a setback in 1999, the year just after the Rouble crisis.

At the same time the integration process of the new member states translated into a decrease of exports to the CIS over the period 1994-2010. This development should be put in the perspective of the economic sizes of the new EU members. The EU 2004 countries represented only 6.41% of the combined GDP of the EU 27 in 2010, while the EU 2007 represented even less – 1.29%. Thus decline of their exports was more than compensated by growth of exports from the old EU members. Furthermore, when the shorter period after the Rouble crisis of 1998 is considered, all the EU member states showed an increase of their exports to the CIS.

The positive growth of the EU exports to the CIS countries is believed to be beneficial to the economic growth of the CIS countries. De Souza *et al.* (2004) assume that EU contributes positively to the growth of the CIS countries through the export of capital goods which generally incorporate technology transfer.

The composition of the EU's exports to the CIS countries reveals that *manufactures* accounted for 87% of exports in 2006 and 2008; this share decreased a bit to 85.5% in 2010<sup>23</sup>. The largest export category of the manufactures through the years had been machinery and transport equipment which comprised 46.9% of the EU exports to CIS in 2006, 49.5% in 2008 and 43.6% in 2010. The comparison of these figures to the EU exports to the world in 2010 gives a similar picture: the manufactures were leading export goods with 81.4% of total exports and they were represented by the largest category of machinery and transport equipment which accounted for 42.5% of total exports.

Although the exports from the EU to the CIS countries showed positive growth over the analysed period and the composition of the exports is similar to that of the world, it is still possible that the EU exported less to the CIS countries than could have been expected after correction for distance and GDP differences.

Having a strong reputation on the world market of high quality goods, the EU is in the privileged position to choose the markets it wants to be active in. Next to this, the EU is fully integrated in the global trade and has a large domestic market. With plenty opportunities for export destinations such issues as political stability, the rule of law and respect of property rights gain more weight for the decision to export to certain countries. Therefore the impact of well developed institutions and good governance practices on the economic relations between the countries should not be underestimated.

Comparison of the governance quality in the CIS countries to the governance quality of the new members of the EU, taken separately on basis of the year of accession, and the old 15 EU members reveals huge differences. Table 3.7 represents the governance indicators for each group of countries which are calculated as simple average scores for the year 2010. The scores vary from -2.5, which is the worst estimate, to 2.5, which represents the best estimate.

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<sup>23</sup> The European Commission site, Statistics on the CIS countries, available at [http://trade.ec.europa.eu/doclib/docs/2006/september/tradoc\\_113479.pdf](http://trade.ec.europa.eu/doclib/docs/2006/september/tradoc_113479.pdf).

Table 3.7: Simple average scores of governance indicators for 2010 per country group

	Control of Corruption	Rule of Law	Regulatory Quality	Voice and Accountability	Government Effectiveness	Political Stability Absence of Violence/Terrorism
EU 15	1.48	1.50	1.44	1.33	1.48	0.77
EU 2004	0.56	0.94	1.13	0.99	0.96	0.78
EU 2007	-0.17	-0.02	0.63	0.47	-0.07	0.32
CIS	-0.96	-0.87	-0.59	-1.04	-0.63	-0.36

Source: World Bank database, the World Governance Indicators

Notes:

EU 15 stands for the 15 old EU members

EU 2004 stands for the 10 new EU members which joined the EU in 2004

EU 2007 denotes the 2 new EU members which joined in 2007 (Bulgaria and Romania)

The scores of Georgia and Tajikistan were incorporated under the CIS simple average, though these countries were no longer CIS members in 2010

It is obvious that the CIS countries are lagging far behind the average level of the EU standards. The huge gap in governance quality can also be seen as a trade barrier between the countries. As it was pointed out in the World Bank Report of 2002, well developed institutions contribute to reduction of transaction costs between market participants, ensure efficiency of the markets and regulate the distribution of assets, incomes and costs. The low quality of institutions and governance practices is therefore assumed to have just the opposite effects which are not to the advantage of the CIS countries. All together the underdeveloped institutions and bad governance contribute to a less attractive image of the country to do business with.

Summing up, the development of exports flows from the EU to the CIS countries in the analysed period of 17 years grew at a lower speed compared to the new EU members of 2004 and 2007 rounds of enlargement which can be attributed to the integration process within the EU. Composition of the exports does not substantially differ from the composition of the EU exports to the world. The poor quality of governance and institutions in the CIS countries could have formed a substantial trade barrier for extending the export activities for the EU companies.

Hypothesis #3 is:

$H_0$ : *The level of exports from the EU to the CIS countries is in line with the normal level predicted by the gravity model (coefficient of the dummy EUCIS is not significant)*

$H_1$ : *The level of exports from the EU to the CIS countries is below the normal level predicted by the gravity model (coefficient of the dummy EUCIS is negative and significant)*

### 3.2 CIS countries and the WTO

Previous studies addressed the question of the WTO membership and its potential benefits for separate CIS countries<sup>24</sup>. The membership in the WTO has been seen as a symbol for integration in the world economy. In the past 19 years the CIS countries re-directed their trade patterns and became more active on the global trade arena. Some of the CIS members have obtained the WTO membership, others are still outsiders<sup>25</sup>.

<sup>24</sup> See literature overview in section 2.4.

<sup>25</sup> See table 9.2 in the appendix for an overview of the CIS countries with WTO membership.



With the division of the CIS countries into members and non-members in the WTO it becomes interesting to investigate the effect of the WTO membership alongside with the effects of CIS countries being non-members of the WTO on the export flows. Basically the interest is focused on the CIS countries which are non-members of the WTO in the way how this “CISnonWTO” status influences the export flows from these countries to the WTO members and vice versa.

By July 2008 the World Trade Organisation counted 153 country participants. The largest outsider – Russian Federation – signed the terms of entry to the WTO on the 16th of December 2011 and is expected to become a full member after the ratification of the deal by its parliament. With Russia becoming a full member in about half a year time, the WTO becomes truly global.

Presently, even without Russia being an official member yet, the WTO has a huge number of participant countries worldwide. All these countries committed to respect and enforce the fundamental principles of the WTO: non-discrimination, more open and competitive trade, predictability and transparency, protection of the environment and more benefits for the less developed countries. The WTO offers mechanisms for dispute resolution, serves as a forum for negotiations of trade agreements between governments and runs the system of trade rules. All together the WTO creates a base for the multilateral trading system.

The CIS non-membership in the WTO can imply that a country is not yet prepared to implement the fundamental principles of the organisation. Obtaining the membership in the WTO takes a lot of effort and commitments from an applicant country in the fields of domestic support policies, liberalisation of the market access and export competition. A broad variety of issues should be given form to like commitments on market access for goods and services, on reduction of industrial and agricultural subsidies, on reduction of sanitary and technical barriers to trade, on protection of intellectual property, etc.

For a CIS applicant country, with less competitive industrial sectors, a careful negotiation on the scheme and scale of protective measures reductions is required. Commitments on reduction of protectionism and state support can have negative effects for the domestic producers. All in all the accession process involves a long way of domestic reforms and numerous adjustments in the legislative base.

### **3.2.1 Exports of CIS countries non-WTO members to WTO members**

The exports from the CIS countries non-WTO members to the WTO members are assumed to be below the export flows level predicted by the gravity model due to a number of reasons.

First of all, the CIS countries (both WTO members and non-members) are less integrated into the global trade. They trade more intensively with a limited number of countries. In 2010 the export flows from the CIS countries to the top five trade partners, among which are CIS countries as well, accounted for 63% of their total exports, while in a case of the well-integrated EU this figure was only 45%<sup>26</sup>. The CIS countries may need some time for the development of a broader set of export partners worldwide.

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<sup>26</sup> Source: The European Commission, Statistics per Country, Country Profiles of the CIS (2011), available at [http://trade.ec.europa.eu/doclib/docs/2006/september/tradoc\\_113479.pdf](http://trade.ec.europa.eu/doclib/docs/2006/september/tradoc_113479.pdf).

The arguments regarding the low quality of products, lack of competitiveness and diversification of the export's composition are less strong when exports for the CIS countries to the WTO members is considered than in case of their exports to the EU. Three quarters of the WTO members are developing countries, which means that they are more or less in the same stage of economy development as transitional economies of the CIS. This should be a positive sign to development of bilateral trade relations bearing in mind the Linder hypothesis. So far, the range of the CIS's export partners stayed limited to the other CIS countries, the EU and a number of other countries. Thus the lower integration into the global trade should have had a negative influence on the volume of the analysed export flows from the CIS non-WTO members to the WTO members.

Secondly, the CIS non-WTO countries could not benefit from the MFN tariffs applicable to the WTO members. They were/are more easily subject to antidumping duties or quantitative restrictions from the side of the WTO members. Lissovlik *et al.* (2004) referred to 120 restrictions imposed by WTO members on exports from Russia by 2001. Although this is only one example of the restrictive behaviour in the past, the non-membership might have impeded the equal treatment in the antidumping investigations and permissible retaliation under the WTO rules which in its turn could have exerted negative influence on the exports of the CIS countries.

Another important factor for consideration is that the majority out of seven CIS countries<sup>27</sup> which currently do not have the WTO membership, are oil rich (Azerbaijan, Kazakhstan and Russia) or gas rich (Turkmenistan and Uzbekistan) countries. The assumption is that these countries have a strong position in the negotiations on the exports of fossil fuels disrespectfully whether their counterpart is a WTO member or not.

The world's growing demand for oil, which is only temporarily hampered in times of global crisis, should have attributed to the normal level of exports to the WTO members from the CIS oil rich countries which are not WTO members. For Turkmenistan and Uzbekistan, which are limited in their gas exports to Europe by lack of own pipeline infrastructure, the exports to the WTO members might have been negatively influenced due to the lower integration into the global trade.

Combining the outlined pros and cons which influence the level of exports coming from the CIS countries with the non-WTO membership to the WTO members, Hypothesis #4 is stated as follows:

*H<sub>0</sub>: The level of exports from the CIS countries non-WTO members to the WTO members is in line with the normal level predicted by the gravity model (coefficient of the dummy CISnonWTO\_WTO is not significant)*

*H<sub>1</sub>: The level of exports from the CIS countries non-WTO members to the WTO members is below the normal level predicted by the gravity model (coefficient of the dummy CISnonWTO\_WTO is negative and significant)*

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<sup>27</sup> These countries are: Azerbaijan, Belarus, Kazakhstan, Russia, Tajikistan, Turkmenistan and Uzbekistan.

### **3.2.2 Exports of WTO members to CIS countries non-WTO members**

Considering the export flows from the WTO members to the CIS countries which are not WTO members, two opposing arguments arise.

On the one hand, the global character of the WTO is expected to contribute to the development of trade between the WTO members as they can rely on the system of trade rules and dispute settlement facilitated by the WTO. With so many countries worldwide being a WTO member, the non-membership almost places question marks on the reliability of a trade partner outside the WTO. Next to this, the CIS countries face similar challenges in the transition to market economies which make them, roughly speaking, less attractive trade partners. Therefore the WTO membership can serve as a sign of credibility to the outside world which together with the fundamental principles of non-discrimination will positively contribute to the exports to and from the CIS countries which obtained the membership. In this way the non-membership can have double implication: doubts in credibility of a non-member by the WTO members and the disadvantaged position compared to the other CIS countries which are members of the WTO. These two arguments can lead to fewer exports from the WTO members to the CIS countries non-WTO members.

On the other hand the WTO members can still choose to export to the CIS non-WTO countries due to their large potential markets for their products (countries like Russia, Kazakhstan and Turkmenistan). The absence of the WTO membership of a particular CIS country can be associated with a higher risk of doing business which in its turn can be translated in a higher price of exported goods. Thus the non-membership of the WTO of the CIS country might be seen as a yellow light, but it is definitely no no-go red.

Hypothesis #5 regarding the exports from the WTO members to the CIS countries without WTO membership is as follows:

*H<sub>0</sub>: The level of exports from the WTO members to the CIS countries non-WTO members is in line with the normal level predicted by the gravity model (coefficient of the dummy WTO\_CISnonWTO is not significant)*

*H<sub>1</sub>: The level of exports from the WTO members to the CIS countries non-WTO members is below the normal level predicted by the gravity model (coefficient of the dummy WTO\_CISnonWTO is negative and significant)*

### **3.3 CIS countries and the Customs Union of Belarus, Kazakhstan and Russia**

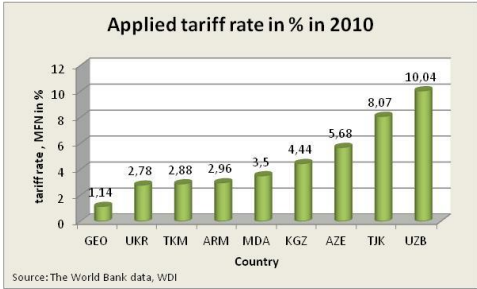
The creation of the customs union between Belarus, Kazakhstan and Russia is one of the serious initiatives of integration in the post-Soviet area. The participants emphasise that this is an open integration project which welcomes any willing CIS country. Recently Ukraine has been actively encouraged by Russian politicians to consider this option.

Apart from the question of benefits from the CU creation to its current members, a number of questions arise for the CIS countries which may consider joining the CU. According to the database of

the bilateral free trade agreements of the WTO, the majority of the CIS countries does have an FTA with the participating countries of the CU. The question is to which extend those FTAs are still in force since the most of them date back to the early 90s and a lot has been changed in a twenty year period in political and economic fields.

All of the CIS countries have a lower applied tariff rate for the incoming imports compared to the 10.6% tariff applied in the CU in 2010. Figure 3.4 shows the different tariff rates in the CIS countries in 2010.

Figure 3.4: The MFN tariff rate for all products in %, in 2010



Joining the CU BKR would mean the necessity to accept the higher common external tariff. This may have negative consequences for the CIS countries which trade a lot with the EU: the high quality capital goods would be intentionally held back with the possibly negative impact on the modernisation of the CIS industries. Next to this, some of the CIS countries cannot accept the higher external tariff due to bound tariff commitments they have as a member of WTO (Armenia, Georgia, Kyrgyzstan, Moldova and Ukraine).

However, the problem of a high external tariff is a temporary one. As an almost member of the WTO, Russia has a commitment to lower its applied tariff for the majority of products to 7.8% by the time it becomes a full-fledged member, which automatically means a commitment to CU external tariff reduction. The tariff 7.8% is still quite high, further reduction is expected to follow in the near future.

Membership of the CU will bring the benefits of free access to the internal market of the CU for the joining CIS country, as far as this access has not yet been secured by the bilateral FTA's from the 90s. With the higher common external tariff applied in the CU, the participant countries buy time for the domestic industries to modernise. Apart from economic benefits which will be different in case of each CIS country, there is a political side of this membership. With Russia being a dominating partner in the CU, one can wonder if CIS countries, which are currently out of the CU, are willing to come back under the sphere of Russian influence.

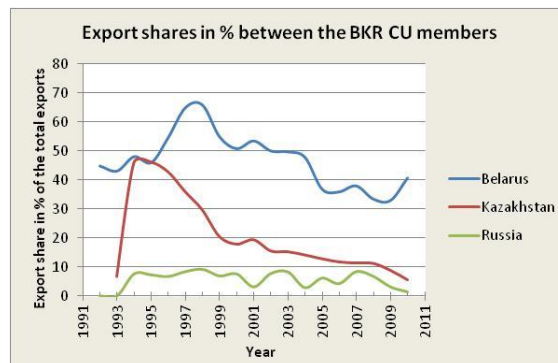
**3.3.1 Exports between the BKR CU members**

Although the CU between Belarus, Russia and Kazakhstan is a very recent phenomenon, it is interesting to investigate whether the CU has a positive effect on the export flows between the participating countries.

The development of the export flows between the CU members over the whole period of 1992-2008 fits the general declining trend for the intra-CIS exports. As can be seen from figure 3.5, the export share of Belarus to Kazakhstan and Russia was declining from 65% in 1998 to 33% in 2008.

Kazakhstan experienced a decline of its exports to Belarus and Russia from 45% in 1994 to 11% in 2008. Russia's exports to the two countries fluctuated around 6% in the last two decades.

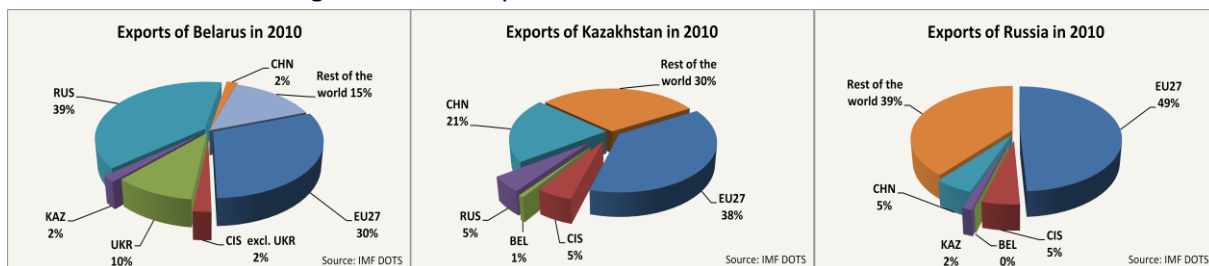
Figure 3.5: Export shares in % of the total exports between the members of CU BKR



The effect of the financial crisis in 2008 must probably be mitigated or even be out shadowed by the positive effect of the CU formation which became a reality by July 2010. The export flows of Russia and Kazakhstan to the future CU partner countries were definitely affected by the financial crisis. The export flows of Kazakhstan decreased by 50%: in 2007 the share accounted for 11% of total Kazakh's exports and in 2010 it dropped to 5.7%. More dramatic was the decrease of Russian exports to the CU partners: an 84% drop took place with an export share of 8% in 2007 and only 2% in 2010. Belarus, on the contrary, showed a u-shaped development of its exports to the partner countries: from 38% in 2007 down to 33% through 2008 and 2009 and up to 41% of the total exports in 2010.

Figure 3.6 illustrates the importance of each CU member to each other in terms of export shares based on the total export value and destinations in 2010.

Figure 3.6: The export structure of CU members in 2010



For Belarus, Russia was the major export partner with the 39% share of total exports, while export to Kazakhstan took up only for 2% of total exports. Kazakhstan exported 5% of its total exports to Russia and 1% to Belarus in 2010. The relative importance of Russia and Belarus for Kazakhstan is quite small. Russia exported 2% of its total exports to Kazakhstan and surprisingly enough 0% to Belarus. According to the IMF data the zero exports from Russia to Belarus also took place in 2009<sup>28</sup>.

The analysis of the export composition of the CU participants in 2010<sup>29</sup> reveals that Belarus exported mainly three categories of products to Russia and Kazakhstan in quite the same shares: 27% - food

<sup>28</sup> This contradicts with the statistics provided by the Russian Federal State Statistics Service according to which the exports to Belarus accounted for 6% in 2009 and 5% in 2010 of Russia's total exports. The exports to Kazakhstan were 3% in both years. Nevertheless, the data provided by IMF DOTs is leading in this study.

<sup>29</sup> See table 9.3 in the appendix for the detailed information on the top ten export destinations for each country.

and beverages, 20% - manufactured goods classified chiefly by materials, 30% - machinery and transport equipment.

Contrary to the Kazakh export composition to the EU and rest of the world, which is for 90% represented by mineral fuels; Kazakh exports to Russia are more diversified: inedible crude materials and animal fats accounted for 39% of total exports, mineral fuels with - 28% and manufactured goods classified chiefly by material - 20%.

Russia<sup>30</sup> exported mainly mineral fuels to Belarus which accounted for 60% of its total exports to the country. Mineral fuels were also the main export category to Kazakhstan, which accounted for 28% of the total exports to the country.

The export composition and destinations of the CU members in 2010 is not expected to be drastically different for the years during the CU formation. This means that out of three CU members only Belarus had intensive export relations with Russia while the rest of the members exported most of their products to other destinations and their export composition was not very diversified. It is possible that Kazakhstan and Russia seek further diversification of their exports to the CU members. With the fuel dominated exports to the rest of the world, Russia and Kazakhstan may need an impulse to further diversify their export composition at least in the CU context. However, further development of export flows between the CU members will highly depend on the competitiveness of each country's products.

The overall effect of the membership of the CU should give a positive impact on the intra-CU export flows due to the zero tariff rates, abolition of the customs controls, adoption of the single system of phytosanitary norms, single system of customs regulation and procedures, etc. However, the positive effect from the CU on the intra-CU exports may take a couple of years to become statistically significant.

In the present study the dummy for the participation in the CU was coded as unity for the member countries starting in the year 2007 – to account for the anticipation effect of CU formation – thus the total duration of the CU effect is four years, with half a year of officially operational CU.

The fact that the creation of the CU coincided with the global financial crisis is expected to have a negative influence on the internal export flows of the CU members. Next to this, Russia probably under traded with Belarus and Kazakhstan and Kazakhstan under traded with Belarus and Russia in the analysed period of the CU due to their earlier export reorientation to the countries of the EU and rest of the world. In the period of CU formation and its official existence the internal export flows between the CU members showed a positive development only in case of Belarus. Therefore the overall effect of the CU is expected to be negative for the analysed period. Hypothesis #6 for the intra-CU exports is as follows:

*H<sub>0</sub>: The level of exports between the CU members is in line with the normal level predicted by the gravity model (coefficient of the dummy CUBKR2 is not significant)*

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<sup>30</sup> Calculations made on basis of data available in the report "Russia and the CIS 2010" by Russian Federal State Statistics Service available at [http://www.gks.ru/bgd/regl/b10\\_05/lssWWW.exe/Stg/d04/02-04.htm](http://www.gks.ru/bgd/regl/b10_05/lssWWW.exe/Stg/d04/02-04.htm).

$H_1$ : *The level of exports between the CU members is below the normal level predicted by the gravity model (coefficient of the dummy CUBKR2 is negative and significant)*

### **3.3.2 Exports of CU BKR members to other CIS countries**

The membership in the customs union of Belarus, Kazakhstan and Russia is not expected to influence the exports of the CU members to the remaining CIS countries negatively in the analysed period.

The export of products between the CU members became cheaper due to the zero import tariffs in 2010. At the same time the exports from the CU members to the remaining CIS countries still face an import tariff which varies substantially per country as shown in figure 3.4.

These two factors can contribute to an increase of exports between the members of the CU. Whether this possible increase happens at the cost of the exports to the CIS countries depends on the magnitude of the demand for the internal CU market and capacities of the members' economies to meet both demands: the internal and external one from the CIS countries. This argument is applicable for all export categories with exception of mineral fuels.

The structure of Belorussia's exports in 2010 shows that the internal market of the CU is prevailing over the combined market of the CIS: 41% of the exports to the CU against 12% going to the CIS. For Kazakhstan the relations are more equal: the exports to the CIS accounted for 5% of its total exports against 6% to the members of the CU. For Russia the CIS export market was more important with 5% of total exports against 2% to the CU members.

Based on the export structure and composition of the CU members one can expect that extra exports due to the zero tariffs between the CU members will have the largest impact on the Belorussian economy. The possible trade diversion effect of the CU formation is more likely for Belarus rather than for Kazakhstan or Russia. In case of the latter two countries, their export composition to the oil and gas dependent CIS countries is heavily represented by mineral fuels. However, the role of Belarus as a re-exporter should also not be underestimated.

For example, according to the UN Comtrade data the exports of mineral fuels to Ukraine, the largest CIS economy outside the CU, composed 25% of total Russian exports to Ukraine in 2010 and 76% of total Kazakh's exports and 61% of total Belorussian exports<sup>31</sup>. The export flows from the CU members to Ukraine, Uzbekistan, Moldova, Tajikistan and Kyrgyzstan bear a substantial share of mineral fuels which is expected to be less sensitive to changes of trade policies due to the CU formation. The remaining countries like Azerbaijan (Turkmenistan) are oil (gas) rich themselves, so they might be affected to a larger scale by the changes in the import tariffs scheme of the CU. Armenia, which imports its major part of oil and gas from Russia, but the share of imported mineral fuels is quite small in the total Russian exports to the country, may also experience some trade diversion effect.

Summing up, the export composition of the CU members to the majority of the CIS countries is characterised by a substantial share of mineral fuels which are expected to be less sensitive to the changes in the import tariff schemes between the CU members. The importance of the internal market of the CU is largest for Belarus; Kazakhstan has nearly the same exports shares to the CU and the CIS contrary to Russia which exports more to the CIS than to CU members. The possible trade

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<sup>31</sup>See table 9.5 in the appendix for a complete overview of the export share of mineral fuels from the CU members to the CIS countries.

diversion effect in favour of the CU members is not expected to significantly affect the exports flows of CU members to the CIS countries which are net importers of oil and gas (Ukraine, Armenia, Moldova, Tajikistan and Kyrgyzstan). Since these countries form a majority of the analysed CIS countries, the overall effect of CU formation on the export flows of BKR is expected to be neutral.

Hypothesis #7 for the exports from the BKR CU to the CIS countries is:

*H<sub>0</sub>: The level of exports from the CU members to the CIS countries is in line with the normal level predicted by the gravity model (coefficient of the dummy CUBKR\_CIS is not significant)*

*H<sub>1</sub>: The level of exports from the CU members to the CIS countries is below the normal level predicted by the gravity model (coefficient of the dummy CUBKR\_CIS is negative and significant)*

### **3.3.3 Exports of CIS countries to BKR CU members**

The fact that at the end of 2011 the eight CIS countries signed a new multilateral free trade area agreement apparently means that the bilateral free trade agreements with the current CU members which were concluded in the mid 90s did not function effectively any more. Therefore this study assumes that the CIS countries outside the CU probably no longer export their goods under the existing FTAs with Belarus, Kazakhstan and Russia or the existing FTA's are valid only for a limited scope of goods.

The present study assumes that the exports from the CIS countries faced an average tariff rate applied separately by each future member of the CU until 2009 and the common external tariff applied by CU members in 2010. It should be mentioned that the present common external tariff of 10.6% in the CU is higher than any of the tariffs applied by the members in 2009. For comparison, the average applied tariff rate of Belarus in 2009 was 6.48%, in Kazakhstan 4.83% and in Russia 6.72%.

The increase of the tariff rate is expected to negatively influence the export from the CIS countries which are not members of the Customs Unions between Belarus, Kazakhstan and Russia. Hypothesis #8 for the exports from the CIS countries to the CU BKR is:

*H<sub>0</sub>: The level of exports from the CIS countries to the CU members is in line with the normal level predicted by the gravity model (coefficient of the dummy CIS\_CUBKR is not significant)*

*H<sub>1</sub>: The level of exports from the CIS countries to the CU members is below the normal level predicted by the gravity model (coefficient of the dummy CIS\_CUBKR is negative and significant)*

### **3.3.4 Summary of Hypotheses**

The overview of the outlined hypotheses is given in table 3.8. It remains the question of empirical testing to discover how the WTO membership and integration initiatives like the EU and the CU BKR influence the export flows of the CIS countries and the participating countries in the above mentioned organisation/ integration projects.



Table 3.8

Hypothesis No.	The dummy	H <sub>0</sub>	The expected sign under H <sub>1</sub>
1	CIS2	not significant	+
2	CISEU	not significant	-
3	EUCIS	not significant	-
4	CISnonWTO_WTO	not significant	-
5	WTO_CISnonWTO	not significant	-
6	CUBKR2	not significant	-
7	CUBKR_CIS	not significant	-
8	CIS_CUBKR	not significant	-

## 4. Methodology and data

### 4.1 Theory on applied econometric models

The policy options of the CIS countries are analysed by means of the gravity model on panel data set of the bilateral export flows between 47 countries. To the set of countries belong the twelve CIS countries, the twenty- seven EU members<sup>32</sup>, the three candidate countries to join the EU (Croatia, Macedonia and Turkey) and five control countries to represent the rest of the world (Canada, China, Japan, Switzerland and the USA). The time span available for the analysis is 19 years due to limited data availability. In the first year of the independence of the CIS countries there is almost no data available on the economic indicators for these countries; therefore the analysed period is from 1992 to 2010.

The analysed export flows for the CIS countries represent 87% of the total export flows of these countries in the period 1992-2010. The best coverage in the sample is for Belarus, Georgia, Moldova and Tajikistan with an analysed percentage of above 90%. The analysed export flows of Azerbaijan and Ukraine represent 77% of their total exports. The export flows of the remaining CIS countries range from 81% to 89%.

The formal analysis of the policy options of the CIS countries is done by means of the one and two-way error component models which allow for bilateral fixed effects when the fixed effects estimator is used or for random effects when the random effects estimator is used. Depending on the economic and econometric relevance the choice between the fixed of random effects methods is made.

From an economic point of view the random effects method is more favourable as it allows capturing the effect of unobservable time invariant variables which may influence some explanatory variables and subsequently the volume of trade (Rault *et al.* 2008). The random effects estimator assumes that the data is randomly selected from a larger population or, in case of countries, that the data is obtained for a randomly drawn sample of counties.

The random effects estimator uses two sources of information: firstly – from variation in the explanatory variables and dependent variable over time for each individual and secondly – on changes in the dependent variable across individuals and its relation to the different values of the

<sup>32</sup> To the 27 EU members belong: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, The Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

explanatory variables for those individuals (Hill *et al.* 2008). The requirement for the unbiased and consistent estimation though is the strict exogeneity of the regressors. The random effects estimator uses a generalised least squares estimation procedure which delivers a greater precision in large samples.

In econometric terms, the strict exogeneity of the regressors, as required by the random effects estimator, is not always the case. The variables like GDP or infrastructure may be correlated with the unobserved effects. Therefore the fixed effects estimation is often preferred to the random effect estimation in gravity models because correlation of the unobserved effects with some of explanatory variables is quite plausible (Baier and Bergstrand, 2005).

Considering the sample selection issue, Egger (2000) emphasises that fixed effects estimator is preferable to the random effects estimator when the focus of the research is pointed at defining of the integration effects between the beforehand predetermined selection of countries. Contrary to this, in case of large country samples when the researcher is primarily interested in the effects of some variables on trade volume (like transportation costs), the country specific effects can be considered as random, which implies the use of the random effects estimator.

The fixed effects estimator does not allow for the estimation of the time-invariant variables for each individual. It uses the least squares estimation procedure which considers information only from variation in the explanatory variables and dependent variable over time for each individual. This method ignores the variations across individuals as certain specific characteristics of an individual can be correlated with the explanatory variable(s).

Formally the preferred estimator can be checked by the Hausman test which tests the null hypothesis of no correlation between the explanatory variables and the error term and allows the choice between the fixed and random effects method.

The one-way error component model explains the dependent variable  $y_{it}$  by the set of  $K$  explanatory variables  $X_{it}$  and the unobservable individual effects  $\alpha_i$ . The disturbances  $u_{it}$  are decomposed into two components:  $\alpha_i$  - which represents the unobserved individual-specific effects that influence the dependent variable but do not vary over time; and  $v_{it}$  - which represents the remainder disturbance.

Following the notation used by Baltagi *et al.* (2008), the general one-way error components model can be written as follows:

$$y_{it} = \beta_0 + \sum_{k=1}^K \beta_k x_{it} + u_{it}, \quad i, j = 1, \dots, N; i \neq j; t = 1, \dots, T \quad \text{with } u_{it} = \alpha_i + v_{it}$$

where  $N$  is the number of countries,  $T$  is the number of annual observations and  $u_{it}$  is the disturbance term. The unobserved individual effects  $\alpha_i$  are assumed to be parameters which need to be estimated. This model requires strict exogeneity of the regressors, i. e. the expected value of the individual effects  $\alpha_i$  and the disturbance remainder  $v_{it}$  should not depend on any of the explanatory variables (at all times for  $v_{it}$ ). Next to this,  $\alpha_i$  and  $v_{it}$  are both assumed to be normally distributed, serially uncorrelated and homoskedastic.

In this study the one-way error model is applied with the country specific effects and country pair specific effects.

In case of country specific effects, the model takes the following form:

$$y_{ijt} = \beta_0 + \sum_{k=1}^K \beta_k x_{ijkt} + u_{ijt}, \quad i, j = 1, \dots, N; i \neq j; t = 1, \dots, T \quad \text{with } u_{ijt} = \alpha_i + \alpha_j + v_{ijt} \quad (1)$$

This model is estimated with the 2N country fixed effects  $\alpha_i$  and  $\alpha_j$  which in the analysed dataset in this study comes down to 94 fixed country effects. In accordance with Feenstra (2004), the application of fixed effects, which are seen as source and destination region fixed effects, gives the consistent estimates that account for the multilateral resistance terms which measure the resistance of country  $i$  and  $j$  to trade with the other regions of the world. Therefore, the model is estimated with the use of importer and exporter dummies which control for the time-invariant country-specific heterogeneity.

In case of country pair fixed effects, the model takes the following form:

$$y_{ijt} = \beta_0 + \sum_{k=1}^K \beta_k x_{ijkt} + u_{ijt}, \quad i, j = 1, \dots, N; i \neq j; t = 1, \dots, T \quad \text{with } u_{ijt} = \alpha_{ij} + v_{ijt} \quad (2)$$

This model involves estimation of the  $N(N-1)$  time-invariant country pair parameters  $\alpha_{ij}$  which in the analysis in this study comes down to 2,162 country pair fixed effects. These country pair fixed effects control for all bilateral features between the two countries that influence the trade flows. The gravity variables like distance, language and contiguity are therefore excluded from the model.

The two-way error component model allows for specific time effects which account for the unobserved factors that are assumed to affect all individuals in a similar way at a given point in time. The individual and time effects are incorporated in the model through the disturbance term which is decomposed into three terms:  $\alpha_i$  - represents the unobserved individual-specific effects that influence the dependent variable but do not vary over time;  $\lambda_t$  - represents the unobservable time effect and  $v_{it}$  - which represents the remainder disturbance.

The general form of the two-way error component model is similar to the one of the one-way error component model. The only difference is the extra term in the disturbance structure.

$$y_{it} = \beta_0 + \sum_{k=1}^K \beta_k x_{ikt} + u_{it}, \quad i, j = 1, \dots, N; i \neq j; t = 1, \dots, T \quad \text{with } u_{it} = \alpha_i + \lambda_t + v_{it}$$

The number of unobserved time effects equals  $T$ .

In case of country fixed effects, the model takes the following form:

$$y_{ijt} = \beta_0 + \sum_{k=1}^K \beta_k x_{ijkt} + u_{ijt}, \quad i, j = 1, \dots, N; i \neq j; t = 1, \dots, T$$

with  $u_{ijt} = \alpha_i + \alpha_j + \lambda_t + v_{ijt}$  (3)

The corresponding two-way error component model for the country pairs is:

$$y_{ijt} = \beta_0 + \sum_{k=1}^K \beta_k x_{ijkt} + u_{ijt}, \quad i, j = 1, \dots, N; i \neq j; t = 1, \dots, T \quad \text{with } u_{ijt} = \alpha_{ij} + \lambda_t + v_{ijt} \quad (4)$$

The choice of the best model out of the four specifications is done in two stages. First the fixed time effects are tested in models with country-pair and country fixed effects with the help of the likelihood ratio test. On basis of the outcome of the first test, the two best models are compared again with the likelihood ratio test like in Baltagi et al. (2003) and Brouwer *et al.* (2008) to define the best model specification.

## 4.2 Definition of the variables

The full list of definitions and sources of the variables used in this study are given in table 9.6 in the appendix. The variables can be grouped in the following way:

- 1) **The traditional gravity variables:** natural log of the nominal bilateral export flows from country  $i$  to country  $j$  ( $\ln X_{ijt}$ ), nominal GDP of exporting and importing countries ( $GDP_{it}$ ,  $GDP_{jt}$ ), distance between the capital cities ( $\ln \text{Distance}_{ij}$ ) and the common Language;
- 2) **The border effect** which is expressed by the dummy  $\text{Contiguity}_{ij}$  for having a common border between the countries;
- 3) **The trade policy variables:** dummies for the WTO membership; the EU membership; the membership in Customs Union between Belarus, Kazakhstan and Russia; the membership in the CIS; the FTA with the EU dummy; the applied MFN tariff rate by the importing country ( $\text{Tariff}_{jt}$ );
- 4) **The macro and micro indicators:**
  - the bilateral exchange rate<sup>33</sup> is expressed as the natural log of the number of units of an exporter's currency versus USD per number of units of importer's currency versus USD ( $\ln \text{Xrate}_{ijt}$ );
  - the bilateral exchange rate volatility<sup>34</sup> is measured by a natural log of the rolling coefficient of variation of bilateral exchange rate with the 12 months window ( $\ln \text{Volatility}_{ijt}$ );
  - the bilateral trade balance is measured by the log of bilateral exports minus the log of bilateral imports ( $\text{TB}_{ijt}$ );
  - the oil price is introduced to represent the price index ( $\text{Oil price}_t$ );
  - inflation in the exporting country is measured by a consumer price index in annual percentage change ( $\text{Inflation}_{it}$ ). The inflation variable is introduced to correct for the periods of hyperinflation in the CIS countries at the begin of the 90s;
- 5) **The governance variables** are taken from the World Bank's database of Worldwide Governance Indicators and calculated separately for the exporting and the importing country as a simple average of six indicators. These six indicators represent quality of governance in the three main areas:<sup>35</sup>
  - 1) Selection, monitoring and replacement process of governments (measured by the indicators: voice and accountability, political stability and absence of violence);
  - 2) Capacity of the government to formulate and implement sound policies (measured by the indicators: government effectiveness and regulatory quality);
  - 3) Respect for institutions that govern economic and social interactions among citizens and the state (measured by the indicators: rule of law and control of corruption);
- 6) **The infrastructure variables** are represented by the Logistics Performance Index from the World Bank's database which measures the quality of trade and transport-related infrastructure. The infrastructure variables enter separately for the exporting and the importing country ( $\text{Infrastructure}_{it}$  and  $\text{Infrastructure}_{jt}$ ).

The use of trade policy dummies deserves some special attention. Apart from estimating the impact of an integrating block or organisation (dummies EU2, CU BKR2, WTO2), two more dummies are

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<sup>33</sup> A bilateral exchange rate was included in the gravity studies of Micco *et al.* (2003), Carère (2006) and Brouwer *et al.* (2008).

<sup>34</sup> Volatility of the bilateral exchange rate was included into the gravity model by Rose (2000), Fidrmuc *et al.* (2001) and Brouwer *et al.* (2008).

<sup>35</sup> According to methodology of Kaufmann *et al.* (2010).

included in the study for evaluation of the trade creation and trade diversion nature of the above mentioned blocks with respect to the CIS countries.<sup>36</sup> The inclusion of these extra dummies and evaluation of the TC and TD effects with regard to the CIS countries becomes possible since this study considers the directional bilateral export flows, that is, export flows from country  $i$  to country  $j$  and export flows from country  $j$  to country  $i$ .

Therefore each trade policy variable indicating an integrating economic block or organisation is represented by three dummies (example for the EU):

- 1) Dummy EU2 = 1 when both countries belong to the EU, zero otherwise. This dummy captures the intra-block trade. The positive coefficient will indicate the trade creation within the block;
- 2) Dummy EUCIS = 1 when country  $i$  is EU member and country  $j$  is a CIS member, zero otherwise. This dummy captures the block's exports to the CIS. The positive (negative) coefficient will indicate the trade creation (diversion) effect of the EU for the CIS countries;
- 3) Dummy CISEU = 1 when country  $i$  is a CIS member and country  $j$  is EU member, zero otherwise. This dummy captures the block's imports from the CIS. The positive (negative) coefficient will indicate the trade creation (diversion) of the EU for the CIS countries.

In order to account for the possible "anticipation effect" of the establishment of the Customs Union between Belarus, Kazakhstan and Russia, the three dummies related to the Customs Union consider these countries as members of the CU from 2007 – the year of the official announcement to establish the CU up till 2010 – the last year in the current analysis.

Next to the three CU dummies (CUBKR2, CUBKR\_CIS and CIS\_CUBKR) an extra dummy BKR2 was included into the analysis which referred to the export flows between Belarus, Kazakhstan and Russia in the period 1992-2009. This extra dummy was included to control for the export flows between the CU members before the actual Customs Union becoming operational. In this way the possible bias in the Customs Union effect due to the historical export ties between the current members of the CU was taken care of.

Another point of attention is the use of the product  $TB_{ijt} * \ln Volatility_{ijt}$  to account for the impact of volatility on the level of exports in the model. Volatility of the major world currencies and therefore of the bilateral exchange rates can affect the volume of trade. According to the separation theorem<sup>37</sup>, in case of access to a forward exchange market, the level of exports is independent of the volatility of the exchange rate. But if there is no access to the forward exchange market for the trading firms, then volatility has a negative impact on the level of trade.

Solving the separation theorem in the general equilibrium framework, Viaene *et al.* (1992) showed that the equilibrium forward rate depends negatively on the product of volatility and the net foreign currency exposure of the country. Since the bilateral trade balance can be seen as a proxy for the net foreign currency exposure, the impact of the volatility on export will depend on the sign of the trade balance. The increased volatility in combination with the negative trade balance will lead to an increase in the forward exchange rate which means depreciation of the home currency and therefore

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<sup>36</sup> A similar use of dummies was applied by Carère (2006) and Ruiz *et al.* (2007).

<sup>37</sup> See Bowen, H.P., Hollander, A. and Viaene, J.-M., (forthcoming), *Applied International Trade*, (Palgrave Macmillan, 2nd ed.), Chapter 13.

increase of the exports. Contrary to this, the increased volatility in combination with a positive trade balance will lead to the decrease of the forward exchange rate which means appreciation of the home currency and decrease of the exports.

### 4.3 Testing of the models

Empirical testing of the policy options has been made in two stages which are further described in corresponding subsections. In the first stage different econometric models have been estimated on the reduced model specification in order to define the best econometric model. In the second stage the specification of the best model has been extended with extra variables to check their impact on the level of exports.

#### 4.3.1 Choosing the best econometric model

The estimation of the equations 1-5 was made with the use of panel least squares in EViews 7.0.

It proved to be impossible to choose the best econometric model using the extended model specification as the two-way error component model with the country and time fixed effects turned out to be the most rigid showing the signs of multicollinearity when extra variables were to be added. This was due to a large number of dummy variables because the fixed effects for the importer and the exporter country as well as the time fixed effects were introduced by means of a dummy.

The selection of the best model specification has been made using the following reduced model specification:

$$\begin{aligned} \ln X_{ijt} = & \beta_0 + \beta_1 \ln Y_{it} + \beta_2 \ln Y_{jt} + \\ & \beta_3 \text{CIS2} + \beta_4 \text{EU2} + \beta_5 \text{FTA} + \beta_6 \text{CISEU} + \beta_7 \text{EUCIS} + \\ & \beta_8 \text{WTO2} + \beta_9 \text{CISnonWTO\_WTO} + \beta_{10} \text{WTO\_CISnonWTO} + \\ & \beta_{11} \text{BKR2} + \beta_{12} \text{CUBKR2} + \beta_{13} \text{CUBKR\_CIS} + \beta_{14} \text{CIS\_CUBKR} + \\ & \beta_{15} \ln X_{rate_{ijt}} + \beta_{16} \text{TB}_{ijt} * \ln \text{Volatility}_{ijt} + \\ & (\beta_{17} \ln \text{Distance}) + (\beta_{18} \text{Language}) + (\beta_{19} \text{Contiguity}) + u_{ijt} \end{aligned}$$

For the model with country fixed effects, Eq. (1), and the model with country fixed and time fixed effects, Eq. (3), variables like distance, language and contiguity are possible to estimate because the fixed effects are introduced by means of country and time dummies into the models. These model specifications are also called least squares dummy variable models. One should note that these models do not have a constant, as inclusion of the full set of country dummies together with the constant would cause multicollinearity.

In the model with country pair fixed effects, Eq.(2), and the model with the country pair fixed and time fixed effects, Eq.(4), the time invariant variables are not possible to estimate as they are subsumed in the country pair fixed effects. The country pair fixed effects include the effects of all omitted variables which are specific to a cross section, but are constant over time (variables like distance, common language and contiguity). Econometrically the estimation of the time invariant variable will fail because the fixed effects estimator includes a dummy variable for each cross section being 1 for all time periods of that cross section and zero otherwise. Any time-invariant variable will be exactly collinear with this dummy; therefore in the fixed effects model it is impossible to estimate

the variables which are constant for each cross section across time<sup>38</sup>. The constant is present in these models because EViews expresses the country pair fixed effects as the difference from the overall intercept.

The error term  $u_{ijt}$  differs throughout the four specifications as has been described in the section 4.1. The estimation results of the four specifications are presented in table 4.1.

Table 4.1

Dependent variable: Ln Exports Method: Panel Least Squares				
	Eq.(1)	Eq.(2)	Eq. (3)	Eq.(4)
	Country FE	Country pair FE	Country FE, time FE	Country pair FE, time FE
LnGDP <sub>it</sub>	0.574 (0.000)	0.563 (0.000)	0.734 (0.000)	0.638 (0.000)
LnGDP <sub>jt</sub>	0.733 (0.000)	0.672 (0.000)	0.888 (0.000)	0.743 (0.000)
CIS2	1.687 (0.000)	0.653 (0.000)	1.665 (0.000)	0.677 (0.000)
EU2	0.147 (0.000)	0.392 (0.000)	0.142 (0.000)	0.387 (0.000)
FTA	-0.063 (0.037)	0.226 (0.000)	-0.081 (0.008)	0.213 (0.000)
CISEU	-0.928 (0.000)	-0.429 (0.000)	-0.937 (0.000)	-0.448 (0.000)
EUCIS	-0.471 (0.000)	-0.025 (0.527)	-0.481 (0.000)	-0.043 (0.280)
WTO2	0.205 (0.000)	0.223 (0.000)	0.138 (0.000)	0.143 (0.000)
CISNONWTO_WTO	-0.293 (0.000)	-0.113 (0.000)	-0.353 (0.000)	-0.186 (0.000)
WTO_CISNONWTO	-0.069 (0.108)	-0.020 (0.546)	-0.132 (0.004)	-0.094 (0.008)
BKR2	-0.886 (0.000)	0.210 (0.654)	-0.909 (0.000)	0.152 (0.745)
CUBKR2	-0.740 (0.023)	-0.350 (0.163)	-0.812 (0.012)	-0.382 (0.127)
CUBKR_CIS	-0.402 (0.009)	0.093 (0.407)	-0.439 (0.004)	0.106 (0.346)
CIS_CUBKR	-0.602 (0.000)	-0.626 (0.000)	-0.641 (0.000)	-0.613 (0.000)
LnX RATE <sub>ijt</sub>	0,002 (0.722)	0.002 (0.435)	0.002 (0.695)	0.003 (0.376)
TB*LnVol <sub>ijt</sub>	-0,001 (0.007)	-0.002 (0.000)	-0.001 (0.009)	-0.002 (0.000)
LnDistance	-1.327 (0.000)		-1.325 (0.000)	
Language	0.584 (0.000)		0.588 (0.000)	
Contiguity	0.364 (0.000)		0.361 (0.000)	
Constant		-10.205 (0.000)		-11.791 (0.000)
No. of observations	33930	33930	33930	33930
R-squared	0.816	0.925	0.817	0.925
Adjusted R-squared	0.816	0.920	0.816	0.920
R-squared within	0.509	0.441	0.457	0.201

Notes: (i) country and time fixed effects are not reported; (ii) p-values are in the parentheses; (iii) R-squared within is calculated as 1-(sum of squared residuals of the full model/ sum of the squared residuals of the fixed effects only).

<sup>38</sup> See Hill *et al.* (2008), *Principles of Econometrics*, Chapter 15, 397.

As one could expect of the gravity regressions, all four models give high explanatory power. The relatively low values of the R-squared within imply that the dependent and explanatory variables do not change quite a lot over time for each cross section.

In order to choose the best specification of the gravity model, the likelihood ratio tests for the inclusion of the time fixed effects are applied for two cases: one for the inclusion of the time fixed effects in the country fixed effects model and the second one in the country pair fixed effects model. With the dataset comprising 19 periods, the degrees of freedom for the time fixed effects become  $19-1=18$ .

Table 4.2

The LR tests for the inclusion of the time fixed effects			
H <sub>0</sub>	Eq. (1) (country FE)	H <sub>0</sub>	Eq. (2) (country pair FE)
H <sub>1</sub>	Eq. (3) (country FE and time FE)	H <sub>1</sub>	Eq. (4) (country pair FE and time FE)
LR statistic	128.2292	LR statistic	185.227
d.o.f.	18	d.o.f.	18
p-Value	0.000	p-Value	0.000

The results in table 4.2 lead to the conclusion that the time fixed effects are present in both models with country fixed effects and country pair fixed effects. With the p-value of  $0.000 \ll 0.005$ , there is strong evidence for the presence of the time fixed effects in both specifications, therefore the H<sub>0</sub> of no time fixed effects is rejected in both cases.

The following step of the true model selection will be application of the likelihood ratio test on the specification with the country and time fixed effects - Eq.(3) versus the specification with the country-pair and time fixed effects - Eq.(4).

Following Brouwer *et al.* (2008) the degrees of freedom for this likelihood ratio test are calculated as the sum of the fixed effects in the restricted model and full model minus one degree of freedom for time fixed effect and minus one degree of freedom for cross-section fixed effect. The country fixed effects and time fixed effects in the restricted model sum up to 66 (47 countries + 19 periods) and the country-pair fixed effects and time effects in the full model sum up to 2,133 (2,114 cross sections + 19 years). The degrees of freedom for the likelihood ratio test become  $66+2133-1-1=2,197$ .

Table 4.3

The LR test of fixed effects	
H <sub>0</sub>	Eq. (3) (country FE and time FE)
H <sub>1</sub>	Eq. (5) (country pair FE and time FE)
LR test	30344.92
d.o.f.	2221
p-Value	0.000

The p-value of 0.000 of the LR test in table 4.3 leads to the rejection of H<sub>0</sub> that the specification with the country fixed effects and time fixed effects is the true model at any conventional significance level. This makes the model with the country pair and time fixed effects Eq. (4) the preferred model.

This outcome lies in line with earlier findings (Carèrre (2006), Cheng *et al.* (2005) and Brouwer *et al.* (2008)). As noted by Cheng *et al.* (2005) the model with the three specific effects (exporter, importer



and time effects), which corresponds to the Eq. (3) in this study, is only a restricted version of the more general model that allows for country pair heterogeneity.

Additional benefit from the country pair FE and time FE model being the best model, is the elimination of the necessity to include distance variable into the regression. Most commonly, distance is measured between the capital cities of the two countries but it does not reflect the other economic centra of large countries and it does not reflect the differences in the costs of transportation by land compared to oversee transportation.

The model with the country pair and time fixed Eq. (4) will be further extended with a number of variables which are believed to be important for the analysis of the trade flows of transition economies.

#### 4.3.2 Extending the specification of the best model

Considering the fact that the majority of the CIS economies are still in the mid of the transitional process, it seems necessary to extend the specification of the selected model with a number of variables which indicate the transitional progress of the countries and create a broader context for evaluation of the export flows.

There is a broad consensus about the importance of the institutional reforms and good governance for the successful transition process in the CIS countries. In order to evaluate the effect of good governance on the export performance, this study includes the governance variable for exporting and importing countries, which is comprised of the data for six key governance indicators.

Another extension of the model specification is the infrastructure variable for exporting and importing countries which measures the quality of trade and transport related infrastructure. A well developed infrastructure is expected to have a positive effect on the export flows.

Among other variables added to the model there are: the average tariff rate applied by the importing country which is expected to be negatively related to the exports; the annual inflation rate of the exporting country which is expected to be positively related to exports and the oil price to represent the price index.

The extended model specification based on the best model Eq. (4) becomes:

$$\begin{aligned} \ln X_{ijt} = & \beta_0 + \beta_1 \ln Y_{it} + \beta_2 \ln Y_{jt} + \beta_3 \text{CIS2} + \beta_4 \text{EU2} + \beta_5 \text{FTA} + \beta_6 \text{CISEU} + \beta_7 \text{EUCIS} + \\ & \beta_8 \text{WTO2} + \beta_9 \text{CISnonWTO\_WTO} + \beta_{10} \text{WTO\_CISnonWTO} + \\ & \beta_{11} \text{BKR2} + \beta_{12} \text{CUBKR2} + \beta_{13} \text{CUBKR\_CIS} + \beta_{14} \text{CIS\_CUBKR} + \\ & \beta_{15} \ln X_{rate_{ijt}} + \beta_{16} \text{TB}_{ijt} * \ln \text{Volatility}_{ijt} + \beta_{17} \text{Oil price}_t + \\ & \beta_{18} \text{Governance}_{it} + \beta_{19} \text{Infrastructure}_{it} + \beta_{20} \text{Inflation}_{it} + \\ & \beta_{21} \text{Tariff}_{jt} + \beta_{22} \text{Governance}_{jt} + \beta_{23} \text{Infrastructure}_{jt} + u_{ijt} \end{aligned}$$

where

$$i, j = 1, \dots, N; i \neq j; t = 1, \dots, T; u_{ijt} = \alpha_{ij} + \lambda_t + v_{ijt} \quad (5)$$

The results of the extended regression are presented in table 4.4.

Table 4.4

Dependent variable: Ln Exports		Eq.(5)	
Method: Panel Least Squares		Country pair FE, time FE	
LnGDP <sub>it</sub>	0.587	(0.000)	
LnGDP <sub>jt</sub>	0.775	(0.000)	
CIS2	0.535	(0.000)	
EU2	0.228	(0.000)	
FTA	0.080	(0.001)	
CISEU	-0.475	(0.000)	
EUCIS	-0.086	(0.031)	
WTO2	0.119	(0.000)	
CISNONWTO_WTO	-0.107	(0.045)	
WTO_CISNONWTO	-0.008	(0.860)	
BKR2	0.215	(0.625)	
CUBKR2	-0.472	(0.000)	
CUBKR_CIS	-0.069	(0.437)	
CIS_CUBKR	-0.642	(0.000)	
LnX rate <sub>ijt</sub>	0.015	(0.000)	
TB*LnVol <sub>ijt</sub>	-0.003	(0.000)	
Oil price	-0.005	(0.914)	
Governance <sub>it</sub>	0.429	(0.000)	
Infrastructure <sub>it</sub>	0.191	(0.006)	
Inflation <sub>it</sub>	0.0005	(0.000)	
Tariff <sub>jt</sub>	-0.0003	(0.474)	
Governance <sub>jt</sub>	0.144	(0.002)	
Infrastructure <sub>jt</sub>	0.033	(0.605)	
Constant	-12.315	(0.000)	
No. of observations	27002		
R-squared	0.939		
Adjusted R-squared	0.933		
R-squared within	0.477		

Notes:

- (i) p-values are in the parentheses;
- (ii) R-squared within = 1-(SSR of the full model/ SSR of the fixed effects only);
- (iii) Estimated with White diagonal standard errors & covariance (d.f. corrected).

A number of tests has been executed to check the underlying assumptions of the presented model Eq. (5).

The assumption of the normally distributed regression errors has been tested by means of a Jarque-Bera test<sup>39</sup>. The Jarque-Bera statistic of 238101.7 and the corresponding p-value of 0.000 <<0.05 lead to the rejection of the H<sub>0</sub> of normally distributed regression errors. There is strong evidence that the

<sup>39</sup> The Eviews output of the test can be found in table 9.7 in the appendix.

errors are not normally distributed. As possible solutions for not normally distributed errors Hill *et al.* (2008) suggests either a change of the functional form of the model or transformation of the dependent variable. The currently used additive specification is preferred in this study due to the ease of interpretation. Transformation of the dependent variable is not feasible since it has already been taken to the natural logarithm.

Assumption of homoskedastic residuals is formally tested by means of a Breusch-Pagan Test. Heteroskedasticity can be inherent either to cross-sectional or time-series data or both. In the first case the error variance can differ due to the fact that cross sectional data often refer to the observations of varying sizes. In the second case changes in the error variance can be due to the external shock or changes in the circumstances which influence the dependent variable.

Execution of the Breusch-Pagan test involves the estimation of the auxiliary regression<sup>40</sup> with the dependent variable of squared residuals from the original regression. The robust version of the Breusch-Pagan test, the Koenker's statistic, does not require the normally distributed errors which is particularly useful in the present study. The Koenker's statistic is calculated as  $N \cdot R^2$ , where  $N$  is the number of observations and  $R^2$  is from the auxiliary regression. The Koenker's statistic is distributed as a  $\chi^2$  with degrees of freedom equal to the number of independent variables in the auxiliary regression<sup>41</sup>. The Koenker's statistic equals 100417.26 (27,002 observations \*  $R^2$  of 0.370293). The critical value of  $\chi^2_{(0.95, 23)}=35.17$ . At a 5% significance level, the  $H_0$  of homoskedasticity is rejected because the test statistic exceeds the critical value of  $\chi^2$ .

In order to correct for the present heteroskedasticity, the original regression was estimated with the use of White diagonal standard errors and covariance. This method is robust to observation specific heteroskedasticity in the disturbances.

The Hausman test has been applied to check whether fixed or random effects should be used in the model. This test compares the coefficients of the estimates in the random effects (RE) model to those of the fixed effects (FE) model. Under the  $H_0$  the disturbance term is not correlated with any of the explanatory variables. Both RE and FE estimators are consistent and yield the same results. The high value of the Hausman  $\chi^2$  statistic and low p-value would give the evidence for correlation of the disturbance term and the explanatory variables, which would imply that the RE estimator is inconsistent and preference should be given to the use of the FE effects estimator.

As the analysed panel is unbalanced, one cannot test two-way random effects simultaneously.

Estimation of the model with the cross-section random effects and application of the Hausman test<sup>42</sup> provides the evidence that the fixed effects estimator is more appropriate in this study. The  $\chi^2$  statistic is 924.54 and the p-value of 0.000 lead to the rejection of the  $H_0$  of no correlation between the explanatory variables and the error term. At any conventional significance level there is strong evidence for endogeneity of the regressors.

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<sup>40</sup> The Eviews output of the original and auxiliary regression can be found in table 9.8 and 9.9 in the appendix.

<sup>41</sup> See Eviews 7 Users Guide II, p.161 and Hill *et al.* (2008), p. 225.

<sup>42</sup> The Eviews output of the Hausman test for the cross-section effects can be found in table 9.10 in the appendix.

Knowing that the mix of random and fixed effects in a model with the unbalanced panel is not allowed, there is only one option left for the time effects – the fixed effects.

The significance of the time fixed effects is further tested by means of the likelihood ratio test. The restricted model is the one with the country pair fixed effects only and the alternative full model has country pair fixed and time fixed effects.

The results of the likelihood ratio test are presented in table 4.5. The p-value of 0.000 leads to the rejection of the  $H_0$  that the model with the country pair fixed effects is the true model. The contribution of the time fixed effects is significant at any conventional significance level.

Table 4.5

The LR test of time fixed effects	
$H_0$	Eq. (5) restricted: country pair FE
$H_1$	Eq. (5) full: country pair FE and time FE
LR test	208.8138
d.o.f.	14
p-Value	0.000

Summing up, a number of assumptions underlying the extended model Eq. (5) have been tested. The model has been corrected for heteroskedasticity, but a normal distribution of errors could not be achieved. The Hausman test for the cross section effects led to the conclusion that estimation with the fixed effects is preferred to the random effect estimation. The time fixed effects proved to be significant on basis of an LR test.

## 5. Discussion of empiric results

The two-way error component model estimated with the country pair and time fixed effect with the extended specification is the preferred model in this study (Eq.5). The results presented in table 4.4 will be discussed in this section. When applicable, reference will be made to the results of the reduced specification models presented in table 4.1. The results will be discussed in the subsections which refer to the type of variables used in the analysis.

### 5.1 Traditional gravity and other variables

The variables like distance, common language and contiguity could not be estimated in the model with country pair fixed and time fixed effects (Eq.5). In line with numerous gravity studies, these variables had the expected signs and were strongly significant in the models with the country fixed and time fixed effects (Eq. 1) and (Eq.3).

Distance had a negative and strongly significant coefficient varying from -1.325 to -1.327 which is greatly in line with the traditional estimates that range between -0.7 (Brower *et al.* 2008) and -1.3 (Rose, 2002).

The common language had a positive and significant coefficient varying from 0.584 to 0.588 which means that on average sharing of a common language increases exports between two countries by 79.32%, which is  $(e^{0.845} - 1) * 100\%$ . A number of studies reported coefficients for common language

varying from 0.32 (Rose, 2002), 0.53-0.62 (Kurmanalieva *et al.* 2011), 0.80 (Micco *et al.* 2003) to 0.95 (Melitz, 2008), which puts the obtained estimates broadly in line with these previous studies.

Variable contiguity had a positive and significant coefficient varying from 0.361 to 0.364. When the lower estimate is considered, sharing a border on average increases exports by 43.48% which is  $(e^{0.361} - 1) * 100\%$ . The border effect is also in line with previous studies which estimate the coefficients of 0.3-0.4 (Brouwer *et al.* 2008), (Kurmanalieva *et al.* 2011).

Coming back to the preferred model (Eq.5), the coefficients estimated for the GDPs of the exporting and importing country do not differ very much from each other, being 0.587 for the exporting country and 0.775 for the importing country. This means that exporting and importing countries affect the bilateral export flows approximately in the same way.

The coefficient of the exchange rate is positive at 0.015 and significant at the 5% significance level. As the bilateral exchange rate is expressed by means of a ratio of the exporter's currency versus USD to the importer's currency versus the USD, increase of the bilateral exchange rate would mean depreciation of the exporter's currency which has a positive influence on the exports.

The volatility expressed by  $TB_{ijt} * \ln Vol_{ijt}$  has a negative coefficient of -0.003 which is strongly significant. The results from the gravity study by Brouwer *et al.* (2008) have a higher negative coefficient of -0.060.

The estimated coefficient for the oil price is negative at -0.005 but is not significant with a p-value of 0.914. The coefficient for inflation in the exporting country has a positive but very small value of 0.0005 which is significant at the 5% significance level. The positive effect on exports could work through the depreciating exporter's currency due to the increase of inflation in the exporting country.

The effect of the combined governance indicators was estimated to be 0.429 for an exporting country and 0.144 for an importing country. Both of the coefficients are strongly significant. A point increase in the combined value of governance indicator of an exporting country would lead on average to a 54% increase in exports. Similarly, a point increase in the combined value of governance variable would lead to a 15% increase of the imports. The magnitude of the governance coefficient is quite high - throughout the model only membership of the CIS of both countries has a larger boosting effect on the exports with a coefficient of 0.535.

The obtained result is comparable to the results in the study by Babecka-Kucharcukova *et al.* (2010) where the benefit from the institutional improvement was found to be the highest among the other (trade) policy options. However, in the Babecka-Kucharcukova study the effect of institutional quality was larger for the importing country with + 40%, while the exporting country gained only 15% in exports due to a point increase in the value of the governance indicator. A possible explanation for the shift in importance of the institutional quality to the side of the exporting country may lie in the change of the payment conditions which could have taken place in the period (2005-2010) which was not covered in the study by Babecka-Kucharcukova. If the majority of the transactions shifted towards advance payments schemes rather than payments based on credits secured by the banks of the importing countries, than the growing importance of the institutional quality of the exporters is quite logical.

The infrastructure was estimated to have a positive coefficient of 0.191 for the exporting country which is significant at the 5% significance level and the coefficient of 0.033 for the importing country which is not significant. For the exporting country improvement of the infrastructure, measured by the Logistics Performance Index, by one point would lead on average to a 21% increase in exports.

## 5.2 Trade policy variables

Among the trade policy variables, the variables which did not have separate defined hypotheses will be discussed first.

**The common membership of the EU**, the dummy EU2, has a positive and strongly significant coefficient of 0.228. This means that on average the exports between the two EU members are **25.66%** higher ( $e^{0.228} - 1$ )\*100% than the exports of countries outside the union. The coefficient of the EU2 dummy was also consistently positive throughout the equations 1-4 which shows the robustness of the positive effect of the EU membership on its members' exports.

The estimations of the impact of the EU membership in other gravity studies give positive but smaller coefficients of 0.127 which corresponds to 13.54% extra export (Brouwer *et al.* 2008), the varying coefficients between 0.042 and 0.80 depending on the specification of the model in Micco *et al.* (2003).

Conclusion of **the FTA with the EU** increases on average the exports between the countries by **8.36%**, which has been approximated as ( $e^{0.080} - 1$ )\*100%. The coefficient 0.080 is significant at any conventional significance level. It should be noted that the coefficient of the FTA dummy is less stable since in models with country fixed effects and country fixed and time fixed effects, the equations (Eq.1) and (Eq.3), the signs of the coefficient were negative.

The estimated effect of 8.36% increase in exports from conclusion of the FTA with the EU for the CIS countries is a bit smaller but quite close to the results obtained in a number of studies: a 13.5% export increase for Georgia (Maliszewska, 2008) and a 14% increase in trade for Bulgaria, Hungary, Poland and Romania (Caporale *et al.* 2008).

**The common membership of the WTO**, dummy WTO2, also has a positive and strongly significant coefficient of 0.119 which means that on average the WTO membership increases exports between its members by **12.58%**. The coefficient is robust: its sign was positive throughout the four models (Eq. 1-4).

The found effect of the WTO membership is comparable to the results obtained in studies by Subramanian *et al.* (2003), who estimated an increase in trade between 14 and 35%; Chang *et al.* (2007), who identified an 22% increase of bilateral trade for the non-members and Kurmanalieva *et al.* (2011), who estimated that membership of the WTO leads to a 13% increase in trade between its members.

The applied MFN tariff by the importing country has an expected negative coefficient of -0.0003, but it is not significant at the 5% level of significance.

Further, the empiric results for the defined hypotheses will be discussed.

### 5.2.1 The CIS and the EU

#### Hypothesis #1: intra-CIS exports

The estimated coefficient of the dummy CIS2 takes the positive value of 0.535 and is significant at any conventional significance level. There is enough evidence to reject  $H_0$  that the intra-CIS exports are in line with the gravity model predictions. The effect of membership of two countries of the CIS is approximated by  $(e^{0.535}-1)*100\%$  which equals 70.80%. This means that **on average the CIS countries export 70.80% more to each other** than they are expected to export based on the predictions of the gravity model.

#### Hypothesis #2: exports from CIS to EU

The coefficient of the dummy CISEU is negative: -0.475 and significant at any conventional significance level which allows the rejection of the  $H_0$  that the level of exports from the CIS countries to the EU is in line with the gravity model predictions. Therefore there is enough evidence to state that **the CIS countries export on average 37.82% less to the EU** than they could do based on the gravity model, which was approximated by  $(e^{-0.475}-1)*100\%$ .

#### Hypothesis #3: exports from EU to CIS

The exports from the EU to the CIS countries have been investigated by means of a EUCIS dummy. It takes a negative value of -0.086 and is significant. With the p-value of 0.031 there is enough evidence to reject the  $H_0$  of the exports from the EU to the CIS being in line with the predictions of the gravity model. **The EU exports on average 8.27% less to the CIS countries**, which was approximated by  $(e^{-0.086}-1)*100\%$ .

The coefficients of two dummies – CIS2 and CISEU – have the same signs and are significant in the four models with the reduced specification (Eq. 1-4). This implies that the estimates of the dummies are robust. The coefficient of the EUCIS dummy also has a negative sign in the models with the reduced specification, but it is not significant in the models with the country pair FE (Eq. 2) and with the country pair FE and time FE (Eq.4).

The estimated effect of the CIS membership on the intra-CIS exports proved to be quite substantial: the CIS countries still export to each other 70.80% more than they are expected according to the gravity model predictions. The estimated effect of the CIS membership in the present study is much lower than the effects found in the recent study by Kurmanalieva *et al.* (2011) who estimated that the CIS countries trade 4.5-10 times more with each other (450-1,000%).

At the same time the CIS countries were found to under-trade with the EU as they export 37.82% less to the EU than they could have done according to the gravity model. This finding may suggest a positive development in export share for the CIS countries as the previous studies, which analysed earlier periods, showed a much higher effect of the missing trade: Babetskii *et al.* (2003) estimated a 60% trade gap between the CIS and the EU; Koukhartchouk *et al.* (2003) estimated that the CIS countries trade with the EU only 31% of the predicted level.

The export flows from the EU to the CIS countries are 8.27% less compared to the normal level estimated by the gravity model. This may indicate the trade diversion effect of the EU in favour of its members. The positive and significant estimates for the exports from the EU to non-EU countries (0.318 in Ruiz *et al.* (2007) and 0.074 in Brouwer *et al.* (2008)) were obtained in a data sample where

the non-EU countries did not include the CIS countries. Therefore one cannot state that the creation of the EU contributed to trade creation for the non-EU members, at least not in case of the CIS countries.

### 5.2.2 The CIS and the WTO

#### Hypothesis #4: exports from CIS non-WTO members to WTO members

The effect of the non-membership of the WTO for a CIS country in terms of their exports to the WTO members has been investigated by means of a CISnonWTO\_WTO dummy. The estimated coefficient of the dummy takes the negative value of -0.107 which is significant with the p-value of  $0.045 < 0.05$ . Therefore there is enough evidence to reject the  $H_0$  that the exports from the CIS countries which are not WTO members to the WTO members are in line with the gravity model predictions. Based on this result one can state that **on average the WTO non-membership reduces the exports of the CIS countries to the WTO members by 10.16%**.

The estimate of the CISnonWTO\_WTO dummy is robust since in the four models with the reduced specifications (Eq. 1-4), the dummy was consistently negative and strongly significant.

The negative impact for Russia due to its non-membership of the WTO was estimated to be in the range of 30-60% of missing trade (Lissovolik *et al.* 2004). The estimate in the present study indicates a lower negative effect which is based on average for all CIS countries with the WTO non-members status.

#### Hypothesis #5: exports from WTO members to CIS non-WTO members

The export flows from the WTO members to the CIS countries which are not WTO members has been investigated by the dummy WTO\_CISnonWTO. The estimate coefficient of the dummy is negative at -0.008 but is not significant with a p-value of  $0.860 > 0.05$  at the 5% level of significance. This result leads to the conclusion that the  $H_0$  of **the exports from the WTO members to the CIS countries without the WTO membership are in line with the gravity model** cannot be rejected.

Comparing this result to the estimates obtained throughout the reduced models (Eq.1-4), no robust results can be presented: the coefficient was negative in all four models but only in two cases it was also significant.

Based on the results from the preferred model 5, the non-membership of the WTO of the CIS countries was not found to have any negative impact on the exports from the WTO members. This finding supports the non-discriminatory character of the WTO members when their exports are concerned. Apparently for the WTO members in the decision to export to the CIS countries which are not WTO members, the attractive size of the potential CIS markets outweighs the negative effect from the absence of the system of trade rules facilitated by the membership of the WTO.

### 5.2.3 The CIS and CU BKR

#### Hypothesis #6: exports between CU countries Belarus, Kazakhstan and Russia

The level of the exports flows between the members of Customs Union of Belarus, Kazakhstan and Russia has been analysed by means of a CUBKR2 dummy. The estimated coefficient is negative at -0.472 and strongly significant with a p-value of 0.000. This result leads to the rejection of the  $H_0$  that the exports between the CU members are in line with the normal level predicted by the gravity model. There is sufficient statistical evidence to state that **the CU BKR members' export to each**



**other on average is 37.60% less than they could do according to the predictions by the gravity model.**

Compared to the estimated of CUBKR2 dummy in the four models with the reduced specification (Eq.1-4), it should be mentioned that the dummy had consistently negative estimates which in two cases were not significant.

Kurmanalieva *et al.* (2011) obtained positive but not significant estimates (0.68 and 0.31) for the dummy EURASEC-3 which represented the trade flows of the Customs Union between Belarus, Kazakhstan and Russia. It is quite questionable whether this result reflects the Customs Union effect on the trade flows between its members as the EURASEC-3 dummy was coded as one for the whole period of the investigated period (1995-2008). The result of Kurmanalieva is in line with the dummy BKR2 in the present study, which is also positive but not significant (0.215). The BKR2 dummy represents the export flows between Belarus, Kazakhstan and Russia in the period 1992-2009 – the period when the CU was not yet operational.

#### Hypothesis #7: exports from CU BKR to CIS

The level of exports from the CU BKR members to the remaining CIS countries has been analysed by means of a dummy CUBKR\_CIS. The value of the estimated coefficient is -0.069 which is not significant with a p-value of  $0.473 > 0.05$ . This result does not allow the rejection of the  $H_0$  that the exports from the CU BKR members are in line with the normal level predicted by the gravity model. Therefore there is sufficient statistical evidence to conclude that **the exports from the CU members (Belarus, Kazakhstan and Russia) to the remaining CIS countries in the investigated period are in line with the gravity model predictions.** So far no trade diversion effects have been detected.

The coefficient of the dummy in the prior models (Eq.1-4) is negative and significant in models with country and time FE; positive and not significant in country pair and time FE models. This implies that the coefficient of the CUBKR\_CIS dummy is not robust.

#### Hypothesis #8 exports from CIS to CU BKR

The level of exports coming from the CIS countries outside the CU BKR to the CU BKR has been analysed by means of the CIS\_CUBKR dummy. The estimated coefficient has a negative value of -0.642 and is significant at any conventional significance level. This leads to the rejection of the  $H_0$  that the level of exports from the CIS countries to the CU BKR members is in line with the normal level predicted by the gravity model. **On average the CIS countries outside the CUBKR were found to export 47.39% less to the CU members.**

Comparison of the signs and significance of the CIS\_CUBKR dummy in the reduced specification models (Eq.1-4) allows saying that the estimate is robust: the sign is consistently negative and coefficient is significant in all cases.

The obtained results regarding the Customs Union estimates should be treated with caution as the analysed time period for the CU membership is quite limited (2007-2010). It is not ruled out that within a couple of years the effect of the CU formation on the intra-CU exports may become positive and statistically significant.

Besides, Russia’s commitment to lower its applied tariff to 7.8% by the time it becomes a full WTO member, will have a positive influence on lowering the current 10.6% CET for the Customs Union of Belarus, Kazakhstan and Russia since the Russian applied tariff rates were leading for the setting of the CET. Bearing this in mind, the export flows from the CIS countries outside the CU BKR are expected to become more in line with the pre-CU period when the simple average applied tariff by the current CU members was 6%.

If a new CIS country chooses to join the CU, this may change the dynamics of intra-CU exports and exports to the remaining CIS outside the CU due to a different export structure of that particular country.

In summary, it is very much desirable to investigate a longer span of time of the CU being operational in order to check the robustness of these preliminary results.

### 5.3 General overview of the estimated effects from the trade policy options

The effects from trade policy options the CIS countries may follow, are represented in table 5.1. The total effect from some of the trade policies on the CIS exports is calculated in two steps: by adding the effect of membership on exports of the participating countries in a certain organisation/union and deducting the effect on exports that a CIS country experiences being outside the particular organisation/union in question.

Table 5.1: Trade policy options and their average effect on exports for the CIS countries in %

Trade policy option	+	-	The average effect on exports in %
FTA with the EU	FTA 8.36		8.36
Membership in the EU	EU2 25.66	CISEU -37.82	63.48
Membership in the WTO	WTO2 12.58	CISnonWTO_WTO -10.16	22.74
Membership in the CU BKR	CUBKR2 -37.6	CIS_CUBKR -47.39	9.79

Although membership of the EU will probably stay out of reach for all of the CIS countries for the coming decennia, for comparison reasons the membership is estimated to increase the exports by 63.48%.

Among the realistic trade policy options, the WTO membership was estimated to be the most favourable for the export increase of the CIS countries. Gains in terms of export from the conclusion of a FTA with the EU and membership of the CU BKR are quite comparable, but these two options are mutually exclusive.

It should be noted that the estimated 37.82% of the missing exports from the CIS to the EU was left out of the calculation of the FTA effect as realisation of these estimated missing exports will depend on the exact scope of the FTA. It is not ruled out that conclusion of a FTA with the EU can lead to

mitigation of the negative effect of CISEU to a certain degree. In this case conclusion of the FTA with the EU can lead to a larger boost of exports compared to that of the membership of the CU BKR.

## 6. Numerical non-linear simulations

A simulation based technique has been applied to estimate the effects of a number of assumptions accompanying the policy options for each of the CIS countries. The advantage of application of a simulation technique lies in the possibility to define the effect of any change in a variable of interest. Contrary to this, the use of dummies limits the estimation possibility of an effect to either being present (when dummy equals 1) or absent (when dummy equals zero). Therefore the use of the simulation technique is very useful for the quantification of the effects due to the changes in variables which can take any value.

The simulations in this study were applied for defining the benefits each CIS country may obtain in terms of export when its governance and infrastructure indicators reach the level of the EU15.

Referring to the 2010 summer proposal of a Russian tycoon, Mr. Prokhorov<sup>43</sup>, to dump the rouble for the euro, the simulation technique was applied to investigate the impact of this proposal on Russia's export.

The simulation technique consisted of three steps:

- 1) The estimated model 5 was solved to obtain the value of exports for each CIS country in question in 2010. This value of exports served as the base scenario.
- 2) The counterfactual scenario in terms of value of exports for each CIS country was computed based on the assumptions accompanying the policy option.
- 3) Calculation of the percentage difference between the counterfactual and base scenario value of exports for each CIS country. This percentage indicated the impact of the investigated assumptions.

Implementation of the simulation involved changing the original data for the year of 2010 as required by the assumptions coming alongside with the policy options. The assumptions of each simulation and obtained results will be discussed under separate headings.

### 6.1 A CIS country develops its infrastructure to the average level of the EU15

In this case the score of the Infrastructure variable of the CIS country in question was changed into the average score of Infrastructure variable of the EU15.

The estimated benefit in percents of extra export from the infrastructure improvement for each CIS country is presented in table 6.1. The CIS countries were sorted ascending according to the estimated benefit in terms of extra export. The highlighted country names represent the countries which are land-locked.

The highest benefit from the infrastructure improvement is calculated to be for Tajikistan which means a 41.92% increase of exports to the countries in the analysed sample. Kazakhstan was

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<sup>43</sup> See the article "Filling a summer lull in Russian politics", *International Herald Tribune*, 12-08-2011, p 5.

estimated to benefit the least from the infrastructure improvement by only a 25.16% of its export increase, which is still a considerable value.

Table 6.1 Infrastructure benefit for the CIS countries in % of extra export

Country	Original value of Infrastructure	The EU 15 value of Infrastructure	% Change in value of Infrastructure	Infrastructure benefit in % of extra export	Total export, million USD, in 2010
Kazakhstan	2.66	3.84	44.36	25.16	47,584
Belarus	2.63	3.84	46.01	25.88	25,214
Uzbekistan	2.54	3.84	51.18	28.06	5,826
Ukraine	2.44	3.84	57.38	30.52	51,431
Russia	2.38	3.84	61.34	32.02	373,692
Armenia	2.32	3.84	65.52	33.54	1,041
Turkmenistan	2.24	3.84	71.43	33.59	3,367
Azerbaijan	2.23	3.84	72.20	35.85	21,360
Georgia	2.17	3.84	76.96	37.41	1,575
Kyrgyzstan	2.09	3.84	83.73	39.52	1,101
Moldova	2.05	3.84	87.32	40.59	1,541
Tajikistan	2.00	3.84	92.00	41.94	1,195

The land-locked countries do not seem to benefit significantly more from the infrastructure improvement as the values of benefit from infrastructure improvement are evenly represented in lower, middle and higher part of the distribution. At the same time the countries with the smallest exports (Tajikistan, Moldova, Kyrgyzstan and Georgia) were estimated to benefit more from the infrastructure improvement.

Babecka-Kucharcukova *et al.* (2010) simulated the benefit from the infrastructure improvement to the level of the EU15 for the CIS countries: the highest trade gains were 13% for Moldova and the lowest for Turkmenistan with negative -0.9%. The substantive differences with the current study can be attributed to the different variable used for measurement of the infrastructure development. In the study by Babecka-Kucharcukova density of road and railroads was used while the present study used the Logistics Performance Index (LPI) which is believed to better reflect the level of infrastructure development as it measures the quality of trade and transport related infrastructure.

The LPI data was used in the simulation made by Felipe *et al.* (2010) to estimate the benefits for the Central Asian countries from the improved infrastructure. The used LPI score in the simulation was defined in a different way compared to the present study (the simulation score was different for each country and depended on the gap between the current LPI score and the average LPI score of the countries in the sample). Nevertheless, the highest impact on total exports was estimated to be for Tajikistan with 105% increase and the lowest for Azerbaijan with 54%.

Although the estimated benefits from the infrastructure improvement differ greatly when compared to results in other studies, it is remarkable that Tajikistan and Moldova – the two countries which benefit most in the present study – also were leading in the largest possible benefit in the above mentioned studies.

## 6.2 A CIS country improves the quality of governance to the average level of the EU15

As the governance variable is a composite of the six indicators, the impact of each of the improved indicators was computed separately. One by one each of the six indicators was changed to the level of the EU15 for a CIS country in question, while the remaining five indicators stayed unchanged. Thus the governance variable for 2010 was calculated every time using the same formula of the simple

average of the six indicators where only one indicator was changed to the level of the EU15. This allowed estimation of the separate impact of each governance indicator for each of the twelve countries. The results are presented in table 6.2 where the countries were sorted ascending according to the estimated total benefit from the improved governance. The highlighted cells in each column mark the highest estimated benefit a country can achieve in case of governance improvement<sup>44</sup>.

Table 6.2: Governance benefit for the CIS countries in % of extra export

Country	Control of Corruption	Rule of Law	Regulatory Quality	Voice and Accountability	Government Effectiveness	Political Stability & Absence of Violence	Total benefit in % of extra export	Original value of Governance
Georgia	12.45	13.03	6.37	11.35	8.92	10.92	63.04	-0.06
Armenia	15.99	14.57	8.15	16.66	10.66	4.96	70.99	-0.22
Moldova	17.16	14.58	11.78	10.53	16.33	8.84	79.22	-0.39
Kazakhstan	19.42	16.41	13.44	19.35	13.45	2.20	84.27	-0.48
Ukraine	19.19	17.95	15.30	11.15	17.55	6.42	87.55	-0.56
Russia	20.07	17.78	14.02	17.67	14.39	12.56	96.49	-0.75
Azerbaijan	20.92	18.62	14.43	20.46	18.09	7.99	100.51	-0.86
Kyrgyzstan	20.07	22.14	12.83	17.77	16.35	13.12	102.28	-0.82
Belarus	17.90	20.01	20.49	22.91	20.59	6.48	108.37	-0.97
Tajikistan	20.92	21.31	19.58	21.18	18.66	12.76	114.41	-1.10
Uzbekistan	22.17	22.85	24.20	27.06	17.74	11.68	125.69	-1.31
Turkmenistan	23.22	23.57	28.58	27.16	24.49	3.82	130.84	-1.39

Notes: Total benefit from governance improvement is calculated as the sum of separate benefits from each of the six indicators; Original value of governance represents the simple average of the scores of six indicators in 2010.

The magnitude of the estimated benefit for each country shows the correspondence to the initial gap in the governance value compared to the average EU 15 value: the lower the initial governance value of the CIS country the higher the estimated benefit is. Although all of the countries still have a way to go in the process of governance improvement, based on this estimation, there are vivid leaders (Georgia, Armenia and Moldova) and laggards (Uzbekistan and Turkmenistan) in the already achieved progress.

Based on these estimates, the individual contribution to the total increase of exports from improvement of governance indicators is the highest for control of corruption which for the CIS countries leads on average to an increase of 19.12% of exports, followed by the rule of law and voice & accountability which contribute to an 18.60% increase each. Improved government effectiveness leads to an export increase by 16.43%, regulatory quality by 15.77%. The lowest effect of an 8.48% increase of exports comes from improvement of political stability and absence of violence.

A recent study by Babecka-Kucharcukova *et al.* (2010) simulated possible benefits from the institutional improvement for the selected CIS countries to the level of the EU15. Their estimates were based on three indicators: rule of law, control of corruption and regulation quality. Although the simulation excluded Russia, Georgia and Armenia, the average benefit in terms of extra export for the remaining CIS countries was estimated to be 205% (based on the scores for indicators in 2008). Roughly taken, the scale of estimated benefit is 3.5 times higher than estimates in the present study. The ranking of the countries in terms of the largest possible benefit coincides with the ranking of the present study: Turkmenistan was leading with 322% gain of extra export and Moldova was the lowest with an estimated gain of 161%. Only Ukraine was estimated to benefit less than Kazakhstan (178% compared to 193%), which placed Ukraine before Kazakhstan on the list of ascending estimated benefit.

<sup>44</sup> Calculation of the possible benefit from improvement of each of the six indicators is given in table 9.11 in the appendix.

Differences in the estimated benefit can be due to the different years used in the simulation scenario for the simulation (this present study used the scores of 2010 while Babecka-Kucharcukova used 2008) as well as to differences in dataset and estimation techniques.

The estimates of the trade potential with the EU for the four CIS countries (Russia, Belarus, Ukraine and Kazakhstan) were much lower in the study by Koukhartchouk *et al.* (2003). The improved quality of institutions<sup>45</sup> of the four CIS countries to the level of the EU15 was estimated to increase trade of Belarus and Kazakhstan with the EU by 144% and of Russia and Ukraine by 103%.

Fuchs *et al.* (2008) estimated that the exports from the EU new members (which joined in 2004 and 2007) to the old members of the EU, would increase by 17.9% if the institutional framework<sup>46</sup> of the new members would reach the level of the EU15. The fight against corruption was identified to be the most important factor which contributed to the increase of exports. In the present study control of corruption was also found to be the highest contributor to the total export increase, but its contribution is quite close to that of rule of law and voice & accountability.

All in all the impact on the CIS exports from the improvement of the governance quality is huge.

### 6.3 Russia pegs its rouble to the euro

Referring to the suggestion made by Mr. Prokhorov to dump the Russian rouble and introduce the euro as Russian currency, a simulation has been run to estimate the consequences of this plan for the Russian exports.

Technically, introduction of the euro as domestic currency means that a country obtains the membership of the European Monetary Union (EMU). Membership of the EMU implies that a future member country loses independence over its monetary policy. In order to become a candidate for EMU membership the so-called Maastricht criteria should be met. Table 6.3 shows that Russia does not meet all the criteria, though it satisfies one of them as government debt was only 9.9% of the GDP in 2010.

Table 6.3: Maastricht criteria for the EMU membership

Maastricht Requirements	Criteria	Russia
Inflation $\leq 1.5\%$ points above the average of the average of the 3 countries with the lowest rate	3.2	6.9
Nominal long-term interest rate $\leq$ by 2% points above average of the 3 countries with the lowest rate	5.5	7.7
ERM II participation	yes	no
Budget deficit to GDP $\leq 3\%$	$\leq 3$	-3.9
Government debt to GDP $\leq 60\%$	$\leq 60$	9.9

Sources:  
Eurostat yearbook 2011: Europe in Figures; Information on Russia: World Bank database, IMF database, Federal State Statistics Service of Russia, <http://www.economywatch.com>.

<sup>45</sup> The institutions were represented by five separate indicators: trade policy, bank finance, wage prices, property rights and black market.

<sup>46</sup> The institutions were represented by indicators from the Index of Economic Freedom: business freedom, trade freedom, fiscal freedom, government size, monetary freedom, investment freedom, financial freedom, property rights, freedom from corruption.

With this in mind, the only way Russia can manoeuvre in order to approximate the suggestion of Mr. Prokhorov is to change its current managed float exchange regime<sup>47</sup> to a fixed peg exchange rate regime. In this case the Rouble is fixed within a margin to the Euro at a central parity rate. This would have the following consequences for the exchange rate and volatility: the parity rate of the Rouble to the Euro should be set at which the bilateral exchange rate would become zero; the volatility of the bilateral exchange rate with the EMU countries would equal zero; the volatility with third countries outside the EMU would equal that of the euro countries.

In 2010 the annual exchange rate was 40.27 Roubles per one Euro. In the simulation the parity exchange rate for the year 2010 was set to 40.58 Roubles per Euro, which was based on the average of the monthly exchange rate in the period of 2009-2010.

Setting volatility with the euro countries to zero was problematic as volatility enters the regression in the form of a natural log which is not defined for the zero. Therefore the impact of zero volatility with the euro countries in 2010 was estimated by bringing the coefficient of the  $TB_{ij} * \ln Vol_{ij}$  to zero.

Finally the volatility with the non-euro countries was replaced by that of the euro for 2010. The impact of the three changes is represented in table 6.4.

Table 6.4: The effect from adoption of the euro as Russian currency on Russian export in %

	Volatility with EMU=0	Volatility with 3d countries = volatility of euro	Changes in exchange rate	Total
Russia	-2.99	0.17	0.42	-2.40

The zero volatility with the EMU countries has a negative impact on Russian exports.

Under the base scenario the impact of volatility with the EMU countries on Russian exports in 2010 was estimated as  $\sum \text{coefficient} (-0.00296) * TB_{ij} * \ln Vol_{ij}$  which resulted in a positive figure of 0.0295. Taking the entire log of 0.0295, the contribution of the volatility with the EMU countries to Russian exports was estimated to be 1.0299.

Under the simulation scenario the contribution of the zero volatility of exchange rate with the EMU countries equals one. Setting the regression coefficient -0.00296 to zero leads to the whole sum  $\sum \text{coefficient} (0) * TB_{ij} * \ln Vol_{ij}$  becoming zero, which in its turn results in  $e^0=1$ .

The percentage difference between the simulation scenario with the volatility being zero and the base scenario with the original volatility is calculated as  $(e^0 - e^{0.0295}) * 100\% = (1 - 1.0299) * 100\% = -2.99\%$ .

The calculation is similar to the common approximation of the dummy effect, which is calculated as  $(e^{\text{coefficient (when Dummy=1)}} - e^{\text{coefficient (when Dummy=0)}}) * 100\%$ . In the present situation, the calculation of the zero volatility effect is based on comparison to the original volatility effect which explains the reversed sequence in the term  $(e^0 - e^{0.0295})$ .

The negative impact of zero volatility with the EMU countries on the Russian exports may seem contradicting, but one should not forget that the sign of the total contribution of the volatility term depends on the sign of the regression coefficient, the sign of Russia's trade balance with each EMU

<sup>47</sup> According to the latest IMF's *De facto* classification of exchange rate regimes based on the data for 2006.

country and the sign of the natural log of the volatility of the bilateral exchange rate. Knowing that in 2010 Russia had a positive trade balance with 11 out of 16 EMU countries, one can realise that the sign of the total contribution of the volatility term is determined by the sign of the trade balance since the product of (coefficient\*LnVol<sub>ij</sub>) gives a positive value as both the regression coefficient and natural log of volatility are negative.

In case the volatility of the Russian exchange rate with the non-EMU countries equals the values of a volatility of the euro with those countries, Russia's exports were estimated to increase by 0.17%. Changes in the exchange rate were estimated to generate an extra 0.42% of exports for Russia which in fact coincide with the positive effect of home currency depreciation on the exports.

Altogether the effect from fixing the Rouble exchange rate to the Euro is negative – it leads to a 2.40% decrease in Russia's exports.

Even if the suggestion of Mr. Prokhorov was a pure trick to draw attention to his candidature in the upcoming presidential campaign, he is lucky, as the economic consequence of his proposal obtained in this study will never reach the regular Russian voter.

## 7. Conclusions

This study investigated the impact on the exports of the CIS countries from the three trade policy options the CIS countries can pursue: obtaining the WTO membership; concluding an FTA with the EU and joining the customs union of Belarus, Kazakhstan and Russia. Next to this, simulations were made to estimate the impact of infrastructure and governance improvement on the exports of the CIS countries.

The effect of the three trade policy options was measured in the broader context of the exports flows from and to the CIS countries which allowed identifying the export asymmetries regarding the CIS countries.

The CIS countries were found to over-export to each other by 70.80%, while exports to the more developed EU countries were below the predictions of the gravity model by 37.82%. The non-membership of the WTO led to reduction of the exports of the CIS countries to the WTO members by 10.16%.

On the other hand, the exports from the EU countries were found to be 8.27% below the normal level predicted by the gravity model. The exports from the WTO members to the CIS non-WTO members were in line with the gravity model predictions.

The total effect of membership of the WTO for the CIS countries, which are currently outside the WTO organisation, was estimated to be a 22.74% export increase. This effect is comparable with the results obtained in earlier studies (see Subramanian *et al.* (2003), Chang *et al.* (2007), Kurmanalieva *et al.* (2011)). Among the three investigated trade policy options, the WTO membership was estimated to have the largest impact on the exports of the CIS countries which are currently non-members.



Conclusion of an FTA with the EU was estimated to boost the exports by 8.36%. The result is a bit smaller than the findings of earlier studies (Maliszewska, (2008) – a 13.5% increase of exports; Caporale et al. (2008) - a 14% increase in trade).

The effect of membership of the customs union of Belarus, Kazakhstan and Russia was estimated to be negative, lowering the exports between the members by 37.60%. The negative impact of such magnitude is quite puzzling. Exports from the remaining CIS countries to the CU BKR were 47.39% below the expected level based on the gravity model. Exports of the CU members to the remaining CIS countries were in line with the gravity model. The total combined effect for the CIS countries wanting to join the CU BKR was estimated to be a 9.79% export increase.

The results regarding the effect of the CU BKR and the export flows to and from the remaining CIS countries are preliminary as the analysed period was limited to four years. Further extension of the period is advisable to check the robustness of the obtained results.

The simulation results showed that the largest boost to the exports of the CIS countries can be achieved through further improvement of governance and development of the infrastructure. On average, improvement of governance quality in the CIS countries to the level of the EU15 would give a 97% increase of the CIS exports. Improvement of the infrastructure to the level of the EU15 would lead on average to a 34% increase of the CIS exports. The estimations of the potential export increase due to improved governance and infrastructure are larger than any of the effects from the three trade policy options.

The above mentioned findings are presented in table 7.1, which also summarises the progress of the CIS countries in the pursuit of the defined trade policy options.

Table 7.1: Benefits in terms of % extra exports for the CIS countries from trade policy options

Country	Governance benefit	Infrastructure benefit	Benefit from WTO membership	CU BKR membership	Benefit from CU BKR membership	Negotiations FTA with EU	Benefit from FTA with EU
Armenia	70.99	33.54	member			ongoing	8.36
Azerbaijan	100.51	35.85	22.74			ongoing	8.36
Belarus	108.37	25.88	22.74	-37.60			
Georgia	63.04	37.41	member			ongoing	8.36
Kazakhstan	84.27	25.16	22.74	-37.60			
Kyrgyzstan	102.28	39.52	member	considering	9,79		
Moldova	79.22	40.59	member			ongoing	8.36
Russia	96.49	32.02	22.74	-37.60			
Tajikistan	114.41	41.94	22.74	considering	9,79		
Turkmenistan	130.84	35.59	22.74				
Ukraine	87.55	30.52	member			ongoing	8.36
Uzbekistan	125.69	28.06	22.74				

Note: Russia is expected to become a full-fledged WTO member by summer 2012

Based on these findings the following policy recommendations can be made.

The highest priority for the CIS countries lies in the improvement of their governance quality and further institutional development. Among the three main areas which measure the quality of governance, reinforcement of respect for institutions which govern economic and social interactions among citizens and the state, that is, the rule of law and control of corruption, should be given an absolute priority. More effort should be put into further development of democratic values and

improvement of governmental capacities to define sound policies which will contribute to better export performance of each of the CIS countries.

Development of infrastructure is the second vital factor for the enhancement of the CIS exports. The CIS countries should modernise the existing infrastructure as well as develop new infrastructure projects which would contribute to a better access to their main export destinations.

Although development of governance quality and infrastructure are subject to solely national policies of every CIS country, together they have the potential to generate an overwhelming boost to exports of every CIS country.

As far as it concerns the international trade policies of the CIS countries, a certain pattern has already been formed which roughly divides the CIS countries into three groups: countries which favour the European integration, countries which favour regional integration with Russia as a main driving force, and the remaining group of countries which did not formulate their preferences yet.

Regardless of which integration direction the CIS countries choose to follow, for the CIS countries which are still outsiders, the WTO membership is seen as the first objective to strive for. Membership of the WTO does not only lead to a greater access to the global markets, it carries the message of credibility to the whole world and puts the new member on equal footing with the current members.

Probably Russia's membership of the WTO will serve as a catalyst for Belarus and Kazakhstan to join the WTO, as Russia's WTO commitments will indirectly affect these countries through their membership in the customs union with Russia. Furthermore, Russia's WTO membership is expected to have positive influence on the trade policies in the CIS region.

The remaining outsiders – Azerbaijan, Tajikistan, and Uzbekistan – are advised to speed up the accession process, while Turkmenistan should seriously consider application to the WTO. Tajikistan, Turkmenistan and Uzbekistan have the lowest quality of governance in the whole group of CIS countries. The accession process to the WTO could offer guidance in the required institutional reforms and trade policies. Eventually the WTO membership can improve the export performance of Turkmenistan and Uzbekistan, lifting them out of the group of least exporting countries of the CIS.

Second in priority of the CIS international trade policy options is the choice for the direction of integration. Generally, integration projects exert positive impact on the export performance of its members, but the question which path to follow (eastwards or westwards) remains very much politically charged in the CIS countries.

Russia has the aspirations to become the centre of regional integration for the CIS countries and creation of the Customs Union is a clear step in realisation of this goal. Although Russia has tight trade relations with the EU and their bilateral cooperation was given extra depth by establishment of the Common Economic Space in 2003 and the Partnership for Modernisation in 2010, in the context of the post-Soviet space, Russia competes with the EU for the spheres of influence when it concerns the CIS countries.

Judging from the Ukrainian experience over the last two years, participation in both the customs union of Belarus, Kazakhstan and Russia and conclusion of the FTA with the EU appear to be mutually exclusive.

For the CIS countries without an outspoken preference for integration in any of the directions – Kirgizstan, Tajikistan, Turkmenistan and Uzbekistan – the choice will have to be made one day. Based on the preliminary results, both options (CU BKR membership and FTA with the EU) are expected to generate a comparable increase in exports. However, it would be wise to verify the robustness of the preliminary results regarding the benefits from the CU BKR membership by extending the analysed period of the present study with the 2011 data, before making a grounded choice for the direction of integration for these countries. Besides the outlined directions of integration, these Central Asian countries can investigate the potential for intensification of the trade relations with China which becomes more powerful on the global trade arena.

The positive impact of exports from the FTA with the EU makes it logical for remaining CIS countries, which are in the process of the DFTA negotiations, to put their efforts into successful conclusion of the agreements with the EU. Furthermore, conclusion of the DFTA is assumed to positively influence development of governance quality in the CIS countries as DFTA requires approximation of the EU standards in legislative as well as trade related areas.

For Belorussia and Kazakhstan, the negative effect of the participation in the Customs Union needs to be further investigated. Extending the analysed period could shed more light on the robustness of the obtained result. In case that the negative effect persists, the countries will be probably “stuck” with Russia which is not expected to give up its customs union project any soon.

As for Russia, joining the WTO in summer 2012 is a very positive step which testifies Russia’s commitment to respect the conduct of international trade. The WTO membership opens up the possibility to intensify the economic cooperation with the EU either in a form of the existing agreements or in the form of an FTA. The latter is expected to positively influence Russia’s exports. However, further development of cooperation with the EU will very much depend on the internal course of the Russian politics as well as Russia’s position in the international politics.

The possibility to lead the regional integration of the CIS countries will very much depend on the economic benefits from the membership of the customs union.

In summary, the highest priority for any of the CIS countries lies in the improvement of governance and institutional development which should form a strong base for further development of their economies. Although improvement of governance quality in the CIS countries is a challenging process that could take some time, it is definitely the job worth doing.

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## **Reports, databases and websites**

Article "Filling a summer lull in Russian politics", International Herald Tribune, the 12th of August 2011, p 5.

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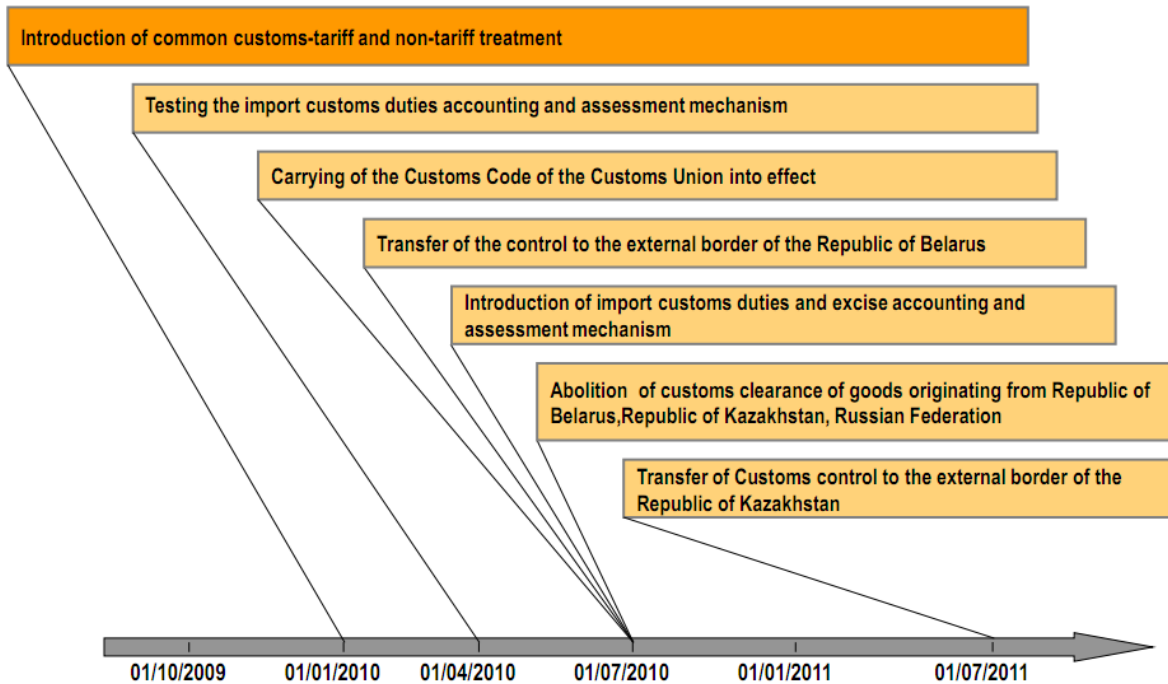
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## 9. Appendix

Figure 9.1: Formation process of the Customs Union between Belarus, Kazakhstan and Russia



Source: the official site of Customs Union, retrieved on 30-11-11, available at: [http://www.tsouz.ru/news/Documents/Custom\\_Union\\_Glaziev1.pdf](http://www.tsouz.ru/news/Documents/Custom_Union_Glaziev1.pdf)

Table 9.1: Overview of the Bilateral and Regional Trade Agreements between the CIS countries

	ARM	AZE	BLR	GEO	KAZ	KGZ	MDA	RUS	TJK	TKM	UKR	UZB
ARM												
AZE												
BLR												
GEO	1998	1996										
KAZ	2001		1997 EAEC 2004 CEZ FTA*	1999								
KGZ	1995		1997 EAEC		1992 ECO 1995 1997 EAEC							
MDA	1995					1996						
RUS	1993		1997 EAEC 2004 CEZ FTA*	1994	1997 EAEC 2004 CEZ FTA*	1993 1997 EAEC						
TJK			1997 EAEC		1992 ECO	1992 ECO						
TKM	1996			2000	1992 ECO	1992 ECO			1992 ECO			
UKR	1996	1996	2004 CEZ 2006	1996	1998 2004 CEZ	1998	1996 2005	1994 2004 CEZ	2002	1995		
UZB					1992 ECO	1992 ECO 1998			1992 ECO	1992 ECO	1996	

Notes: The year indicates the bilateral FTA in goods coming into force  
 CEZ = Common Economic Zone, FTA in goods  
 EAEC= Eurasian Economic Community, Customs Union with coverage in goods  
 FTA\* = Free Trade Area - under negotiations  
 ECO = Economic Cooperation Organisation, partial scope agreement in goods. The participating non-CIS countries: Afghanistan, Iran, Pakistan, Turkey.  
 Source: WTO, RTA database

Figure 9.2: Industry, value added of the CIS countries (in billion constant 2000 USD), in 1992-2009.

This graph illustrates the development of the industry sector of the CIS countries. The square on each country line indicates the year when the industry value added surpassed the level of the 1992.

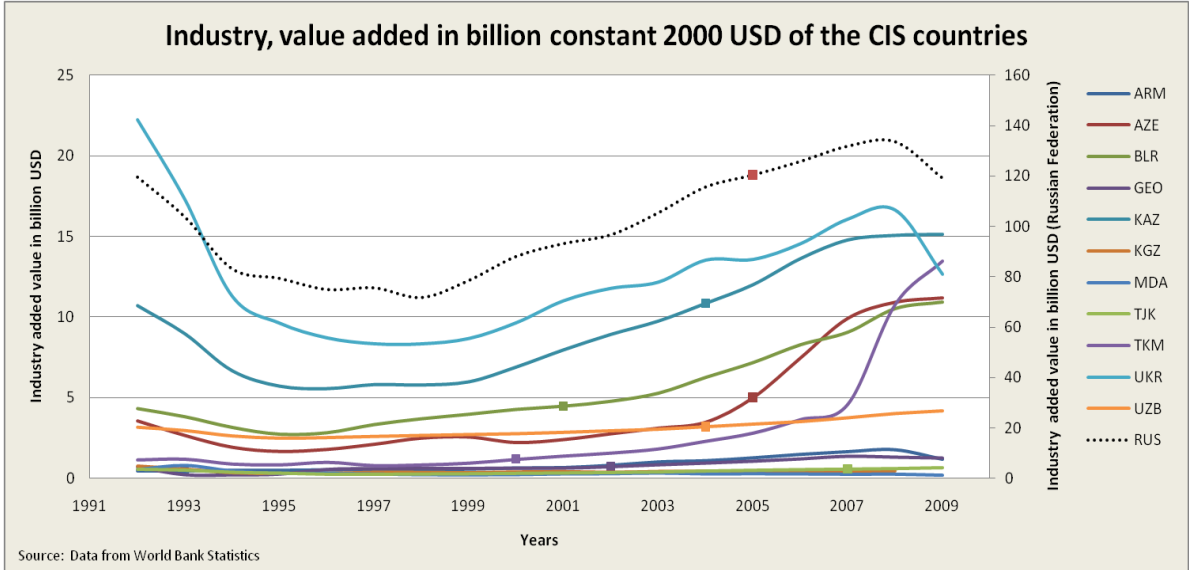


Figure 9.3: Destination of the EU exports in percents during the period 1992-2010

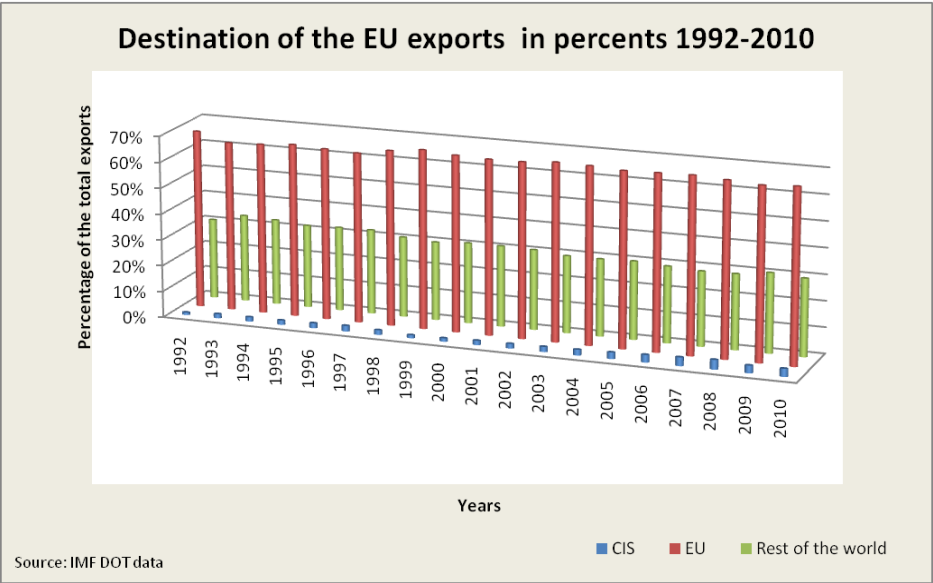


Table 9.2: The overview of the WTO membership of the CIS countries

Country	WTO member since	Applied in
ARM	2003	1993
AZE	na	1997
BLR	na	1993
GEO	2000	1996
KAZ	na	1996
KGZ	1998	1996
MDA	2001	1993
RUS	2012*	1993
TJK	na	2001
TKM	na	na
UKR	2008	1993
UZB	na	1994

Source: the WTO site

Note: Russia is expected to become a member by summer 2012

Table 9.3: The overview of the top ten export destinations of the members of CU BKR

### Belarus

**Table 4: Exports by principal countries and SITC sections in 2010**  
(Value in million US\$, percentages of country total)

Country	Total	Shares by SITC sections (%)									Total
		0+1	2+4	3	5	6	7	8	9		
World.....	25225.9	12.4	2.7	28.1	14.8	15.0	17.2	6.3	3.5	100	
Russian Federation.....	9702.4	26.9	1.9	0.5	5.9	20.3	30.0	11.4	3.0	100	
Netherlands.....	2773.1	0.1	0.4	97.7	0.1	1.3	0.1	0.4	...	100	
Ukraine.....	2560.0	4.4	1.1	61.1	6.9	10.7	13.0	2.8	...	100	
United Kingdom.....	984.0	0.0	0.3	97.2	0.0	1.3	0.1	1.1	...	100	
Latvia.....	930.6	0.8	3.8	61.4	19.4	12.1	1.4	1.1	...	100	
Poland.....	885.5	0.9	12.0	36.7	24.9	14.4	9.7	1.3	...	100	
Brazil.....	705.5	0.0	0.0	...	96.9	3.1	...	0.0	...	100	
Areas, nes.....	599.9	1.1	0.0	...	0.3	0.0	0.0	0.0	98.6	100	
China.....	469.4	0.0	4.1	4.7	75.1	1.3	10.4	4.4	...	100	
Kazakhstan.....	462.7	26.7	0.8	0.0	6.6	21.9	31.9	11.6	0.4	100	

### The SITC codes:

0 – Food and live animals

1 – Beverages and tobacco

2 – Crude materials, inedible, except fuels

3 – Mineral fuels, lubricants and related materials

4 – Animal and vegetable oils, fats and waxes

5 – Chemicals and related products

6 – Manufactured goods classified chiefly by material

7 – Machinery and transport equipment

8 – Miscellaneous manufactured articles

9 – Commodities and transactions not classified elsewhere in the SITC

Source: <http://unstats.un.org>

### Kazakhstan

**Table 4: Exports by principal countries and SITC sections in 2010**  
(Value in million US\$, percentages of country total)

Country	Total	Shares by SITC sections (%)									Total
		0+1	2+4	3	5	6	7	8	9		
World.....	57244.1	3.3	5.5	71.7	4.4	13.0	0.6	0.1	1.5	100	
China.....	10122.1	0.1	14.3	54.7	9.5	21.4	0.0	0.0	0.0	100	
Italy.....	9576.8	0.1	0.1	97.3	0.0	2.0	0.1	0.0	0.4	100	
France.....	4433.1	0.1	0.0	93.4	6.4	0.0	0.1	0.0	...	100	
Netherlands.....	4161.0	0.1	0.2	96.5	0.2	2.8	0.2	0.0	0.0	100	
Russian Federation.....	3006.5	1.8	38.5	28.3	8.6	19.9	2.8	0.2	0.0	100	
Austria.....	2528.7	0.0	0.0	99.8	0.0	0.2	0.0	0.0	...	100	
Canada.....	2439.1	0.1	0.0	87.8	12.1	0.0	0.0	0.0	...	100	
Germany.....	1749.7	2.6	2.0	55.8	3.3	35.9	0.2	0.1	0.2	100	
United Kingdom.....	1379.5	0.7	0.7	48.0	1.0	48.6	0.6	0.3	0.0	100	
Romania.....	1281.9	0.0	0.0	99.2	0.5	0.2	0.0	0.0	0.0	100	

### Russia

**Table 4: Exports by principal countries and SITC sections in 2010**  
(Value in million US\$, percentages of country total)

Country	Total	Shares by SITC sections (%)									Total
		0+1	2+4	3	5	6	7	8	9		
World.....	373055.6	2.0	3.6	69.1	4.4	12.3	3.2	0.7	4.9	100	
Netherlands.....	53212.7	0.3	0.8	85.4	0.4	12.9	0.1	0.0	0.0	100	
Areas, nes.....	49819.9	0.0	0.0	87.4	0.0	0.0	0.0	0.0	12.6	100	
Italy.....	24303.4	0.3	1.1	83.6	2.0	12.6	0.2	0.1	0.0	100	
China.....	19781.2	4.8	20.9	51.9	10.7	4.0	5.1	0.5	2.0	100	
Germany.....	15860.0	0.6	2.2	70.0	2.3	16.7	3.4	1.3	3.5	100	
Poland.....	14215.9	0.1	2.7	90.3	3.1	3.1	0.6	0.1	0.0	100	
Turkey.....	14007.8	2.9	5.6	60.4	5.3	24.6	0.7	0.2	0.2	100	
Ukraine.....	13603.2	4.2	2.8	43.2	12.0	16.6	16.8	2.1	2.3	100	
Japan.....	12501.0	1.7	2.9	83.8	0.4	9.0	1.8	0.1	0.3	100	
USA.....	12032.7	0.5	1.6	49.8	6.2	27.0	1.6	0.7	12.6	100	

Source: UN Comtrade country profiles 2010

Table 9.5: The share of exported mineral fuels from the CU BRK members to the CIS countries as percentage of total exports in 2010

Year	Reporter	Partner	Export of mineral fuels in % of total exports
2010	BLR	ARM	0.07
2010	RUS	ARM	1.23
2010	BLR	AZE	0.47
2010	KAZ	AZE	0.00
2010	RUS	AZE	0.78
2010	BLR	GEO	10.03
2010	KAZ	GEO	1.62
2010	RUS	GEO	13.12
2010	BLR	KGZ	42.48
2010	KAZ	KGZ	31.32
2010	RUS	KGZ	57.55
2010	BLR	TJK	0.00
2010	KAZ	TJK	8.94
2010	RUS	TJK	49.12
2010	BLR	TKM	0.56
2010	KAZ	TKM	0.01
2010	RUS	TKM	0.37
2010	BLR	UKR	61.08
2010	KAZ	UKR	75.86
2010	RUS	UKR	25.45
2010	BLR	UZB	0.25
2010	KAZ	UZB	48.20
2010	RUS	UZB	2.96

Notes:

- 1) The trade flows for MDA are not available as well as trade flows between KAZ and ARM
  - 2) The data of GEO and TKM is given for comparison, these countries are not CIS members in 2010
- Source: UN Comtrade database, export of mineral fuels, code 3 according to SITC codes rev.3

Table 9.6: Definition of the variables

Group	Variable	Description	Formula	Source
	$\ln X_{ijt}$	Log of exports of country $i$ to country $j$ , f.o.b. value in million USD		IMF-DOT
	$\ln GDP_{it}$	Log of GDP of country $i$ , in current USD, in million USD		WDI
	$\ln GDP_{jt}$	Log of GDP of country $j$ , in current USD, in million USD		WDI
Geography related	$Contig_{ij}$	Dummy for common border	1 if countries $i$ and $j$ are contiguous; 0 otherwise	CEPII
	$Language_{ij}$	Dummy for common language	1 if common language is spoken at least by 9% of the population in countries $i$ and $j$ ; 0 otherwise	CEPII (variable: "comlang_etno")

Group	Variable	Description	Formula	Source
	InDistance	Log of distance between the capital cities between the exporting and importing countries in km		CEPII
Macro and micro indicators	InXrate <sub>ijt</sub>	Bilateral cross exchange rate: the natural log of the ratio of average annual nominal exchange rate of national currency versus USD of the exporting country / average annual nominal exchange rate of national currency versus USD of the importing country	$\ln(\text{national currency of country } i \text{ vs USD} / \text{national currency of country } j \text{ vs USD})$	IMF-IFS OECD (for the euro/USD rate for EMU countries) <a href="http://www.fxtop.com">www.fxtop.com</a> (for exchange rates of Turkmenistan and Uzbekistan)
	InVolatility <sub>ijt</sub>	Natural log of bilateral exchange rate volatility measured by a rolling coefficient of variation with the 12 month window using the exchange rate of nominal national currency vs USD rate, monthly period averages	$\ln(\text{Rolling CV} = \text{STDEV} / \text{Mean})$	Own calculations based on IMF-IFS exchange rate data; exchange rates of TKM and UZB are from <a href="http://www.fxtop.com">www.fxtop.com</a>
	TB <sub>ijt</sub>	Bilateral trade balance of the exporting country <i>i</i> and importing country <i>j</i>	$TB_{ijt} = \ln X_{ijt} - \ln M_{ijt}$	Own calculations <sup>1</sup> based on IMF-DOT data
	Inflation <sub>it</sub>	Inflation of country <i>i</i> measured by consumer price index in annual percentage change		WDI; CIA World Factbook for TKM and UZB
	Oil price <sub>t</sub>	Annual crude oil price per barrel in USD		IMF
Trade policy	Tariff <sub>jt</sub>	Tariff rate of country <i>j</i> , most favoured nation, weighted mean, all products %		WDI <sup>2</sup>
	FTA	Dummy for an FTA between country <i>i</i> and <i>j</i>	1 if countries <i>i</i> and <i>j</i> have an FTA; 0 otherwise	WTO RTA database <sup>3</sup>
	CIS2	Dummy for CIS membership (country <i>i</i> and <i>j</i> are both members)	1 if countries <i>i</i> and <i>j</i> belong to CIS; 0 otherwise	<a href="http://www.cisstat.com">www.cisstat.com</a>
	CISEU	Dummy for country <i>i</i> being a CIS member and country <i>j</i> an EU member	1 if country <i>i</i> is a CIS and country <i>j</i> is a EU member; 0 otherwise	<a href="http://www.cisstat.com">www.cisstat.com</a> <a href="http://www.europa.eu">www.europa.eu</a>
	EU2	Dummy for the EU membership (country <i>i</i> and <i>j</i>	1 if both countries <i>i</i> and <i>j</i> belong to EU;	<a href="http://www.europa.eu">www.europa.eu</a>

Group	Variable	Description	Formula	Source
		are both members)	0 otherwise	
	EUCIS	Dummy for country <i>i</i> being an EU member and country <i>j</i> a CIS member	1 if country <i>i</i> is a EU and country <i>j</i> is a CIS member; 0 otherwise	<a href="http://www.europa.eu">www.europa.eu</a> <a href="http://www.cisstat.com">www.cisstat.com</a>
	WTO2	Dummy for the WTO membership (country <i>i</i> and <i>j</i> are both members)	1 if both countries <i>i</i> and <i>j</i> belong to the WTO; 0 otherwise	<a href="http://www.wto.org">www.wto.org</a>
	CISnonwto_WTO	Dummy for country <i>i</i> being a CIS country which is not a WTO member and country <i>j</i> a WTO member	1 if country <i>i</i> is a CIS non-WTO member and country <i>j</i> is a WTO member; 0 otherwise	<a href="http://www.wto.org">www.wto.org</a> <a href="http://www.cisstat.com">www.cisstat.com</a>
	WTO_CISnonWTO	Dummy for country <i>i</i> being a WTO member and country <i>j</i> a CIS country which is not a WTO member	1 if country <i>i</i> is a WTO and country <i>j</i> is a CIS non-WTO member; 0 otherwise	<a href="http://www.wto.org">www.wto.org</a> <a href="http://www.cisstat.com">www.cisstat.com</a>
	CUBKR2 <sup>4</sup>	Dummy for the membership in Customs Union of Belarus, Kazakhstan and Russia (country <i>i</i> and <i>j</i> are both members)	1 if both countries <i>i</i> and <i>j</i> belong to the Customs Union BKR; 0 otherwise	<a href="http://www.tsouz.ru">www.tsouz.ru</a>
	CUBKR_CIS	Dummy for country <i>i</i> being a member of CU BKR and country <i>j</i> is a CIS member	1 if country <i>i</i> is a CU BKR member and country <i>j</i> is a CIS member; 0 otherwise	<a href="http://www.tsouz.ru">www.tsouz.ru</a>
	CIS_CUBKR	Dummy for country <i>i</i> being a CIS member and country <i>j</i> is a member of CU BKR	1 if country <i>i</i> is a CIS member and country <i>j</i> is a CU BKR member; 0 otherwise	<a href="http://www.tsouz.ru">www.tsouz.ru</a>
Governance indicators	Governance <sub>it</sub>	Simple average of governance score for country <i>i</i> based on: control of corruption, rule of law, regulatory quality, voice and accountability, government effectiveness, political stability and absence of violence	$Governance_{it} = (cor_{it} + law_{it} + reg_{it} + acc_{it} + gov_{it} + polstab_{it}) / 6$  ranges from (-2.5 to 2.5)	Own calculations based on WBI-WGI <sup>5</sup> (worldwide global indicators)
	Governance <sub>jt</sub>	Simple average of governance score for country <i>j</i> based on: control of corruption, rule of law, regulatory quality, voice and accountability, government effectiveness,	$Governance_{jt} = (cor_{jt} + law_{jt} + reg_{jt} + acc_{jt} + gov_{jt} + polstab_{jt}) / 6$  ranges from (-2.5 to 2.5)	Own calculations based on WBI-WGI <sup>5</sup> (worldwide governance indicators)



Group	Variable	Description	Formula	Source
		political stability and absence of violence		
Infrastructure	Infrastructure <sub>it</sub>	Logistics performance index: quality of trade and transport-related infrastructure; ranges from 1 = low to 5 =high	ranges from 1 = low to 5 =high	WDI (data available for 2006 and 2009) <sup>6</sup>
	Infrastructure <sub>jt</sub>	Logistics performance index: quality of trade and transport-related infrastructure; ranges from 1 = low to 5 =high	ranges from 1 = low to 5 =high	WDI (data available for 2006 and 2009) <sup>6</sup>

Notes:

- 1) Zero imports and exports were replaced by a small number (1E-30).
- 2) Missing tariff rates for the year 2010 for Armenia, Azerbaijan, Turkmenistan and Uzbekistan were set equal to the rates in 2009 to enable simulations for the year of 2010.
- 3) The FTA dummy does not consider the bilateral FTA's between the CIS countries due to the questionable implementation of the most of the FTA dating back to middle 90s.
- 4) The membership of the Customs Union is assumed to be in force for participating countries from 2007 – to take into account the anticipation effect of the CU formation.
- 5) The data was available for years: 1996, 1998, 2000, 2002-2010. The data for years 1997, 1999 and 2001 was generated using the linear extrapolation.

The definitions of the indicators are according to methodology by Kaufmann *et al.* (2010).

- *Voice and Accountability* – measures perceptions of the degree to which citizens can participate in government selection; freedom of expression, freedom of association and media.
- *Political Stability and Absence of Violence/ Terrorism* – measures the perceptions of the likelihood of government overthrow, political violence and terrorism.
- *Government Effectiveness* – measures the perceptions of public services' quality, civil services' quality, quality of formulation and implementation of polices and credibility of government's commitment to follow the policies.
- *Regulatory Quality* – measures the perceptions of governmental capabilities to draw and implement policies for development of private sector.
- *Rule of Law* – measures the perceptions of the contract reinforcement quality, respect for property rights, the quality of police and the courts, likelihood of crime and violence.
- *Control of Corruption* – measures the abuse of public power for petty and grand forms of corruption; degree to which the elites "control" the state.

- 6) The data for years 2007 and 2008 was generated using the linear extrapolation; the data for 2010 is set equal to that of 2009 to enable simulations for the year of 2010.

Table 9.7: The EViews output of the Jarque-Bera test

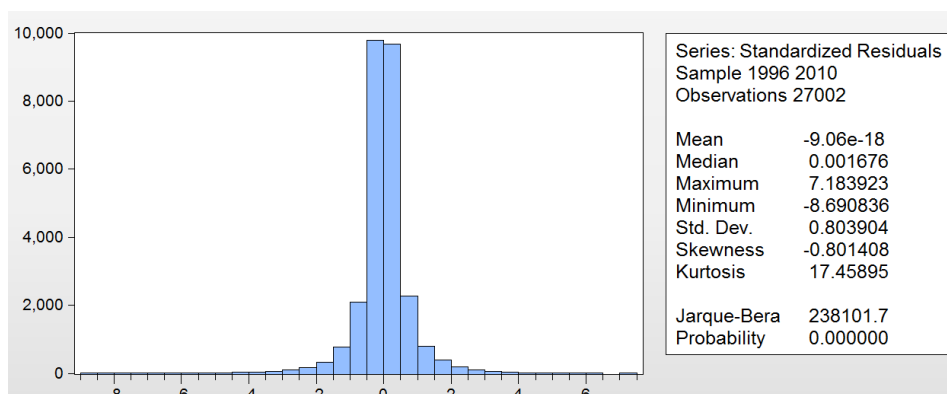


Table 9.8: The EViews output of the original regression for the Breusch-Pagan test

Dependent Variable: LNEEXPORT

Method: Panel Least Squares

Date: 01/31/12 Time: 12:39

Sample (adjusted): 1996 2010

Periods included: 15

Cross-sections included: 2138

Total panel (unbalanced) observations: 27002

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-12,3154	2,15983	-5,70203	0,00000
LNGDPI	0,58719	0,03047	19,26873	0,00000
LNGDPJ	0,77451	0,03169	24,44258	0,00000
CIS2	0,53531	0,10760	4,97494	0,00000
EU2	0,22841	0,03417	6,68422	0,00000
FTA	0,08026	0,02987	2,68681	0,00720
CISEU	-0,47520	0,04222	-11,25472	0,00000
EUCIS	-0,08635	0,04505	-1,91673	0,05530
WTO2	0,11851	0,02761	4,29233	0,00000
CISNONWTO_WTO	-0,10718	0,03786	-2,83103	0,00460
WTO_CISNONWTO	-0,00753	0,04519	-0,16655	0,86770
BKR2	0,21462	0,42855	0,50080	0,61650
CUBKR	-0,47164	0,23049	-2,04621	0,04070
CUBKR_CIS	-0,06865	0,11296	-0,60775	0,54340
CIS_CUBKR	-0,64235	0,10745	-5,97835	0,00000
LN_X_RATE	0,01458	0,00383	3,81010	0,00010
TB*LN_VOL	-0,00296	0,00021	-14,08207	0,00000
OIL_PRICE	-0,00524	0,04772	-0,10980	0,91260
GOVERNANCE_I	0,42936	0,04786	8,97029	0,00000
INFRASTRUCTURE_I	0,19061	0,06021	3,16582	0,00150
INFLATION_I	0,00048	0,00013	3,57427	0,00040
TARIFFJ	-0,00032	0,00056	-0,57187	0,56740
GOVERNANCE_J	0,14421	0,04930	2,92490	0,00340
INFRASTRUCTURE_J	0,03259	0,06043	0,53929	0,58970

Effects Specification

Cross-section fixed (dummy variables)

Period fixed (dummy variables)

R-squared	0,938613	Mean dependent var	4,189687
Adjusted R-squared	0,933238	S.D. dependent var	3,244634
S.E. of regression	0,838363	Akaike info criterion	2,562388
Sum squared resid	17449,70	Schwarz criterion	3,223190
Log likelihood	-32419,80	Hannan-Quinn criter.	2,775481
F-statistic	174,6121	Durbin-Watson stat	1,056188
Prob(F-statistic)	0,000000		

Table 9.9: The EViews output of the auxiliary regression for the Breusch-Pagan test

Dependent Variable: RESIDEQ361^2

Method: Panel Least Squares

Date: 01/31/12 Time: 12:46

Sample (adjusted): 1996 2010

Periods included: 15

Cross-sections included: 2138

Total panel (unbalanced) observations: 27002

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5,66498	5,58167	1,01493	0,31020
LNGDPI	-0,03290	0,07875	-0,41771	0,67620
LNGDPJ	-0,29964	0,08189	-3,65905	0,00030
CIS2	-0,14852	0,27808	-0,53409	0,59330
EU2	0,04742	0,08831	0,53695	0,59130
FTA	-0,10991	0,07719	-1,42387	0,15450
CISEU	0,58118	0,10912	5,32631	0,00000
EUCIS	-0,05790	0,11643	-0,49729	0,61900
WTO2	-0,07465	0,07135	-1,04619	0,29550
CISNONWTO_WTO	0,43200	0,09784	4,41533	0,00000
WTO_CISNONWTO	-0,02116	0,11678	-0,18118	0,85620
BKR2	-0,61205	1,10752	-0,55263	0,58050
CUBKR	0,16788	0,59566	0,28184	0,77810
CUBKR_CIS	0,03079	0,29191	0,10546	0,91600
CIS_CUBKR	0,71806	0,27767	2,58600	0,00970
LNK_RATE	-0,00570	0,00989	-0,57571	0,56480
TB*LNVOL	-0,00085	0,00054	-1,57032	0,11640
OIL_PRICE	0,00559	0,12332	0,04535	0,96380
GOVERNANCE_I	-0,27038	0,12370	-2,18586	0,02880
INFRASTRUCTURE_I	-0,21891	0,15560	-1,40686	0,15950
INFLATION_I	-0,00028	0,00035	-0,80642	0,42000
TARIFFJ	-0,00071	0,00144	-0,49508	0,62050
GOVERNANCE_J	0,08578	0,12742	0,67320	0,50080
INFRASTRUCTURE_J	-0,23547	0,15618	-1,50774	0,13160

Effects Specification

Cross-section fixed (dummy variables)

Period fixed (dummy variables)

R-squared	0,372093	Mean dependent var	0,646237
Adjusted R-squared	0,317110	S.D. dependent var	2,621810
S.E. of regression	2,166589	Akaike info criterion	4,461305
Sum squared resid	116540,6	Schwarz criterion	5,122107
Log likelihood	-58057,08	Hannan-Quinn criter.	4,674399
F-statistic	6,767395	Durbin-Watson stat	1,564313
Prob(F-statistic)	0,000000		

Table 9.10: The EViews output of the Hausman test: Random versus Fixed cross-section effects

Correlated Random Effects - Hausman Test

Equation: EQ5\_361RE

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	924.54022	23	0.00000

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
LNGDPI	0.50423	0.80702	0.00043	0.00000
LNGDPJ	0.68287	0.74327	0.00046	0.00470
CIS2	0.54155	1.29957	0.00312	0.00000
EU2	0.21340	0.28959	0.00009	0.00000
FTA	0.06138	0.14675	0.00005	0.00000
CISEU	-0.43347	-0.61642	0.00020	0.00000
EUCIS	-0.04589	-0.18701	0.00024	0.00000
WTO2	0.19545	0.11770	0.00004	0.00000
CISNONWTO_WTO	-0.04750	-0.09528	0.00009	0.00000
WTO_CISNONWTO	0.06198	-0.07464	0.00022	0.00000
BKR2	0.24100	0.94941	0.05468	0.00250
CUBKR	-0.36942	-0.32777	0.00463	0.54030
CUBKR_CIS	-0.05585	-0.12997	0.00033	0.00000
CIS_CUBKR	-0.60589	-0.66434	0.00029	0.00070
LN_X_RATE	0.01431	0.01465	0.00000	0.80990
TB*LN_VOL	-0.00301	-0.00277	0.00000	0.00000
OIL_PRICE	0.00147	-0.00395	0.00000	0.00000
GOVERNANCE_I	0.48270	0.31037	0.00091	0.00000
INFRASTRUCTURE_I	0.03526	0.01701	0.00111	0.58370
INFLATION_I	0.00034	0.00059	0.00000	0.00000
TARIFFJ	-0.00054	-0.00072	0.00000	0.00150
GOVERNANCE_J	0.19847	0.19210	0.00102	0.84150
INFRASTRUCTURE_J	-0.12518	-0.20542	0.00108	0.01460

Cross-section random effects test equation:

Dependent Variable: LNEXPRT

Method: Panel Least Squares

Date: 01/31/12 Time: 14:01

Sample (adjusted): 1996 2010

Periods included: 15

Cross-sections included: 2138

Total panel (unbalanced) observations: 27002

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-9.76945	0.38076	-25.65785	0.00000
LNGDPI	0.50423	0.02678	18.82993	0.00000
LNGDPJ	0.68287	0.02723	25.07519	0.00000
CIS2	0.54155	0.10724	5.04983	0.00000
EU2	0.21340	0.03326	6.41598	0.00000
FTA	0.06138	0.02960	2.07388	0.03810
CISEU	-0.43347	0.04201	-10.31778	0.00000
EUCIS	-0.04589	0.04480	-1.02454	0.30560
WTO2	0.19545	0.02576	7.58641	0.00000
CISNONWTO_WTO	-0.04750	0.03723	-1.27601	0.20200
WTO_CISNONWTO	0.06198	0.04470	1.38640	0.16560
BKR2	0.24100	0.42954	0.56106	0.57480
CUBKR	-0.36942	0.23089	-1.59995	0.10960
CUBKR_CIS	-0.05585	0.11294	-0.49450	0.62100
CIS_CUBKR	-0.60589	0.10736	-5.64359	0.00000
LN_X_RATE	0.01431	0.00384	3.72562	0.00020
TB*LN_VOL	-0.00301	0.00021	-14.27739	0.00000
OIL_PRICE	0.00147	0.00054	2.70901	0.00680
GOVERNANCE_I	0.48270	0.04726	10.21399	0.00000
INFRASTRUCTURE_I	0.03526	0.05865	0.60111	0.54780
INFLATION_I	0.00034	0.00013	2.54291	0.01100
TARIFFJ	-0.00054	0.00055	-0.99238	0.32100
GOVERNANCE_J	0.19847	0.04851	4.09133	0.00000
INFRASTRUCTURE_J	-0.12518	0.05876	-2.13013	0.03320

Effects Specification

Cross-section fixed (dummy variables)			
R-squared	0.938136	Mean dependent var	4.189687
Adjusted R-squared	0.932757	S.D. dependent var	3.244634
S.E. of regression	0.841373	Akaike info criterion	2.569084
Sum squared resid	17585.17	Schwarz criterion	3.225633
Log likelihood	-32524.21	Hannan-Quinn criter.	2.780806
F-statistic	174.3998	Durbin-Watson stat	1.052301
Prob(F-statistic)	0.000000		

Table 9.11: The estimated benefit in terms of extra % of export for the CIS countries from each of the improved governance indicators to the average level of the EU15

**Control of Corruption**

Country	Original value of Control of Corruption	Value of the EU15 for Control of Corruption	<u>Eviews Simulation</u> benefit in % of extra export	Manual Calculation benefit in % of extra export
Armenia	-0.59	1.48	15.99	15.31
Azerbaijan	-1.17	1.48	20.92	19.22
Belarus	-0.82	1.48	17.90	16.86
Georgia	-0.16	1.48	12.45	12.29
Kazakhstan	-1.00	1.48	19.42	18.06
Kyrgyzstan	-1.07	1.48	20.07	18.57
Moldova	-0.73	1.48	17.16	16.27
Russia	-1.07	1.48	20.07	18.57
Tajikistan	-1.17	1.48	20.92	19.22
Turkmenistan	-1.44	1.48	23.22	20.93
Ukraine	-0.97	1.48	19.19	17.88
Uzbekistan	-1.32	1.48	22.17	20.16

**Rule of Law**

Country	Original value of Rule of Law	Value of the EU15 for Rule of Law	<u>Eviews Simulation</u> benefit in % of extra export	Manual Calculation benefit in % of extra export
Armenia	-0.40	1.50	14.57	14.16
Azerbaijan	-0.88	1.50	18.62	17.48
Belarus	-1.05	1.50	20.01	18.56
Georgia	-0.21	1.50	13.03	12.84
Kazakhstan	-0.62	1.50	16.41	15.70
Kyrgyzstan	-1.29	1.50	22.14	20.18
Moldova	-0.40	1.50	14.58	14.17
Russia	-0.78	1.50	17.78	16.81
Tajikistan	-1.20	1.50	21.31	19.56
Turkmenistan	-1.46	1.50	23.57	21.24
Ukraine	-0.80	1.50	17.95	16.95
Uzbekistan	-1.37	1.50	22.85	20.71

**Regulatory Quality**

Country	Original value of Regulatory Quality	Value of the EU15 for Regulatory Quality	<u>Eviews Simulation</u> benefit in % of extra export	Manual Calculation benefit in % of extra export
Armenia	0.34	1.44	8.15	8.35
Azerbaijan	-0.44	1.44	14.43	13.98
Belarus	-1.17	1.44	20.49	18.85
Georgia	0.58	1.44	6.37	6.63
Kazakhstan	-0.32	1.44	13.44	13.14
Kyrgyzstan	-0.25	1.44	12.83	12.61
Moldova	-0.12	1.44	11.78	11.68
Russia	-0.39	1.44	14.02	13.63
Tajikistan	-1.06	1.44	19.58	18.15
Turkmenistan	-2.07	1.44	28.58	24.64
Ukraine	-0.55	1.44	15.30	14.71
Uzbekistan	-1.59	1.44	24.20	21.60

(continued on the next page)

### Voice and Accountability

Country	Original value of V&A	Value of the EU15 for V&A	<u>Eviews Simulation</u> benefit in % of extra export	Manual Calculation benefit in % of extra export
Armenia	-0.82	1.33	16.66	15.71
Azerbaijan	-1.27	1.33	20.46	18.68
Belarus	-1.55	1.33	22.91	20.50
Georgia	-0.17	1.33	11.35	11.21
Kazakhstan	-1.14	1.33	19.35	17.83
Kyrgyzstan	-0.96	1.33	17.77	16.60
Moldova	-0.07	1.33	10.53	10.48
Russia	-0.94	1.33	17.67	16.51
Tajikistan	-1.36	1.33	21.18	19.23
Turkmenistan	-2.03	1.33	27.16	23.49
Ukraine	-0.15	1.33	11.15	11.03
Uzbekistan	-2.02	1.33	27.06	23.42

### Government Effectiveness

Country	Original value of Government Effectiveness	Value of the EU15 for Government Effectiveness	<u>Eviews Simulation</u> benefit in % of extra export	Manual Calculation benefit in % of extra export
Armenia	0.07	1.48	10.66	10.71
Azerbaijan	-0.84	1.48	18.09	17.04
Belarus	-1.13	1.48	20.59	18.99
Georgia	0.29	1.48	8.92	9.11
Kazakhstan	-0.28	1.48	13.45	13.18
Kyrgyzstan	-0.63	1.48	16.35	15.63
Moldova	-0.63	1.48	16.33	15.61
Russia	-0.39	1.48	14.39	13.99
Tajikistan	-0.91	1.48	18.66	17.49
Turkmenistan	-1.58	1.48	24.49	21.87
Ukraine	-0.77	1.48	17.55	16.60
Uzbekistan	-0.80	1.48	17.74	16.75

### Political Stability & Absence of Violence

Country	Original value of Political Stability & Absence of Violence	Value of the EU15 for Political Stability & Absence of Violence	<u>Eviews Simulation</u> benefit in % of extra export	Manual Calculation benefit in % of extra export
Armenia	0.09	0.77	4.96	4.99
Azerbaijan	-0.31	0.77	7.99	7.82
Belarus	-0.11	0.77	6.48	6.43
Georgia	-0.68	0.77	10.92	10.40
Kazakhstan	0.46	0.77	2.20	2.27
Kyrgyzstan	-0.96	0.77	13.12	12.25
Moldova	-0.42	0.77	8.84	8.58
Russia	-0.89	0.77	12.56	11.79
Tajikistan	-0.91	0.77	12.76	11.95
Turkmenistan	0.24	0.77	3.82	3.89
Ukraine	-0.10	0.77	6.42	6.37
Uzbekistan	-0.78	0.77	11.68	11.04

Notes:

1) Results obtained from Eviews simulations are leading in the study.

2) Manual calculation of the benefit is done to as a check. The results are less precise due to the non-linear character of the log function.

Manual calculation is done as follows:  $(e^{((\text{coefficient} * \text{EU15 value})/6)} - e^{((\text{coefficient} * \text{original value})/6)}) * 100\%$ . Division by 6 is necessary as the coefficient of the governance variable is a composite of the six indicators and simulation involves the change of only one out of six indicators to the level of the EU15.

Example calculation of benefit in % of extra export for Armenia from improved level of Control of Corruption:  $(e^{((0.429 * 1.48)/6)} - e^{((0.429 * (-0.59)/6)}) * 100\% = 15.31\%$ .

Table 9.12: List of the abbreviations of groups of countries

CIS	Armenia, Azerbaijan, Belarus, Georgia*, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan*, Ukraine, Uzbekistan.
EU15	Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.
EU2004	Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia.
EU2007	Bulgaria, Romania.
EU27	EU15+EU 2004 +EU2007.

*Note:* Georgia quit the CIS in 2009, Turkmenistan quit the CIS in 2005.