



**AgEcon** SEARCH

RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

*No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.*



**Global Trade Analysis Project**

<https://www.gtap.agecon.purdue.edu/>

This paper is from the  
GTAP Annual Conference on Global Economic Analysis  
<https://www.gtap.agecon.purdue.edu/events/conferences/default.asp>

**DRAFT: PRELIMINARY VERSION.**

**DO NOT QUOTE WITHOUT THE PERMISSION OF THE AUTHORS**

***Estimating the effects of EU enlargement, WTO accession and formation of FTA with EU or CIS on Russian economy<sup>1</sup>***

Alexander Alekseev<sup>2</sup>, Denis Sokolov<sup>3</sup>, Natalia Tourdyeva<sup>4</sup>, Ksenia Yudaeva<sup>5</sup>

**Abstract:** We estimate effects of Russia's trade policy options on the production, welfare and trade flows. The computable general equilibrium model is used in the analysis. We show that Russia loses in the case of EU enlargement unless non-tariff barriers in the accession countries are changed to the level of the EU. In all other trade arrangements – WTO accession, formation of Russia-EU FTA, and formation of a FTA between Russia and other CIS countries Russia improves its welfare.

This seems to be the first paper, which includes data on CIS countries other than Russia. We show that CIS countries experience substantial gains from formation of a FTA with Russia.

Another novelty of this paper is an attempt to estimate non-tariff barriers to trade in the FSU region, and to accommodate the effect of their changes in the model. Inclusion of non-tariff barriers often changes the results dramatically, suggesting that CGE literature should pay more attention to incorporating such barriers.

**Keywords:** CGE, EU enlargement, Russia, WTO accession, CIS, Free Trade Area, non-tariff measures of protection (NTM)

**April 2004  
(First version – November 2003)**

---

<sup>1</sup> The first version of the paper was written in the framework of GET projects in the New Economic School (NES). This paper benefited from the US AID SEGIR EP # PCE-I-00-00-00014-00, Russia Task Order #803 Improvement of Economic Policy Through TTP project. The opinions, findings, and conclusions of recommendations expressed herein are those of the authors and do not necessarily reflect views of the US AID.

<sup>2</sup> Centre for Economic and Financial Research (CEFIR), NES; corresponding author; e-mail address: aalekseev@cefir.ru

<sup>3</sup> CEFIR, NES

<sup>4</sup> CEFIR, NES

<sup>5</sup> CEFIR, Carnegie Endowment for International Peace, NES

## Contents

|     |   |    |
|-----|---|----|
| 1.  | Introduction.....   | 3  |
| 2.  | The Model.....  | 6  |
| 3.  | DATA .....  | 10 |
| 3.1 | Construction of the Dataset for Russia. ....                                    | 10 |
| 3.2 | Construction of the Dataset for the CIS counties.....                           | 10 |
| 3.3 | Construction of the Datasets for the Accession Countries, the EU, and ROW. .... | 12 |
| 3.4 | Classification mapping system. ....   | 12 |
| 3.5 | Estimation of non-tariff barriers .....   | 12 |
| 4.  | EU enlargement. ....  | 15 |
| 5.  | Russia's WTO accession.....   | 23 |
| 6.  | Free Trade Area between Russia and the EU-25 .....                              | 29 |
| 7.  | Free Trade Area between Russia and the CIS .....                                | 34 |
| 8.  | Conclusions.....  | 39 |
| 9.  | Bibliography. ....  | 40 |

# 1. Introduction

Russian government is now in the stage of shaping its new economic policies that are to lead to the declared goals of sustainable growth, poverty reduction, and diversification of the industry structure away from resource sectors. One of the major fields of economic policy for Russia is international trade. Wise decisions in the international trade can help a lot in achieving declared goals, and vice versa – chaotic change of government statements in this sphere may be very harmful for the economy. Those who observe Russia's trade policy could have noticed that it lacks coherent strategy. On the one hand, there is no lack of statements that Russia would like to become a member or to form a multi-country union based on more liberal trade policy across members. On the other hand, the effective policy is becoming more and more protective: new tariff and non-tariff barriers are being installed against trade with countries from both “near” and “far” abroad. The source of this ambiguity, in our mind, is the lack of clear understanding of the overall effects of trade liberalization, combined with effective lobbying by some industries. The aim of this paper is to improve the overall understanding of the effects of various trade liberalization scenarios. The paper considers several trade policy options, and compares their effects on welfare, trade flows, and production of Russia and other countries.

In particular, this paper uses the CGE methodology to analyze effects of four different processes: EU enlargement, Russia's WTO accession, creation of the Common European Economic Space between Russia and the EU and regional integration among the CIS countries. While reporting the results of the modeling we concentrate on the effects on welfare, production and trade structure of Russia.

The first stage of the eastward enlargement of the European Union is completed by May 1<sup>st</sup>, 2004. The EU is the largest trade partner of Russia, and after accession of the new members the EU share in Russian trade increased to about 50%. Therefore, accession will certainly affect Russian economy. To properly model the accession process one has to take into consideration both tariff and non-tariff measures of protection. In the paper we consider several scenarios of changes of both of these types on production, trade and welfare and compare their effects.

The second question we deal with is effects of Russia's accession to the WTO. The accession process started in 1994, when Russia announced its intention to be a member of the GATT. By now the negotiation process is still not completed. For our research this fact means that we should use the base scenario of the EU enlargement as benchmark equilibrium in accessing effects of Russia's WTO accession.

The third subject of our research is creation of the Common European Economic Space (CEES) between EU and Russia. This political initiative was first announced a few years ago on a high-level meeting of Russian and European politicians. Since then the clear form of the CEES has not been decided upon, however from various official statements one can get a feeling that the final agreement will not include trade liberalization directly. At the same time many observers Hamilton [5] argue that establishing an FTA between the EU and Russia would be more beneficial to both countries than the current arrangement. To test this hypothesis, we model CEES as a free trade area (FTA) between Russia and the enlarged Europe.

The final experiment, which we analyze, is simulation of a FTA between the countries of the Commonwealth of the Independent States (CIS). While lacking coherence, and all other trade policy directions, the CIS direction in the Russian trade policy became quite active in the recent past. Four post-soviet countries – Russia, Ukraine, Kazakhstan and Belarus – declared their will for tighter regional integration. In our experiment we go a little bit further and set a full FTA between Russia and CIS countries, which was the original plan in forming the CIS. We should note here, that CIS countries have a number of bilateral and multilateral FTA agreements, but these agreements do not work properly and de facto trade between CIS countries is subject to tariff and non-tariff measures of protection.

The CGE model, used in this paper, is very simple in its industrial structure. It consists of 15 production sectors; composition of production is the optimal point on the production possibility frontier. There are two features of this model, which differ it from all other CGE models. First of all, to our knowledge this is the first model, which includes data on CIS and Russia separately and models the effect on FTA between these countries. Secondly, in the model we try to incorporate non-tariff barriers to trade, and to model the effect of their changes as a result of establishing various trade agreements. Non-tariff barriers are imputed using residuals from gravity model.

The paper is organized as follows. Section 2 focuses on the mathematical representation of the model. Section 3 analyses the effects of the enlargement of the European Union for the Russian economy. In section 4 we analyze the effects of Russia's WTO accession on Russian economy by means of our GCE model. There is a discussion of the potential free trade area between Russian and the EU-25 in the section 5. Section 6 focuses on the Russia-CIS FTA.

## 2. The Model

The model is a comparative static CGE model that incorporates 5 geographical regions, each represented as a single economy. Regions are Russia, the European Union, the accession countries, CIS countries and the rest of the world:

- **Russia**
- **15 countries of the European Union (EU):** Belgium, Denmark, Germany, Greece, Spain, France, Ireland, Italy, Luxembourg, the Netherlands, Austria, Portugal, Finland, Sweden, the United Kingdom
- **10 Accession Countries (AC)<sup>6</sup>:** Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia
- **11 countries of the Commonwealth of the Independent States (CIS):** Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan, Turkmenistan, Ukraine, Uzbekistan
- **Rest of the World (ROW)**

In each economy there are the following producing sectors.

***Table 2-1: Producing sectors***

|   |                                    |    |                                    |
|---|------------------------------------|----|------------------------------------|
| 1 | Electricity and heat               | 9  | Food-processing Industry           |
| 2 | Oil and Gas                        | 10 | Other industries                   |
| 3 | Other Fuels                        | 11 | Agriculture, services and forestry |
| 4 | Ferrous metallurgy                 | 12 | Construction                       |
| 5 | Nonferrous metallurgy              | 13 | Transport & Communication          |
| 6 | Chemical industry and oil refinery | 14 | Other services                     |
| 7 | Machinery and equipment            | 15 | Finance, banking and insurance     |
| 8 | Light industry                     |    |                                    |

A comparative static model compares the economy at two distinct points in time, without modeling any explicit transition process or time path. Typically, the two states compared are the state of the economy with a given policy change and the state of the economy without the policy change. Consequently, this method of analysis does not provide any details of the adjustment path of the economy between the two points in time.

<sup>6</sup> In the text terms accession countries (AC), new member-states (NMS), countries of the central and eastern Europe (CEES), countries candidates (CC) mean the same set of 10 countries defined above.



All markets in this model are perfectly competitive. The economies of all the regions are modeled as large economies. That is, changes in relative prices within the region can only affect relative prices on the same goods produced in the other regions.

Since this is a multiregional model aimed at the quantitative evaluation of trade policies, Armington assumption is applied in the modeling. This means that similar goods produced in different regions are considered as different goods. In consumer's preferences these goods are aggregated into a composite commodity by means of corresponding elasticities of substitution (Armington elasticities). Following Zemnitsky [20] for Russia we use levels of Armington elasticities that are represented in the *Table 2-2*. Armington elasticities for all other regions are set to 0.9.

***Table 2-2. Levels of Armington elasticities for Russia***

| <b><i>Commodity group and services</i></b>     | <b><i>Armington elasticities for Russia</i></b> |
|--|---|
| Electricity and heat                           | 0.75  |
| Oil and Gas                                    | 0.75  |
| Other Fuels                                    | 0.75  |
| Products of ferrous metallurgy                 | 0.81  |
| Products of nonferrous metallurgy              | 0.81  |
| Products of chemical industry and oil refinery | 0.83  |
| Products of machinery and equipment            | 0.59  |
| Products of light industry                     | 0.94  |
| Products of food-processing industry           | 0.79  |
| Products of other industries                   | 0.80  |
| Products of agriculture and forestry           | 0.61  |
| Construction services                          | 0.60  |
| Transport and communication services           | 0.60  |
| Other services                                 | 0.60  |
| Finance, banking and insurance services        | 0.60  |

Results of the simulations are robust if we fluctuate around unity levels of Armington tariffs. But implementing huge levels (around 30 or 40) gives us either unfeasibility of the model or reverses the trends in utility levels. In absence of an econometric study on the levels of Armington elasticities that are applicable to the Russia we use the above figures<sup>7</sup>.

In each region the model introduces a representative consumer and production capacities belong to this representative consumer. There is a government that collects tariffs and taxes

<sup>7</sup> Preliminary results of the work in progress Shestalova [15] gives estimates of long-run Armington elasticities are in the range of 0.56-1.28. We did not use her results due to some methodological pitfalls: instead of using Russian consumption data the paper uses production data. Therefore we decided to not use the elasticities reported in this paper. These elasticities, however, do not differ substantially from the elasticities, used in this paper.

and transfers all the revenues to the consumer. Government's revenues are tariff revenue from foreign trade, and tax revenue collected from domestic producers. We introduce world trade balance as an external closure.

**Producers.**

On the production side, we use a constant elasticity of transformation production function:

$$Y_j = \left[ \sum_{i=1}^{15} \beta_{ij} S_{ij}^{\sigma_j^p} \right]^{\frac{1}{\sigma_j^p}} \tag{1}$$

where indices  $i$  and  $j$  represent products and regions respectively.

$Y_j$  is an overall production in region  $i$  (GDP).

$S_{ij}$  - production of good  $i$  in region  $j$ .

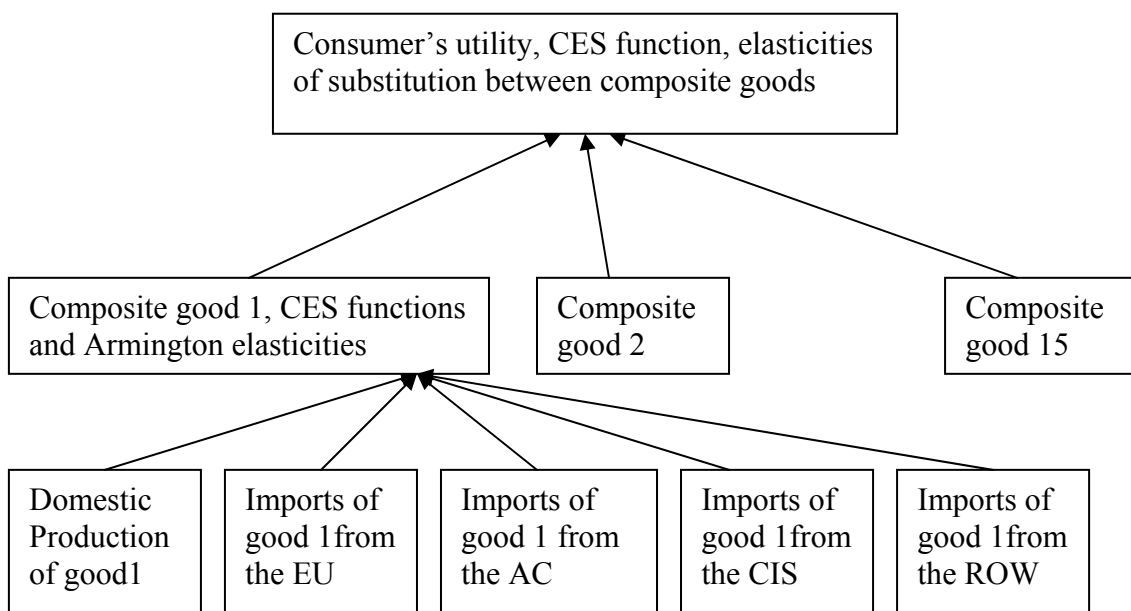
$\beta_{ij}$  - share parameters that are calibrated in the model,  $\sum_{i=1}^{15} \beta_{ij} = 1$

$\sigma_j^p$  is the region  $j$  elasticity of transformation.

**Consumers.**

Consumers are presented by a 2 level nested CES function. The structure of consumer's demand, for example, in Russia can be represented by the following figure.

**Figure 2-1 : Consumer's demand.**



More specifically, consumer's utility is represented by the following functions.

$$U_j = \left[ \sum_{i=1}^{15} \gamma_{ij} C_{ij}^{\frac{1}{\sigma_{ij}^p}} \right]^{\sigma_{ij}^p} \quad (j = 1 \dots 5) \quad (2)$$

where

$U_j$  - utility in region  $j$ ,

$\gamma_{ij}$  - the share parameter,  $i$  and  $j$  are product and region indices.

$C_{ij}$  - is the composite of type  $i$  in region  $j$

$\sigma_{ij}^p$  - is the elasticity of substitution among composites in region  $j$ .

Each composite,  $C_{ij}$ , is, in turn, given by a CES function

$$C_{ij} = \left[ \sum_{k=1}^5 \gamma_{ijk} (C_{ij}^k)^{\frac{1}{\sigma_{ij}^l}} \right]^{\sigma_{ij}^l} \quad \begin{array}{l} (i = 1 \dots 15) \\ (j = 1 \dots 5) \end{array} \quad (3)$$

where

$C_{ij}$  is the composite of type  $i$  consumed in region  $j$ ,

$\gamma_{ijk}$  are the share parameters for function  $(i, j)$  across the  $k$  sources of supply

$$\left( \sum_{k=1}^5 \gamma_{ijk} = 1 \right),$$

$C_{ij}^k$  is the consumption of good of type  $i$  in region  $j$  supplied by region  $k$

$\sigma_{ij}^l$  - lower level substitution elasticities for the function  $(i, j)$ .

### **3. Benchmark Dataset**

The model is calibrated to the 2000 data. In those cases, where such data were not available, for example in the case of some CIS data, we used data for the earlier years corrected for GDP growth.

#### **3.1 Construction of the Dataset for Russia**

Production for Russia was taken from the “Input-output tables for 2000” reported by Goskomstat, the official Russian statistical bureau.

Russian trade data comes from two sources: custom statistics provided by the State Customs Committee [24], and, “Russian trade in services” published by the Bank of Russia [22].

Construction of the Russian tariffs was the most difficult and challenging issue. It is well known that the nominal tariffs rates reported in the customs legislation do not reflect really collected customs duties. Therefore, we constructed tariff rate data using information about collected customs duties on a transaction basis. In contrast to the common opinion, the resulting tariff rates often look higher than the nominal marginal rates, stipulated by the legislation. This result can be explained by the presence of mixed tariff schemes in Russian legislation – minimum ad valor rate per transaction and proportionate level.

#### **3.2 Construction of the dataset for the CIS counties**

Dataset for the CIS counties was constructed using a large number of sources. Though there is an official statistical agency of CIS, called “Interstate Statistical Committee of the Commonwealth of Independent States,” it does not provide data on the output per sectors in nominal values. It publishes data on the output of some selected goods in physical volumes, while domestic prices for these goods are not available. Therefore we used data published by the official statistical agencies of each country in the region, country reports of IMF, reports

and statistical publications of different policy advising and research oriented agencies<sup>8</sup>. Then data was recalculated from the domestic currencies of these countries into USD by the official exchange rates. Trade data originates from database of the International Trade Center UNCTUD/WTO<sup>9</sup>. Nominal tariffs rates for 4-digit level were obtained from UNCTAD-TRAINS (TRade Analysis and INformation System), then aggregated into 15 sectors according to the size of imports weights.

Construction of the dataset for CIS was accompanied with several problems caused by the poor quality of the CIS trade data. A good reference on this issue is the report “*Trade performance and regional integration of the CIS countries*” by Freikman et al. [9] which provides a detailed study of errors and flaws in the CIS trade flow data reported by UN COMTRADE<sup>10</sup>. There are two main problems of the CIS trade statistics. The first one is that imports are recorded in CIF prices while exports are recorded in FOB prices. Domestic prices in the countries of CIS and world prices for some goods differ quite substantially, resulting in the persistent problems in recording of international transactions. The second problem is that some countries of the CIS, such as Kazakhstan (which accounts for a huge part of the CIS economy) are transition countries for trade flows between other CIS countries. As a result, trade figures for such countries are often overestimated. To provide an example of such misreporting, we could refer to the case of transition of Russian gas by the pipeline through Ukraine and Belarus. These latter two countries report this gas as their imports and exports, thus artificially increasing the sizes of both export and import. In [9] authors tried to estimate the share of these errors in the intra-trade flows of CIS, and received the coefficient of 27%. We corrected the data on two industries: oil and gas, and other fuels - on this coefficient.

Distortions in trade statistics bias estimated of the countries consumption data, which is calculated on a residual basis. One of the problem that occurs in this direction is estimation of the consumption of nonferrous metallurgy products in the CIS countries. Due to tax evasion of exporters in this industry and the drawbacks in customs legislation that they use to avoid paying VAT (value added tax) we have very small, in some countries negative figures for non-ferrous metals consumption. Due to the lack of research in this field, we use expert estimates in resizing of exports of “Nonferrous Metallurgy” products uniformly by regions of destination up to the levels that correspond to small domestic consumption.

---

<sup>8</sup> Country report by The Economist Intelligence Unit Limited (United Kingdom); a report by Asian Development Bank; “Quarterly Review of Uzbek Economy” and “Quarterly Review of Finance Market in Uzbekistan” by Bearing Point, Uzbekistan.

<sup>9</sup> <http://www.intracen.org/mas/pctas.htm>

<sup>10</sup> United Nation Statistical Division Commodity Trade database

### **3.3 Construction of the datasets for the Accession Countries, the EU, and the ROW**

Production for the ACs and the EU as well as trade data for the EU were obtained from the EuroStat databases. Trade data for the candidates was taken from UNCTUD/WTO database on international trade flows, and tariffs were calculated using the same procedure as for the CIS countries: nominal tariffs rates published in UNCTAD-TRAINS were weighted with the shares of imports by regions and sectors. The rest of the world countries (ROW) data was calculated on a residual basis.

### **3.4 Classification mapping system**

Another problem in the construction of the dataset was the lack of the mapping system between Russian classification of the data on production and trade in goods and services and that of in the EU and the candidates countries. We started with the 5-digit Russian production classification system OKONH and chooses 15 sectors that included 10 industrial ones, and 5 sectors covering agriculture and services. Then, using mapping system between OKDP and OKONH provided by GOSKOMSTAT [23] we selected 4-digit positions in ISIC (International Standard Industrial Classification of all Economic Activities) that corresponded to these sectors. Finally, corresponding positions of ISIC were mapped to NACE (classification system of the EU) thus we obtained the mapping system between OKONH and NACE. Since the candidates use the same system as the European Union, this mapping system was also used for the candidates.

### **3.5 Estimation of non-tariff barriers**

The main tool of the analysis is a gravity model. The basic idea is to explain bilateral trade (import) in particular sector by economic variables and consider “unexplained” part (residual) as a result of trade policy. Algorithm consists of three parts. First, fit the observed patterns of trade with economic variables and obtain “predicted” volumes of import. Second, for each pair of macro-regions and for each sector sum up the observed volumes of import and predicted volumes of import. Finally, use the ratio of potential (predicted) volumes to

factual (observed) volumes to obtain the estimates of tariff equivalents of NTM using the following formula:  $\frac{M_{ij}^{factual}}{M_{ij}^{potential}} = (1 + NTB_{ij})^\varepsilon$ , where  $\varepsilon$  is the elasticity of import demand function.

The sector-specific gravity model is estimated by OLS. Economic variables are GDPs of countries in pair, GDPs per capita, land area, dummies for countries with different levels of income and specific to each sector variables that should capture specialization of countries in this particular sector. Distance between countries are proxied by geographical distance (being landlocked, having common border). Dummies for geographical regions constitute another set of explanatory variables. Finally, to pick out only “non-tariff” part of trade policy the regression equation also controls for import tariffs. Box 1 presented in appendix contains the full list of all explanatory variables. It should be noted that ROW macro-region was represented in data as a single country with characteristics constructed as the weighted (by bilateral trade between particular pair of countries) sum of corresponding explanatory variables for individual countries.

Fitting regression equation gives the estimated (“potential”) volumes of import for each pair of countries. To evaluate the average tariff equivalents of non-tariff barriers between blocks of countries the elasticities from Francois et al [8], are used (see Table 1.2 in appendix). Due to the nature of method used, some potential volumes are higher than actual volumes of trade that implies negative values of tariff-equivalents. Following Francois et al, 2003, all negative values are replaced by zeros.

The estimated tariff equivalents are presented in appendix table 1.3. Most figures look reasonable. As an example, the most protected sector is agriculture. For comparison, Messerlin [12], reports tariff equivalents of NTM for selected farm products for EU ranged from 40% for pork to 234% for sugar. NTM are less severe for pairs “EU-ACs” (due to forthcoming enlargement of EU) and “RUS-CIS” (RTA is in place).

However, there are also some unexpected results. First, the estimated tariff equivalent of NTM for importing the production of “Electricity and heat” sector from EU to RUS is extremely high. One of the possible explanations is that specificity of this sector cannot be captured by gravity model (for example, the regression equation does not control for infrastructural quality). Second, there is some bias in estimates for ROW. As it can be seen from the table, figures for ROW are much larger than for other pairs. This may be the result of

using the residuals from gravity model which contain too much noise – the well-known problem in gravity model specification.



## 4. EU enlargement

A common concern regarding EU enlargement is that it may lead to trade diversion from other countries, including Russia. Some of the previous studies, such as Sumalaa and Widgren [17] or Vinhas de Souza [16], confirm the hypothesis that FSU welfare declines after the enlargement, unless there are significant productivity improvements in Russia. These studies only take into consideration changes in tariff barriers to trade. In the same time, there is a number of non-tariff measures (NTM), which both the EU and accession countries use against Russia, and the Russian government claims that non-tariff barriers toward Russian goods may increase after the enlargement. Therefore, in this paper we make an attempt to compute the effects of the EU accession taking changes in NTM into consideration.

We consider the following scenarios. In the first scenario we model the enlargement process without including the estimates of the tariff equivalent of NTM of protection in the model at all (Enlargement-1 scenario). This gives us a basis for comparison with the literature on the subject. Then we incorporate estimation of the NTM in the model and simulate the enlargement process in different ways: replicating the first scenario, which gives us zero tariff rates between EU and AC, AC adopts the same tariff rates for all the regions as EU has. But we do not change NTM in any region. (Enlargement-2 scenario). Comparison of the results of scenarios Enlargement-1 and Enlargement-2 provides information about importance of accounting for the NTM in the model. Next step is to introduce zero NTMs between EU and AC after the accession. (Enlargement-3 scenario). This scenario suppose to take into consideration harmonization of legislation between the EU and AC, which should also stimulate trade between these two regions. Finally in the Enlargement-4 scenario we set both tariff and NTM protection in the AC to the EU-15 levels. This scenario is supposed to take into account the fact that the EU uses a number of non-tariff protection measures, and these measures will automatically be attributed to the AC after the accession.

### **The Enlargement-1 scenario: Customs union between EU and AC (no NTMs.)**

We simulate accession of the 10 countries to the European customs union. Accession countries reduce their tariff rates with EU to zero and set tariff towards other regions on the EU levels.

#### **Table 4-1 : Benchmark tariff levels by region.**

**Benchmark tariff levels on goods**

| <b>EU-15 import tariffs</b>        | From Russia | From AC  | From CIS | From ROW |
|------------------------------------|-------------|----------|----------|----------|
| Electricity and heat               | 0.00000%    | 0.00000% | 0.00000% | 0.00000% |
| Oil and gas                        | 0.00000%    | 0.00000% | 0.00000% | 0.23537% |
| Other fuels                        | 0.00000%    | 0.00000% | 0.00000% | 0.00000% |
| Ferrous metallurgy                 | 0.12901%    | 0.00000% | 0.73550% | 2.05646% |
| Nonferrous metallurgy              | 1.45847%    | 0.00027% | 0.56707% | 1.28104% |
| Chemical industry and oil refinery | 1.17714%    | 0.00012% | 3.50905% | 4.46599% |
| Machinery and equipment            | 0.94857%    | 0.00002% | 0.37784% | 1.96658% |
| Light industry                     | 7.98757%    | 0.00005% | 8.02539% | 9.89362% |
| Food-processing industry           | 2.63870%    | 2.52149% | 5.27055% | 6.56990% |
| Other industries                   | 0.49104%    | 0.00007% | 0.60847% | 1.89720% |
| Agriculture and forestry           | 0.00015%    | 0.00609% | 0.00001% | 0.18045% |
| Construction                       | 0.00000%    | 0.00000% | 0.00000% | 0.00000% |
| Transport and communication        | 0.00000%    | 0.00000% | 0.00000% | 0.00000% |
| Other services                     | 0.12960%    | 0.00000% | 0.22374% | 0.71192% |
| Finance, banking and insurance     | 0.00000%    | 0.00000% | 0.00000% | 0.00000% |

**Benchmark tariff levels on goods**

| <b>AC-10 import tariffs</b>        | From Russia | From EU  | From CIS | From ROW |
|------------------------------------|-------------|----------|----------|----------|
| Electricity and heat               | 1.4177%     | 1.0110%  | 1.4177%  | 1.4177%  |
| Oil and gas                        | 2.0766%     | 2.0463%  | 2.0766%  | 2.0766%  |
| Other fuels                        | 3.1358%     | 1.0098%  | 3.1358%  | 3.1358%  |
| Ferrous metallurgy                 | 9.0029%     | 1.1696%  | 9.0029%  | 9.0029%  |
| Nonferrous metallurgy              | 7.4467%     | 1.1897%  | 7.4467%  | 7.4467%  |
| Chemical industry and oil refinery | 6.7996%     | 1.9131%  | 6.7996%  | 6.7996%  |
| Machinery and equipment            | 4.9169%     | 1.7405%  | 4.9169%  | 4.9169%  |
| Light industry                     | 11.1020%    | 2.0803%  | 11.1020% | 11.1020% |
| Food-processing industry           | 17.6880%    | 11.1048% | 17.6880% | 17.6880% |
| Other industries                   | 6.3838%     | 1.5137%  | 6.3838%  | 6.3838%  |
| Agriculture and forestry           | 17.6773%    | 8.6417%  | 17.6773% | 17.6773% |
| Construction                       | 0.0000%     | 0.0000%  | 0.0000%  | 0.0000%  |
| Transport and communication        | 0.0000%     | 0.0000%  | 0.0000%  | 0.0000%  |
| Other services                     | 7.7563%     | 3.9258%  | 7.7563%  | 7.7563%  |
| Finance, banking and insurance     | 14.8008%    | 14.8008% | 14.8008% | 14.8008% |

The enlargement-1 scenario does not take into account NTM of protection. Since EU tariffs on average are lower than the AC, accession of 10 countries to the EU results in reduction of tariff protection for ACs both toward goods from the EU, and from other countries. This scenario cases slight negative effect in Russia's terms of trade (-1.7%, see Table 4-3). The accession countries suffer from the change in the terms of trade in a much greater extent than Russia do. Significant decrease in imports from all trading partners can also be explained due to decreasing tariff revenue (-23.4%).

**Table 4-2: Percentage change in total trade flows after Enlargment-1**

| Source<br>Destination | RUS    | EU     | AC    | CIS    | ROW    |
|-----------------------|--------|--------|-------|--------|--------|
| RUS                   |        | -0.46% | 3.51% | -0.43% | -0.73% |
| EU                    | 0.53%  |        | 4.73% | 0.06%  | -0.33% |
| AC                    | -3.13% | -4.81% |       | -0.16% | -1.69% |
| CIS                   | 0.48%  | -0.03% | 4.85% |        | -0.37% |
| ROW                   | 0.82%  | 0.33%  | 5.14% | 0.36%  |        |

***Table 4-3: Terms of trade by regions.***

|     |                       | Benchmark    | EU<br>Enlargement-1 | Percentage<br>Change |
|-----|-----------------------|--------------|---------------------|----------------------|
| RUS | price of export       | 1.138        | 1.122               | -1.45%               |
|     | price of import       | 1.157        | 1.153               | -0.38%               |
|     | <b>Terms of Trade</b> | <b>0.984</b> | <b>0.973</b>        | <b>-1.07%</b>        |
| EU  | price of export       | 1.134        | 1.129               | -0.44%               |
|     | price of import       | 1.126        | 1.123               | -0.24%               |
|     | <b>Terms of Trade</b> | <b>1.007</b> | <b>1.005</b>        | <b>-0.20%</b>        |
| AC  | price of export       | 1.131        | 1.071               | -5.30%               |
|     | price of import       | 1.187        | 1.129               | -4.89%               |
|     | <b>Terms of Trade</b> | <b>0.953</b> | <b>0.948</b>        | <b>-0.44%</b>        |
| CIS | price of export       | 1.151        | 1.140               | -0.92%               |
|     | price of import       | 1.177        | 1.172               | -0.38%               |
|     | <b>Terms of Trade</b> | <b>0.978</b> | <b>0.973</b>        | <b>-0.54%</b>        |
| ROW | price of export       | 1.133        | 1.128               | -0.52%               |
|     | price of import       | 1.132        | 1.127               | -0.46%               |
|     | <b>Terms of Trade</b> | <b>1.001</b> | <b>1.001</b>        | <b>-0.07%</b>        |

This terms of trade effect can explain the strange welfare pattern, which we observe in this scenario. AC welfare falls after accession.<sup>11</sup> Russian welfare also decreases slightly. The same is true in the case of the EU, although the amount of change in the case of the EU is almost negligible. Since by construction GDP is constant in our model, this result is similar to the result, obtained in Lejour et al. [11].

equivalent variations

|      |        |
|------|--------|
| RUS  | -0.071 |
| EU   | -0.007 |
| CEEC | -2.369 |
| CIS  | 0.014  |
| ROW  | 0.050  |

Changes in terms of trade and volume of trade flows account for structural changes in the Russian economy:

<sup>11</sup> The model can not be solved if we increase elasticities to the level, which excludes terms of trade effect. However, increase in elasticities leads to decrease in the negative number of welfare losses in accession countries, suggesting the result is indeed due to the terms of trade effect.

***Table 4-4: Changes in Russian production and trade.***

| <b>RUSSIA</b>                      | Benchmark production, mln USD | Percentage change | Benchmark exports, mln USD | Percentage change | Benchmark imports, mln USD | Percentage change |
|------------------------------------|-------------------------------|-------------------|----------------------------|-------------------|----------------------------|-------------------|
| Electricity and heat               | 14 479                        | -0.009%           | 138                        | -0.297%           | 10                         | 2.669%            |
| Oil and gas                        | 91 344                        | -0.170%           | 44 768                     | -0.505%           | 1 035                      | -0.323%           |
| Other fuels                        | 4 335                         | 0.114%            | 2 271                      | 0.335%            | 86                         | -0.226%           |
| Ferrous metallurgy                 | 17 296                        | 0.335%            | 14 401                     | 0.475%            | 3 639                      | -0.505%           |
| Nonferrous metallurgy              | 23 965                        | 0.222%            | 16 634                     | 0.427%            | 773                        | -0.571%           |
| Chemical industry and oil refinery | 16 840                        | 0.140%            | 8 853                      | 0.414%            | 4 055                      | -0.426%           |
| Machinery and equipment            | 36 837                        | -0.051%           | 12 651                     | -0.072%           | 15 122                     | -0.383%           |
| Light industry                     | 4 927                         | 0.071%            | 772                        | 0.895%            | 1 187                      | -0.580%           |
| Food-processing industry           | 45 236                        | 0.028%            | 2 340                      | 1.560%            | 8 347                      | -0.503%           |
| Other industries                   | 24 739                        | 0.090%            | 8 523                      | 0.466%            | 5 766                      | -0.129%           |
| Agriculture and forestry           | 30 854                        | -0.005%           | 511                        | 1.424%            | 2 607                      | -0.496%           |
| Construction                       | 34 180                        | -0.008%           | 169                        | 0.169%            | 406                        | -0.251%           |
| Transport and communication        | 25 643                        | 0.012%            | 3 900                      | 0.287%            | 1 550                      | -0.315%           |
| Other services                     | 52 321                        | 0.001%            | 1 882                      | 0.709%            | 1 850                      | -0.433%           |
| Finance, banking and insurance     | 30 492                        | -0.007%           | 201                        | 0.895%            | 492                        | -0.425%           |

Oil and gas industry exhibits the most significant decline in production (-0.17%). This change seems to be a demand shock, since we have a significant decrease in oil and gas exports to ACs (-4.6%). There is also a small effect on production in machinery and equipment, agriculture and forestry, construction and finance, banking and services. Overall effect on the Russian economy seems to be very small.

### **The Enlargement scenarios: Customs union between EU and AC (with NTMs.)**

The main difference of the next group of enlargement scenarios is introduction of NTMs in the model. We gradually introduce changes in the scenarios: enlargement-2 scenario is replication of the enlargement-1 with NTM. Accession does not result in changes in NTM, only tariff rates change in an accession process (Enl-2). Next step is to abolish NTMs in the EU customs union (NTMs between EU and AC are zero, but NMT towards other regions are on the benchmark levels).(Enl-3). The final experiment is to introduce a full customs union between EU and AC, setting all NTMs in the AC at the EU levels.

***Table 4-5 : Benchmark NTM levels by region.***

| <b>EU-15 NTM levels</b> | <b>Benchmark NTM levels</b> |                |                 |                 |
|-------------------------|-----------------------------|----------------|-----------------|-----------------|
|                         | <b>From Russia</b>          | <b>From AC</b> | <b>From CIS</b> | <b>From ROW</b> |
| Electricity and heat    | 0.00%                       | 0.00%          | 0.00%           | 0.00%           |

|                                    |        |        |        |         |
|------------------------------------|--------|--------|--------|---------|
| Oil and gas                        | 0.00%  | 0.00%  | 0.00%  | 127.06% |
| Other fuels                        | 0.00%  | 0.00%  | 0.00%  | 16.49%  |
| Ferrous metallurgy                 | 0.00%  | 0.00%  | 0.00%  | 48.65%  |
| Nonferrous metallurgy              | 0.00%  | 0.00%  | 0.00%  | 53.05%  |
| Chemical industry and oil refinery | 0.00%  | 0.94%  | 0.00%  | 103.69% |
| Machinery and equipment            | 0.00%  | 0.00%  | 0.00%  | 156.12% |
| Light industry                     | 0.00%  | 0.00%  | 0.00%  | 62.95%  |
| Food-processing industry           | 0.00%  | 0.00%  | 0.00%  | 56.05%  |
| Other industries                   | 0.00%  | 3.42%  | 0.00%  | 112.85% |
| Agriculture and forestry           | 0.00%  | 0.00%  | 0.00%  | 375.33% |
| Construction                       | 18.30% | 18.30% | 18.30% | 18.30%  |
| Transport and communication        | 0.00%  | 0.00%  | 0.00%  | 0.00%   |
| Other services                     | 0.00%  | 0.00%  | 46.92% | 71.32%  |
| Finance, banking and insurance     | 8.50%  | 8.50%  | 8.50%  | 8.50%   |

#### Benchmark NTM levels

| AC-10 NTM levels                   | From Russia | From EU | From CIS | From ROW |
|------------------------------------|-------------|---------|----------|----------|
| Electricity and heat               | 0.00%       | 0.00%   | 0.00%    | 0.00%    |
| Oil and gas                        | 0.00%       | 0.00%   | 0.00%    | 41.79%   |
| Other fuels                        | 0.00%       | 0.00%   | 0.00%    | 12.20%   |
| Ferrous metallurgy                 | 0.00%       | 0.00%   | 0.00%    | 66.72%   |
| Nonferrous metallurgy              | 0.00%       | 0.00%   | 0.00%    | 48.47%   |
| Chemical industry and oil refinery | 0.00%       | 0.00%   | 0.00%    | 107.56%  |
| Machinery and equipment            | 0.00%       | 0.00%   | 0.00%    | 124.02%  |
| Light industry                     | 0.00%       | 0.00%   | 0.00%    | 51.66%   |
| Food-processing industry           | 0.00%       | 6.44%   | 3.55%    | 45.83%   |
| Other industries                   | 0.00%       | 0.87%   | 0.00%    | 85.36%   |
| Agriculture and forestry           | 31.67%      | 0.00%   | 0.00%    | 301.04%  |
| Construction                       | 51.90%      | 51.90%  | 51.90%   | 51.90%   |
| Transport and communication        | 0.00%       | 0.00%   | 0.00%    | 0.00%    |
| Other services                     | 0.00%       | 0.00%   | 52.76%   | 65.59%   |
| Finance, banking and insurance     | 18.40%      | 18.40%  | 18.40%   | 18.40%   |

Levels of NTMs are very high in comparison with the MFN tariffs that goods faces on EU and AC markets. The result of elimination of tariff components of the trade protection between EU and AC and adoption of the EU common tariff by AC leads us the following changes in the overall trade. Figures in tables indicate percentage changes in trade flows to the benchmark equilibrium without the custom union.

***Table 4-6: Percentage change in total trade flows after Enlargement-2***

| Source Destination | RUS    | EU     | AC    | CIS    | ROW    |
|--------------------|--------|--------|-------|--------|--------|
| RUS                |        | -0.13% | 2.51% | -0.30% | -0.27% |
| EU                 | 0.16%  |        | 3.15% | -0.16% | -0.16% |
| AC                 | -1.18% | -2.52% |       | 1.97%  | -1.64% |
| CIS                | 0.32%  | 0.19%  | 3.43% |        | 0.02%  |
| ROW                | 0.29%  | 0.17%  | 3.35% | -0.01% |        |

**Table 4-7: Percentage change in total trade flows after Enlargement-3**

| Source<br>Destination | RUS    | EU     | AC    | CIS    | ROW    |
|-----------------------|--------|--------|-------|--------|--------|
| RUS                   |        | -0.16% | 2.46% | -0.31% | -0.29% |
| EU                    | 0.19%  |        | 3.65% | -0.14% | -0.16% |
| AC                    | -1.28% | -2.05% |       | 1.85%  | -1.77% |
| CIS                   | 0.33%  | 0.17%  | 3.41% |        | 0.01%  |
| ROW                   | 0.32%  | 0.16%  | 3.37% | 0.01%  |        |

**Table 4-8: Percentage change in total trade flows after Enlargement-4**

| Source<br>Destination | RUS    | EU     | AC     | CIS    | ROW    |
|-----------------------|--------|--------|--------|--------|--------|
| RUS                   |        | 1.17%  | -1.37% | 0.30%  | 1.61%  |
| EU                    | -1.27% |        | -2.43% | -0.93% | 0.54%  |
| AC                    | 6.46%  | 7.60%  |        | 9.81%  | -1.28% |
| CIS                   | -0.40% | 0.98%  | -2.10% |        | 1.57%  |
| ROW                   | -1.78% | -0.52% | -3.47% | -1.41% |        |

In scenarios Enl-2 and Enl-3 direction of changes is the same as in the Enlargement-1 scenario, though magnitude of changes is less which can be explained by remaining NTMs. There are differences in the trade flows in the Enl-4 scenario. These differences can be explained by the fact that estimated NTMs of the EU towards the rest of the world are huge.

Enlargement 4 is also the only scenario, where AC, Russia and the EU win from the accession. The gain for the AC is the largest, followed by the one for CIS, then Russia and the EU. Welfare of the rest of the world decreases slightly because of trade diversion.

EU enlargement-2

EU enlargement-3

EU enlargement-4

equivalent variations

equivalent variations

equivalent variations

|      |        |
|------|--------|
| RUS  | -0.019 |
| EU   | -0.015 |
| CEEC | -1.647 |
| CIS  | 0.077  |
| ROW  | 0.034  |

|      |        |
|------|--------|
| RUS  | -0.023 |
| EU   | -0.013 |
| CEEC | -1.687 |
| CIS  | 0.072  |
| ROW  | 0.034  |

|      |        |
|------|--------|
| RUS  | 0.202  |
| EU   | 0.103  |
| CEEC | 0.761  |
| CIS  | 0.376  |
| ROW  | -0.068 |

Russian economy changes in the following way:

**Table 4-9: Changes in Russian production and trade in scenarios Enl-2, Enl-3, Enl-4.**

| <b>Russian production</b>          | Enlargment-1<br>Percentage<br>change in<br>production | Enlargment-2<br>Percentage<br>change in<br>production | Enlargment-3<br>Percentage<br>change in<br>production | Enlargment-4<br>Percentage<br>change in<br>production |
|------------------------------------|---|---|---|---|
| Electricity and heat               | -0.009%   | -0.003%   | -0.004%   | 0.020%  |
| Oil and gas                        | -0.170%   | -0.131%   | -0.132%   | 0.037%  |
| Other fuels                        | 0.114%  | 0.037%  | 0.040%  | -0.265%   |
| Ferrous metallurgy                 | 0.335%  | 0.196%  | 0.203%  | -0.350%   |
| Nonferrous metallurgy              | 0.222%  | 0.098%  | 0.105%  | -0.401%   |
| Chemical industry and oil refinery | 0.140%  | 0.122%  | 0.123%  | 0.020%  |
| Machinery and equipment            | -0.051%   | 0.017%  | 0.013%  | 0.253%  |
| Light industry                     | 0.071%  | 0.068%  | 0.068%  | -0.024%   |
| Food-processing industry           | 0.028%  | 0.036%  | 0.035%  | 0.057%  |
| Other industries                   | 0.090%  | 0.053%  | 0.055%  | -0.090%   |
| Agriculture and forestry           | -0.005%   | 0.002%  | 0.001%  | 0.065%  |
| Construction                       | -0.008%   | -0.002%   | -0.003%   | 0.028%  |
| Transport and communication        | 0.012%  | -0.001%   | 0.000%  | -0.051%   |
| Other services                     | 0.001%  | 0.004%  | 0.004%  | 0.016%  |
| Finance, banking and insurance     | -0.007%   | -0.001%   | -0.002%   | 0.022%  |

| <b>Russian exports</b>             | Enlargment-1<br>Percentage<br>change in<br>exports | Enlargment-2<br>Percentage<br>change in<br>exports | Enlargment-3<br>Percentage<br>change in<br>exports | Enlargment-4<br>Percentage<br>change in<br>exports |
|------------------------------------|--|--|--|--|
| Electricity and heat               | -0.297%  | -0.320%  | -0.313%  | -0.394%  |
| Oil and gas                        | -0.505%  | -0.397%  | -0.401%  | 0.067%   |
| Other fuels                        | 0.335%   | 0.107%   | 0.119%   | -0.791%  |
| Ferrous metallurgy                 | 0.475%   | 0.277%   | 0.287%   | -0.500%  |
| Nonferrous metallurgy              | 0.427%   | 0.186%   | 0.201%   | -0.779%  |
| Chemical industry and oil refinery | 0.414%   | 0.345%   | 0.349%   | -0.018%  |
| Machinery and equipment            | -0.072%  | 0.118%   | 0.110%   | 0.673%   |
| Light industry                     | 0.895%   | 0.815%   | 0.821%   | -0.428%  |
| Food-processing industry           | 1.560%   | 1.465%   | 1.472%   | 0.747%   |
| Other industries                   | 0.466%   | 0.252%   | 0.264%   | -0.581%  |
| Agriculture and forestry           | 1.424%   | 0.884%   | 0.897%   | 2.899%   |
| Construction                       | 0.169%   | -0.122%  | -0.105%  | 0.861%   |
| Transport and communication        | 0.287%   | 0.022%   | 0.038%   | -1.019%  |
| Other services                     | 0.709%   | 0.402%   | 0.419%   | -0.792%  |
| Finance, banking and insurance     | 0.895%   | 0.414%   | 0.436%   | -1.203%  |

| <b>Russian imports</b>             | Enlargment-1<br>Percentage<br>change in<br>imports | Enlargment-2<br>Percentage<br>change in<br>imports | Enlargment-3<br>Percentage<br>change in<br>imports | Enlargment-4<br>Percentage<br>change in<br>imports |
|------------------------------------|--|--|--|--|
| Electricity and heat               | 2.669%   | 1.874%   | 1.894%   | -1.070%  |
| Oil and gas                        | -0.323%  | -0.133%  | -0.146%  | 0.685%   |
| Other fuels                        | -0.226%  | -0.119%  | -0.125%  | 0.343%   |
| Ferrous metallurgy                 | -0.505%  | -0.321%  | -0.332%  | 0.452%   |
| Nonferrous metallurgy              | -0.571%  | -0.201%  | -0.225%  | 1.286%   |
| Chemical industry and oil refinery | -0.426%  | -0.103%  | -0.128%  | 1.217%   |
| Machinery and equipment            | -0.383%  | -0.094%  | -0.114%  | 1.100%   |
| Light industry                     | -0.580%  | -0.170%  | -0.195%  | 1.496%   |
| Food-processing industry           | -0.503%  | -0.138%  | -0.164%  | 1.331%   |

|                                |         |         |         |        |
|--------------------------------|---------|---------|---------|--------|
| Other industries               | -0.129% | 0.121%  | 0.075%  | 1.132% |
| Agriculture and forestry       | -0.496% | -0.197% | -0.213% | 0.980% |
| Construction                   | -0.251% | -0.011% | -0.032% | 0.960% |
| Transport and communication    | -0.315% | -0.055% | -0.073% | 0.987% |
| Other services                 | -0.433% | -0.133% | -0.150% | 1.069% |
| Finance, banking and insurance | -0.425% | -0.166% | -0.180% | 0.881% |

The structural changes in the Russian economy in scenarios Enlargement 2-3 are very similar to the scenario Enlargement 1. In Enlargement 4 scenario Russia increases its production of oil and gas, and, quite strangely, production of machinery and equipment. Export of these two goods also goes up. Interestingly, export of agricultural goods from Russia increases in the Enlargement 4 scenario. The EU NTM against agricultural goods from the rest of the world are higher than the AC once, so Russia may increase its agricultural export because of trade diversion from the rest of the world.

The results of the experiments suggest that taking NTMs into consideration is very important for analyzing the consequences of the enlargement process. The quantitative results may look very different and even reversed if NMT are taken into account. Our model does not take into consideration the fact that WTO countries are eligible for compensations from the EU if their trade conditions deteriorated after the accession. Still in order to understand the effects of the EU accession on non-WTO countries, to which most of the CIS countries still belong, one has to take non-trade barriers into consideration.



## 5. Russia's WTO accession

As in the previous case, we estimate several WTO accession scenarios, which include and do not include NTM. In the first scenario tariff equivalents of NTMs are not included in the model at all (WTO-1 scenario). Russia unilaterally reduces its tariff rates to the final binding level, proposed in its tariff offer. We use the tariff offer published on [www.wto.ru](http://www.wto.ru). Some of the binding levels in this offer are higher than the current tariffs, and we leave these tariff lines unchanged. The second scenario introduces NTMs in all regions and models Russia's accession as tariff barriers decrease while non tariff measures do not change (WTO-2). In the last experiment Russia reduces its tariff to the proposed levels and cuts the NTMs by half. Reduction of NTMs may reflect the effects of changes both in Russian legislation and effective trade policy as a result of introduction of WTO and GATS rules.

There is a number of papers that have already tried to use CGE approach to estimate the effect of Russia's WTO accession. The most comprehensive is the paper by Jensen, Rutherford and Tarr [8]. The model, used in this paper, allows for inclusion of increasing return to scale sectors. It estimates the overall gains to the Russian economy in the short run of 7.4% of consumption, most of which originates because of complete liberalization of trade in services. We should also note that this paper does not use Russian tariff offer, and simply models WTO accession and decrease of all tariff lines in half. We should say right away that Russian welfare gains in our model are much smaller than in the Jensen et al. paper; they vary from 0.007% in WTO-1 scenario to 0.049% in WTO-3. The difference can be explained both by the use of a difference accession scenario, and by absence of increasing return to scale sectors in our model. One more source of differences is terms of trade effect. This effect is absent from the Jensen et al. model, because Russia is modeled there as a small open economy.

WTO1

WTO2

WTO3

equivalent variations    equivalent variations    equivalent variations

|      |        |      |        |      |        |
|------|--------|------|--------|------|--------|
| RUS  | 0.007  | RUS  | 0.007  | RUS  | 0.049  |
| EU   | 0.003  | EU   | 0.002  | EU   | 0.003  |
| CEEC | -0.007 | CEEC | -0.100 | CEEC | -0.095 |
| CIS  | 0.215  | CIS  | 0.229  | CIS  | 0.222  |
| ROW  | -0.001 | ROW  | 0.000  | ROW  | 0.000  |

## The WTO-1 scenario: Russia's accession to the WTO (no NTMs.)

Table 4-1 gives information on proposed changes in Russian tariff level after the accession. The proposed decline is usually quite small, so we should not expect large effects on any region.

***Table 5-1: Russian benchmark tariff levels and WTO proposal.***

| Russian tariff levels on goods from | Benchmark tariff levels |        |        |        | Russian WTO proposal |
|-------------------------------------|-------------------------|--------|--------|--------|----------------------|
|                                     | EU                      | AC     | CIS    | ROW    |                      |
| Electricity and heat                | 5.21%                   | 0.00%  | 5.31%  | 5.30%  | 5.00%                |
| Oil and gas                         | 5.28%                   | 5.29%  | 5.27%  | 5.28%  | 5.00%                |
| Other fuels                         | 5.24%                   | 5.17%  | 5.26%  | 5.26%  | 5.00%                |
| Ferrous metallurgy                  | 10.38%                  | 12.47% | 7.79%  | 9.54%  | 8.00%                |
| Nonferrous metallurgy               | 9.92%                   | 12.42% | 6.72%  | 9.81%  | 9.00%                |
| Chemical industry and oil refinery  | 9.12%                   | 11.17% | 11.82% | 9.61%  | 7.00%                |
| Machinery and equipment             | 10.51%                  | 11.87% | 12.05% | 11.11% | 9.00%                |
| Light industry                      | 15.40%                  | 12.82% | 30.98% | 20.99% | 14.00%               |
| Food-processing industry            | 13.77%                  | 16.98% | 25.88% | 9.21%  | 9.00%                |
| Other industries                    | 10.80%                  | 10.88% | 15.03% | 11.15% | 10.00%               |
| Agriculture and forestry            | 5.30%                   | 5.38%  | 5.80%  | 5.22%  | 5.00%                |
| Construction                        | 0.00%                   | 0.00%  | 0.00%  | 0.00%  | 0.00%                |
| Transport and communication         | 0.00%                   | 0.00%  | 0.00%  | 0.00%  | 0.00%                |
| Other services                      | 10.33%                  | 12.98% | 22.94% | 13.35% | 0.00%                |
| Finance, banking and insurance      | 0.00%                   | 0.00%  | 0.00%  | 0.00%  | 0.00%                |

As a result of the accession, both Russian export and import increase, and its terms of trade also increase. There is a slight decrease of export of the CIS countries.

***Table 5-2: Percentage change in total trade flows after WTO-2***

| Source<br>Destination | RUS   | EU     | AC    | CIS    | ROW    |
|-----------------------|-------|--------|-------|--------|--------|
| RUS                   |       | 1.07%  | 1.54% | 1.45%  | 0.76%  |
| EU                    | 0.38% |        | 0.01% | -0.47% | 0.01%  |
| AC                    | 0.36% | -0.03% |       | -0.47% | -0.01% |
| CIS                   | 0.93% | 0.54%  | 0.55% |        | 0.55%  |
| ROW                   | 0.36% | -0.01% | 0.00% | -0.44% |        |

***Table 5-3: Terms of trade effect after WTO-1***

|     |                       | EU<br>Enlargement-4 | WTO-1        | Percentage<br>Change |
|-----|-----------------------|---------------------|--------------|----------------------|
| RUS | price of export       | 1.122               | 1.117        | -0.40%               |
|     | price of import       | 1.153               | 1.129        | -2.08%               |
|     | <b>Terms of Trade</b> | <b>0.973</b>        | <b>0.990</b> | <b>1.71%</b>         |
| EU  | price of export       | 1.129               | 1.129        | -0.01%               |
|     | price of import       | 1.123               | 1.123        | -0.01%               |
|     | <b>Terms of Trade</b> | <b>1.005</b>        | <b>1.005</b> | <b>0.00%</b>         |

|     |                       |              |              |               |
|-----|-----------------------|--------------|--------------|---------------|
| ACs | price of export       | 1.071        | 1.070        | -0.04%        |
|     | price of import       | 1.129        | 1.129        | -0.02%        |
|     | <b>Terms of Trade</b> | <b>0.948</b> | <b>0.948</b> | <b>-0.02%</b> |
| CIS | price of export       | 1.140        | 1.136        | -0.39%        |
|     | price of import       | 1.172        | 1.171        | -0.10%        |
|     | <b>Terms of Trade</b> | <b>0.973</b> | <b>0.970</b> | <b>-0.29%</b> |
| ROW | price of export       | 1.128        | 1.127        | -0.02%        |
|     | price of import       | 1.127        | 1.127        | 0.00%         |
|     | <b>Terms of Trade</b> | <b>1.001</b> | <b>1.001</b> | <b>-0.02%</b> |

***Table 5-4: Terms of trade effect after WTO-1***

|     |                       | EU<br>Enlargement-4 | WTO-1        | Percentage<br>Change |
|-----|-----------------------|---------------------|--------------|----------------------|
| RUS | price of export       | 1.122               | 1.117        | -0.40%               |
|     | price of import       | 1.153               | 1.129        | -2.08%               |
|     | <b>Terms of Trade</b> | <b>0.973</b>        | <b>0.990</b> | <b>1.71%</b>         |
| EU  | price of export       | 1.129               | 1.129        | -0.01%               |
|     | price of import       | 1.123               | 1.123        | -0.01%               |
|     | <b>Terms of Trade</b> | <b>1.005</b>        | <b>1.005</b> | <b>0.00%</b>         |
| ACs | price of export       | 1.071               | 1.070        | -0.04%               |
|     | price of import       | 1.129               | 1.129        | -0.02%               |
|     | <b>Terms of Trade</b> | <b>0.948</b>        | <b>0.948</b> | <b>-0.02%</b>        |
| CIS | price of export       | 1.140               | 1.136        | -0.39%               |
|     | price of import       | 1.172               | 1.171        | -0.10%               |
|     | <b>Terms of Trade</b> | <b>0.973</b>        | <b>0.970</b> | <b>-0.29%</b>        |
| ROW | price of export       | 1.128               | 1.127        | -0.02%               |
|     | price of import       | 1.127               | 1.127        | 0.00%                |
|     | <b>Terms of Trade</b> | <b>1.001</b>        | <b>1.001</b> | <b>-0.02%</b>        |

Production of most Russian manufacturing sectors goes up, while production of services goes down. Interestingly, export of all goods and services goes up. Surprisingly, import of services goes down. As far as import of goods is concerned, quite naturally import of manufacturing goods increases even further, while imports in the traditional Russian exporting sectors goes down.

***Table 5-5: Changes in Russian production and trade after WTO-1.***

| Russian WTO accession<br>(WTO-1)      | Benchmark<br>production,<br>mln USD | Percentage<br>change | Benchmark<br>exports,<br>mln USD | Percentage<br>change | Benchmark<br>imports,<br>mln USD | Percentage<br>change |
|---------------------------------------|-------------------------------------|----------------------|----------------------------------|----------------------|----------------------------------|----------------------|
| Electricity and heat                  | 14478.0                             | -0.1023%             | 137.8                            | 0.6958%              | 10.5                             | -0.7360%             |
| Oil and gas                           | 91188.4                             | 0.0589%              | 44542.1                          | 0.4068%              | 1031.3                           | -0.8227%             |
| Other fuels                           | 4339.9                              | 0.0859%              | 2278.4                           | 0.4365%              | 85.5                             | -0.7569%             |
| Ferrous metallurgy                    | 17353.8                             | 0.1867%              | 14469.4                          | 0.3025%              | 3620.2                           | -0.3425%             |
| Nonferrous metallurgy                 | 24018.3                             | 0.1255%              | 16705.0                          | 0.3270%              | 768.5                            | -0.1306%             |
| Chemical industry and oil<br>refinery | 16863.5                             | 0.0958%              | 8890.0                           | 0.4038%              | 4037.9                           | 1.6638%              |

|                                |         |          |         |         |         |          |
|--------------------------------|---------|----------|---------|---------|---------|----------|
| Machinery and equipment        | 36818.0 | 0.0907%  | 12642.2 | 0.4790% | 15064.4 | 0.7625%  |
| Light industry                 | 4930.6  | -0.0704% | 779.1   | 0.5916% | 1179.8  | 4.6829%  |
| Food-processing industry       | 45248.8 | -0.0622% | 2377.0  | 0.6675% | 8305.4  | 1.7247%  |
| Other industries               | 24761.1 | 0.0202%  | 8562.7  | 0.4663% | 5758.8  | 0.2506%  |
| Agriculture and forestry       | 30852.6 | -0.1090% | 518.3   | 0.6480% | 2594.5  | -0.5878% |
| Construction                   | 34177.5 | -0.1055% | 169.4   | 0.5773% | 405.3   | -0.4987% |
| Transport and communication    | 25646.4 | -0.0502% | 3911.2  | 0.6394% | 1545.5  | -0.5478% |
| Other services                 | 52321.0 | -0.0263% | 1895.3  | 0.5133% | 1842.2  | 7.3045%  |
| Finance, banking and insurance | 30489.8 | -0.1052% | 202.8   | 0.6194% | 489.7   | -0.5029% |

### Russia's WTO accession scenarios with NTMs

As one can see from the Table 3-5, estimated Russian NTM toward other countries are not that difficult for most goods and services, so their inclusion in the model does not alter the results significantly. The WTO-3 scenario, which envisages cut in non-trade barriers, produces the highest welfare gain for Russia. This result can be used as an indirect confirmation of the hypothesis that most of the effects of WTO accession on Russian economy will come from changes in legislation and other measure, not directly related to tariff decrease.

**Table 5-6 : Benchmark Russian NTMs**

| Russian NTM levels on goods from   | Benchmark tariff levels |        |        |        |
|------------------------------------|-------------------------|--------|--------|--------|
|                                    | EU                      | AC     | CIS    | ROW    |
| Electricity and heat               | 66.34%                  | 0.00%  | 0.00%  | 0.00%  |
| Oil and gas                        | 0.00%                   | 0.00%  | 0.00%  | 10.52% |
| Other fuels                        | 0.00%                   | 1.58%  | 0.00%  | 0.00%  |
| Ferrous metallurgy                 | 0.00%                   | 11.14% | 0.00%  | 0.00%  |
| Nonferrous metallurgy              | 0.27%                   | 0.28%  | 0.00%  | 5.88%  |
| Chemical industry and oil refinery | 0.00%                   | 0.00%  | 0.00%  | 5.96%  |
| Machinery and equipment            | 0.00%                   | 0.00%  | 0.00%  | 15.47% |
| Light industry                     | 10.47%                  | 8.78%  | 0.00%  | 15.51% |
| Food-processing industry           | 0.00%                   | 0.00%  | 0.00%  | 1.49%  |
| Other industries                   | 0.00%                   | 0.00%  | 0.00%  | 11.73% |
| Agriculture and forestry           | 0.00%                   | 0.00%  | 0.00%  | 0.00%  |
| Construction                       | 51.90%                  | 51.90% | 51.90% | 51.90% |
| Transport and communication        | 0.00%                   | 0.00%  | 0.00%  | 0.00%  |
| Other services                     | 0.00%                   | 0.00%  | 0.00%  | 0.00%  |
| Finance, banking and insurance     | 18.40%                  | 18.40% | 18.40% | 18.40% |

**Table 5-7: Percentage change in total trade flows after WTO-2**

| Source<br>Destination | RUS   | EU     | AC    | CIS    | ROW    |
|-----------------------|-------|--------|-------|--------|--------|
| RUS                   |       | 1.06%  | 1.59% | 1.46%  | 0.66%  |
| EU                    | 0.39% |        | 0.10% | -0.46% | 0.00%  |
| AC                    | 0.24% | -0.16% |       | -0.59% | -0.15% |
| CIS                   | 0.93% | 0.53%  | 0.62% |        | 0.53%  |
| ROW                   | 0.38% | 0.00%  | 0.10% | -0.42% |        |

***Table 5-8: Percentage change in total trade flows after WTO-3***

| Source<br>Destination | RUS   | EU     | AC    | CIS    | ROW    |
|-----------------------|-------|--------|-------|--------|--------|
| RUS                   |       | 0.95%  | 1.58% | 1.25%  | 2.69%  |
| EU                    | 0.68% |        | 0.10% | -0.38% | 0.00%  |
| AC                    | 0.53% | -0.16% |       | -0.49% | -0.16% |
| CIS                   | 1.15% | 0.45%  | 0.55% |        | 0.45%  |
| ROW                   | 0.66% | 0.00%  | 0.10% | -0.33% |        |

***Table 5-9: Changes in Russian production and trade in scenarios WTO-2, WTO-3.***

| Russian production                 | WTO-1<br>Percentage<br>change in<br>production | WTO-2<br>Percentage<br>change in<br>production | WTO-3<br>Percentage<br>change in<br>production |
|------------------------------------|--|--|--|
| Electricity and heat               | -0.10%   | -0.10%   | -0.18%   |
| Oil and gas                        | 0.06%  | 0.06%  | 0.10%  |
| Other fuels                        | 0.09%  | 0.09%  | 0.14%  |
| Ferrous metallurgy                 | 0.19%  | 0.19%  | 0.32%  |
| Nonferrous metallurgy              | 0.13%  | 0.13%  | 0.22%  |
| Chemical industry and oil refinery | 0.10%  | 0.09%  | 0.15%  |
| Machinery and equipment            | 0.09%  | 0.08%  | 0.20%  |
| Light industry                     | -0.07%   | -0.07%   | -0.13%   |
| Food-processing industry           | -0.06%   | -0.06%   | -0.13%   |
| Other industries                   | 0.02%  | 0.02%  | 0.05%  |
| Agriculture and forestry           | -0.11%   | -0.11%   | -0.19%   |
| Construction                       | -0.11%   | -0.10%   | -0.13%   |
| Transport and communication        | -0.05%   | -0.05%   | -0.09%   |
| Other services                     | -0.03%   | -0.02%   | -0.10%   |
| Finance, banking and insurance     | -0.11%   | -0.10%   | -0.16%   |

| Russian exports                    | WTO-1<br>Percentage<br>change in<br>exports | WTO-2<br>Percentage<br>change in<br>exports | WTO-3<br>Percentage<br>change in<br>exports |
|------------------------------------|---|---|---|
| Electricity and heat               | 0.70%                                       | 0.68%                                       | 1.09%                                       |
| Oil and gas                        | 0.41%                                       | 0.39%                                       | 0.69%                                       |
| Other fuels                        | 0.44%                                       | 0.44%                                       | 0.73%                                       |
| Ferrous metallurgy                 | 0.30%                                       | 0.31%                                       | 0.52%                                       |
| Nonferrous metallurgy              | 0.33%                                       | 0.33%                                       | 0.58%                                       |
| Chemical industry and oil refinery | 0.40%                                       | 0.40%                                       | 0.68%                                       |
| Machinery and equipment            | 0.48%                                       | 0.46%                                       | 0.67%                                       |
| Light industry                     | 0.59%                                       | 0.59%                                       | 0.98%                                       |
| Food-processing industry           | 0.67%                                       | 0.66%                                       | 1.05%                                       |
| Other industries                   | 0.47%                                       | 0.47%                                       | 0.79%                                       |
| Agriculture and forestry           | 0.65%                                       | 0.64%                                       | 1.06%                                       |
| Construction                       | 0.58%                                       | 0.58%                                       | 0.95%                                       |
| Transport and communication        | 0.64%                                       | 0.64%                                       | 1.02%                                       |
| Other services                     | 0.51%                                       | 0.52%                                       | 0.93%                                       |

|                                |       |       |       |
|--------------------------------|-------|-------|-------|
| Finance, banking and insurance | 0.62% | 0.63% | 1.03% |
|--------------------------------|-------|-------|-------|

| <b>Russian imports</b>             | WTO-1<br>Percentage<br>change in<br>imports | WTO-2<br>Percentage<br>change in<br>imports | WTO-3<br>Percentage<br>change in<br>imports |
|------------------------------------|---|---|---|
| Electricity and heat               | -0.74%                                      | -0.67%                                      | -0.92%                                      |
| Oil and gas                        | -0.82%                                      | -0.82%                                      | -0.66%                                      |
| Other fuels                        | -0.76%                                      | -0.75%                                      | -1.08%                                      |
| Ferrous metallurgy                 | -0.34%                                      | -0.34%                                      | -0.69%                                      |
| Nonferrous metallurgy              | -0.13%                                      | -0.15%                                      | 0.12%                                       |
| Chemical industry and oil refinery | 1.66%                                       | 1.60%                                       | 2.12%                                       |
| Machinery and equipment            | 0.76%                                       | 0.70%                                       | 2.19%                                       |
| Light industry                     | 4.68%                                       | 4.29%                                       | 8.29%                                       |
| Food-processing industry           | 1.72%                                       | 1.69%                                       | 1.44%                                       |
| Other industries                   | 0.25%                                       | 0.22%                                       | 1.54%                                       |
| Agriculture and forestry           | -0.59%                                      | -0.59%                                      | -0.95%                                      |
| Construction                       | -0.50%                                      | -0.50%                                      | 11.04%                                      |
| Transport and communication        | -0.55%                                      | -0.55%                                      | -0.92%                                      |
| Other services                     | 7.30%                                       | 7.29%                                       | 6.91%                                       |
| Finance, banking and insurance     | -0.50%                                      | -0.51%                                      | 3.53%                                       |

## **6. Free Trade Area between Russia and the EU-25**

Until recently only a few papers made an attempt to estimate the effect of creation of FTA between Russia and the enlarged EU. Most of these papers, such as Samson and Greffe [14] employ, Vihhas de Souza [16] and Sulamaa and Widgren [17] use GTAP model. An important drawback of this model is that it does not include Russia as a separate region, but incorporates it in the region “countries of the Former Soviet Union”. Therefore the results of these papers should be interpreted carefully. Usually they show that creation of such FTA is beneficial for Russia, but is damaging at least for some European countries. Improvements in productivity of Russian firms can largely increase the gains from integration in the case of Russia-EU FTA. Additionally, the paper by Paul Brenton and John Whalley [3] on the economic impact of a free trade agreement between Russia and the EU. It suggests that a free trade agreement has a positive impact on Russian economy and generates significant changes in the volumes of Russian imports and exports.

There is no agreement yet on the question whether creation of a free trade area improves or worsen welfare of the members of this new FTA. Theory distinguishes between different possible welfare effects of creation of a free trade area. Since FTA gives preferential treatment to member countries, it diverts trade from non-member, least-cost suppliers. Trade diversion can dominate trade creation, so the FTA will reduce welfare in member countries.

Another important point that actually takes place in case of our analysis is that the liberalizing country loses because it foregoes tariff revenue from the new union member but does not gain in terms of lower domestic price on imports. And even higher intensity of trade with the other members of this trade union does not overwhelm the loses in tariff revenues.

Robinson [12] examines possible effects of diminution of tariffs as a result of regional trade agreements on welfare of members of these agreements. He shows both empirical evidence and theoretical base for the fact that both outcomes are possible he argues that trade creation exceeds trade diversion in almost all regional trade agreements. He also provides a detailed and full literature review on the subject of possible effects of trade agreements.

Currently there is no final agreement on how the Common Economic space between Russia and the EU will look like. In the near future it will most probably not involve creation of a FTA of any sort. Both the EU and Russia declare that they think that Russia should harmonize some of its legislation with the one of the EU, but both of them are quite skeptical

as far as the idea of FTA is concerned. Despite that, in this section of the paper we decided to estimate the potential effect of creation of FTA. It is important to notice that we modeled free trade area with the EU-25. The benchmark equilibrium in this scenario is the enlargement equilibrium Enl-4.

### **The FTA-EU-1 scenario: FTA between Russia and EU (no NTMs.)**

This scenario does not take NTM into consideration, so its results are directly comparable to the results from other work on this issue. As it can be seen from Table 5-1 creation of FTA between Russia and EU 25 leads to trade diversion with CIS and rest of the world. Export of accession countries to Russia goes up, while its export to other regions decreases slightly. Russia experience substantial increase in terms of trade, while terms of trade of other countries decline. Welfare in Russia, EU and AC goes up, while welfare of CIS and ROW goes down. Russia experiences the largest rise in welfare, followed by the AC. Russian industrial production goes up almost everywhere, and Russian export goes up as well. Interestingly, import of manufacturing goods to Russia also goes up.

Taking NTB into consideration changes the results slightly. Dropping tariff barriers between Russia and the EU-25 in this case only improves Russia's welfare by a margin, while welfare of other countries decline. When NTM decline, Russian and EU welfare increases even more than in the FTA-EU-1 scenario, however, the AC welfare goes down. This happens because of larger terms of trade decline for the AC countries in this scenario.

***Table 6-1: Percentage change in total trade flows after FTA-EU-1***

| Source<br>Destination | RUS   | EU     | AC     | CIS    | ROW    |
|-----------------------|-------|--------|--------|--------|--------|
| RUS                   |       | 6.62%  | 7.29%  | -0.62% | -0.72% |
| EU                    | 1.03% |        | -0.03% | 0.28%  | 0.05%  |
| AC                    | 0.66% | 0.01%  |        | 0.32%  | 0.06%  |
| CIS                   | 0.37% | -0.29% | -0.32% |        | -0.23% |
| ROW                   | 0.56% | -0.05% | -0.07% | 0.22%  |        |

***Table 6-2: Terms of trade effect after FTA-EU-1***

|     |                       | EU<br>Enlargement-4 | EU-FTA-1     | Percentage<br>Change |
|-----|-----------------------|---------------------|--------------|----------------------|
| RUS | price of export       | 1.122               | 1.113        | -0.77%               |
|     | price of import       | 1.153               | 1.108        | -3.89%               |
|     | <b>Terms of Trade</b> | <b>0.973</b>        | <b>1.005</b> | <b>3.24%</b>         |
| EU  | price of export       | 1.129               | 1.129        | -0.03%               |



|            |                       |              |              |               |
|------------|-----------------------|--------------|--------------|---------------|
|            | price of import       | 1.123        | 1.123        | -0.02%        |
|            | <b>Terms of Trade</b> | <b>1.005</b> | <b>1.005</b> | <b>-0.01%</b> |
| <b>AC</b>  | price of export       | 1.071        | 1.070        | -0.05%        |
|            | price of import       | 1.129        | 1.129        | -0.02%        |
|            | <b>Terms of Trade</b> | <b>0.948</b> | <b>0.948</b> | <b>-0.03%</b> |
| <b>CIS</b> | price of export       | 1.140        | 1.137        | -0.27%        |
|            | price of import       | 1.172        | 1.170        | -0.15%        |
|            | <b>Terms of Trade</b> | <b>0.973</b> | <b>0.972</b> | <b>-0.12%</b> |
| <b>ROW</b> | price of export       | 1.128        | 1.127        | 0.00%         |
|            | price of import       | 1.127        | 1.127        | 0.03%         |
|            | <b>Terms of Trade</b> | <b>1.001</b> | <b>1.000</b> | <b>-0.04%</b> |

***Table 6-3: Changes in Russian production and trade after FTA-EU-1.***

| <b>FTA between Russia and EY (EU-FTA-1)</b> | Benchmark production, mln USD | Percentage change | Benchmark exports, mln USD | Percentage change | Benchmark imports, mln USD | Percentage change |
|---|-------------------------------|-------------------|----------------------------|-------------------|----------------------------|-------------------|
| Electricity and heat                        | 14,478                        | -0.18%            | 137.82                     | 0.88%             | 10.462                     | -0.87%            |
| Oil and gas                                 | 91,188                        | 0.09%             | 44542.148                  | 0.66%             | 1031.281                   | -0.44%            |
| Other fuels                                 | 4,340                         | 0.10%             | 2278.432                   | 0.60%             | 85.476                     | -0.64%            |
| Ferrous metallurgy                          | 17,354                        | 0.27%             | 14469.44                   | 0.44%             | 3620.213                   | 0.28%             |
| Nonferrous metallurgy                       | 24,018                        | 0.37%             | 16704.996                  | 0.83%             | 768.473                    | 2.11%             |
| Chemical industry and oil refinery          | 16,863                        | 0.17%             | 8889.991                   | 0.73%             | 4037.861                   | 2.00%             |
| Machinery and equipment                     | 36,818                        | 0.22%             | 12642.158                  | 0.69%             | 15064.446                  | 2.73%             |
| Light industry                              | 4,931                         | 0.09%             | 779.05                     | 3.18%             | 1179.822                   | 2.91%             |
| Food-processing industry                    | 45,249                        | -0.10%            | 2376.985                   | 1.35%             | 8305.435                   | 2.88%             |
| Other industries                            | 24,761                        | 0.05%             | 8562.702                   | 0.67%             | 5758.78                    | 3.70%             |
| Agriculture and forestry                    | 30,853                        | -0.18%            | 518.348                    | 0.88%             | 2594.54                    | -0.32%            |
| Construction                                | 34,177                        | -0.18%            | 169.396                    | 0.92%             | 405.252                    | -0.79%            |
| Transport and communication                 | 25,646                        | -0.11%            | 3911.181                   | 0.79%             | 1545.464                   | -0.81%            |
| Other services                              | 52,321                        | -0.15%            | 1895.313                   | 0.88%             | 1842.212                   | 0.95%             |
| Finance, banking and insurance              | 30,490                        | -0.18%            | 202.789                    | 0.88%             | 489.719                    | -0.67%            |

## Effects of the FTA between Russian and the EU accounting for NTMs

***Table 6-4: Percentage change in total trade flows after FTA-EU-2***

| Source<br>Destination | RUS    | EU     | AC    | CIS    | ROW    |
|-----------------------|--------|--------|-------|--------|--------|
| RUS                   |        | 0.34%  | 0.70% | -0.04% | -0.08% |
| EU                    | 0.09%  |        | 0.10% | 0.03%  | -0.01% |
| AC                    | -0.08% | -0.16% |       | -0.13% | -0.17% |
| CIS                   | 0.03%  | -0.03% | 0.07% |        | -0.04% |
| ROW                   | 0.07%  | 0.01%  | 0.11% | 0.04%  |        |

***Table 6-5: Percentage change in total trade flows after FTA-EU--3***

| Source<br>Destination | RUS   | EU     | AC     | CIS    | ROW    |
|-----------------------|-------|--------|--------|--------|--------|
| RUS                   |       | 7.03%  | 8.04%  | -0.62% | -0.76% |
| EU                    | 1.06% |        | 0.07%  | 0.30%  | 0.05%  |
| AC                    | 0.85% | -0.16% |        | 0.17%  | -0.11% |
| CIS                   | 0.35% | -0.30% | -0.23% |        | -0.25% |
| ROW                   | 0.57% | -0.04% | 0.04%  | 0.25%  |        |

**Table 6-6: Changes in Russian production and trade in scenarios FTA-EU--2, FTA-EU--3.**

| Russian production                 | FTA-EU-1<br>Percent<br>change in<br>production | FTA-EU-2<br>Percent<br>change in<br>production | FTA-EU-3<br>Percent<br>change in<br>production |
|------------------------------------|--|--|--|
| Electricity and heat               | -0.18%   | -0.01%   | -0.19%   |
| Oil and gas                        | 0.09%  | 0.00%  | 0.08%  |
| Other fuels                        | 0.10%  | 0.01%  | 0.09%  |
| Ferrous metallurgy                 | 0.27%  | 0.02%  | 0.27%  |
| Nonferrous metallurgy              | 0.37%  | 0.02%  | 0.38%  |
| Chemical industry and oil refinery | 0.17%  | 0.00%  | 0.20%  |
| Machinery and equipment            | 0.22%  | -0.01%   | 0.25%  |
| Light industry                     | 0.09%  | -0.02%   | 0.15%  |
| Food-processing industry           | -0.10%   | -0.01%   | -0.11%   |
| Other industries                   | 0.05%  | 0.00%  | 0.04%  |
| Agriculture and forestry           | -0.18%   | -0.01%   | -0.19%   |
| Construction                       | -0.18%   | 0.04%  | -0.14%   |
| Transport and communication        | -0.11%   | -0.01%   | -0.12%   |
| Other services                     | -0.15%   | -0.01%   | -0.16%   |
| Finance, banking and insurance     | -0.18%   | 0.00%  | -0.18%   |

| Russian exports                    | FTA-EU -1<br>Percent<br>change in<br>exports | FTA-EU -2<br>Percent<br>change in<br>exports | FTA-EU-3<br>Percent<br>change in<br>exports |
|------------------------------------|--|--|---|
| Electricity and heat               | -0.87%                                       | 0.42%  | -0.39%                                      |
| Oil and gas                        | -0.44%                                       | -0.06%                                       | -0.45%                                      |
| Other fuels                        | -0.64%                                       | -0.02%                                       | -0.63%                                      |
| Ferrous metallurgy                 | 0.28%  | 0.03%  | 0.36%                                       |
| Nonferrous metallurgy              | 2.11%  | -0.08%                                       | 2.08%                                       |
| Chemical industry and oil refinery | 2.00%  | -0.08%                                       | 1.95%                                       |
| Machinery and equipment            | 2.73%  | -0.07%                                       | 2.67%                                       |
| Light industry                     | 2.91%  | 2.25%  | 5.48%                                       |
| Food-processing industry           | 2.88%  | -0.08%                                       | 2.82%                                       |
| Other industries                   | 3.70%  | -0.07%                                       | 3.64%                                       |
| Agriculture and forestry           | -0.32%                                       | -0.06%                                       | -0.34%                                      |
| Construction                       | -0.79%                                       | 9.88%  | 9.06%                                       |
| Transport and communication        | -0.81%                                       | -0.06%                                       | -0.83%                                      |
| Other services                     | 0.95%  | -0.06%                                       | 0.92%                                       |
| Finance, banking and insurance     | -0.67%                                       | 1.68%  | 1.03%                                       |

| <b>Russian imports</b>             | <b>FTA-EU-1<br/>Percent<br/>change in<br/>imports</b> | <b>FTA-EU-2<br/>Percent<br/>change in<br/>imports</b> | <b>FTA-EU-3<br/>Percent<br/>change in<br/>imports</b> |
|------------------------------------|---|---|---|
| Electricity and heat               | 0.88%   | 0.04%   | 0.86%   |
| Oil and gas                        | 0.66%   | 0.02%   | 0.63%   |
| Other fuels                        | 0.60%   | 0.05%   | 0.61%   |
| Ferrous metallurgy                 | 0.44%   | 0.03%   | 0.44%   |
| Nonferrous metallurgy              | 0.83%   | 0.04%   | 0.87%   |
| Chemical industry and oil refinery | 0.73%   | 0.03%   | 0.83%   |
| Machinery and equipment            | 0.69%   | 0.02%   | 0.87%   |
| Light industry                     | 3.18%   | 0.06%   | 4.13%   |
| Food-processing industry           | 1.35%   | 0.05%   | 1.69%   |
| Other industries                   | 0.67%   | 0.05%   | 0.67%   |
| Agriculture and forestry           | 0.88%   | 0.05%   | 0.87%   |
| Construction                       | 0.92%   | 7.22%   | 8.14%   |
| Transport and communication        | 0.79%   | 0.06%   | 0.79%   |
| Other services                     | 0.88%   | 0.06%   | 0.88%   |
| Finance, banking and insurance     | 0.88%   | 1.26%   | 2.09%   |

## **7. Free Trade Area between Russia and the CIS countries**

Since the fall of the Soviet Union, different forces in the Russian political arena use theme of economic and particularly trade integration among the former Soviet republics as one of effective slogans. Several political initiatives were brought during these years. An account of trade policy activities on the CIS space is described in Freikman et al. [8]. First attempt to create an FTA on the CIS space was made in 1994, when all CIS countries except for Turkmenistan signed a plurilateral Agreement of the establishment of the Free Trade Area. This plan never realizes, since Russian Parliament did not ratify it.

Instead of one framework free trade agreement for all CIS countries a number of bilateral FTAs spring in this region. Russia has FTAs with all CIS countries, but these agreements permit unspecified potential exemptions and contingent protection. The most typical or core exemptions include sugar, tobacco, cigarettes, alcohol and some non-alcoholic beverages. There can be some non-core exemptions, for instance, Russia exempts Kazakh steel. Russia frequently uses contingent different measures of protection: temporary protection, anti-dumping measures, safeguard measures. Due to all the above, we find that on average imports of goods and services from CIS face the same high level of protection, as goods from the rest of the world.

There are no common tariffs in the CIS. Throughout the transition period multiple efforts were made to establish a Customs Union among all or some CIS members. The Customs Union incorporating Russia, Belarus, Kazakhstan, Kyrgyzstan and Tajikistan formally established in 1995. In 2000 it was transformed into the Eurasian Economic Community. However, the members fail to harmonize their tariffs and customs regimes and the Union exists only on paper. One of the members – Kyrgyzstan – joined the WTO in 1998 while others are still outside WTO. Hence, Kyrgyzstan cannot harmonize its tariffs due to its tariff commitments to the WTO. It is unlikely that a Customs Union incorporating above countries will function soon. A new effort to establish a Common Economic Space among the central CIS countries (Russia, Ukraine, Kazakhstan and Belarus) was introduced in the end of 2003. At present parliaments of Ukraine and Kazakhstan ratified this agreement. Russian parliament may ratify this agreement in the near future if the political will of the president Putin will force it. As for the Belarus it is difficult to forecast the timing of the ratification since it will hugely depend on the stage of relationships between Moscow and Minsk.

Since at this point formation of a custom union between CIS countries look politically unattainable, we limit our study by consideration of FTA scenarios. These scenarios are to reflect utilization of the existing bilateral agreements among Russia and CIS countries.

We proceed as in the previous sections: first discuss the scenario without NTMs, then gradually increase the level of trade integration.

### **The FTA-CIS-1 scenario: FTA between Russia and CIS (no NTMs.)**

In this scenario, welfare of Russia and CIS increase in expense of welfare decrease of AC and ROW. CIS countries experience largest welfare increase, while Russian welfare increase is much more modest. Table 1-1 explains why it happens. Trade between Russia and CIS increases in this case, while their trade with other countries decreases. Interestingly, this happens despite decrease of terms of trade of the CIS countries. Changes in the Russian production and trade industrial structure follow the pattern similar to the one observed in previous scenarios, where Russian welfare improved. Russian manufacturing production goes up, in export goes up, and its import of manufacturing goods goes up as well.

When NTM are taken into consideration, and formation of FTA does not involve changes in NTM, Russian welfare goes down, welfare of other countries goes down, and only CIS welfare increases, but only marginally. CIS countries experience the larges welfare increase in the third scenario, where NTM between Russia and CIS decrease by the factor of two. This happens in expense of welfare decline in other regions, which suffer from trade diversion. Russian production , export and import follows usual pattern in all scenarios, with minor changes.

***Table 7-1: Percentage change in total trade flows after FTA-EU-1***

| Source<br>Destination | RUS    | EU     | AC     | CIS    | ROW    |
|-----------------------|--------|--------|--------|--------|--------|
| RUS                   |        | -0.16% | -0.16% | 6.21%  | -0.16% |
| EU                    | 0.01%  |        | 0.02%  | -1.49% | 0.00%  |
| AC                    | -0.03% | -0.03% |        | -1.75% | -0.03% |
| CIS                   | 4.47%  | 1.18%  | 1.20%  |        | 1.19%  |
| ROW                   | -0.06% | 0.00%  | 0.02%  | -1.44% |        |

***Table 7-2: Terms of trade effect after FTA-CIS-1***

|     |                       | EU<br>Enlargement-<br>4 | FTA CIS1     | Percentage<br>Change |
|-----|-----------------------|-------------------------|--------------|----------------------|
| RUS | price of export       | 1.122                   | 1.118        | -0.29%               |
|     | price of import       | 1.153                   | 1.135        | -1.52%               |
|     | <b>Terms of Trade</b> | <b>0.973</b>            | <b>0.985</b> | <b>1.25%</b>         |

|     |                       |              |              |               |
|-----|-----------------------|--------------|--------------|---------------|
| EU  | price of export       | 1.129        | 1.129        | 0.00%         |
|     | price of import       | 1.123        | 1.123        | 0.00%         |
|     | <b>Terms of Trade</b> | <b>1.005</b> | <b>1.005</b> | <b>0.00%</b>  |
| AC  | price of export       | 1.071        | 1.070        | -0.02%        |
|     | price of import       | 1.129        | 1.129        | 0.01%         |
|     | <b>Terms of Trade</b> | <b>0.948</b> | <b>0.948</b> | <b>-0.03%</b> |
| CIS | price of export       | 1.140        | 1.126        | -1.21%        |
|     | price of import       | 1.172        | 1.162        | -0.89%        |
|     | <b>Terms of Trade</b> | <b>0.973</b> | <b>0.970</b> | <b>-0.32%</b> |
| ROW | price of export       | 1.128        | 1.127        | 0.00%         |
|     | price of import       | 1.127        | 1.127        | 0.01%         |
|     | <b>Terms of Trade</b> | <b>1.001</b> | <b>1.001</b> | <b>-0.01%</b> |

***Table 7-3: Changes in Russian production and trade after FTA-CIS-1.***

| FTA between Russia and CIS (EU-CIS-1) | Benchmark production, mln USD | Percentage change | Benchmark exports, mln USD | Percentage change | Benchmark imports, mln USD | Percentage change |
|---------------------------------------|-------------------------------|-------------------|----------------------------|-------------------|----------------------------|-------------------|
| Electricity and heat                  | 14,478                        | -0.09%            | 137.82                     | 0.45%             | 10.462                     | 0.77%             |
| Oil and gas                           | 91,188                        | 0.00%             | 44542.148                  | 0.17%             | 1031.281                   | 1.78%             |
| Other fuels                           | 4,340                         | 0.12%             | 2278.432                   | 0.49%             | 85.476                     | 1.91%             |
| Ferrous metallurgy                    | 17,354                        | 0.45%             | 14469.44                   | 0.61%             | 3620.213                   | 3.23%             |
| Nonferrous metallurgy                 | 24,018                        | 0.00%             | 16704.996                  | 0.07%             | 768.473                    | 1.06%             |
| Chemical industry and oil refinery    | 16,863                        | 0.14%             | 8889.991                   | 0.50%             | 4037.861                   | 1.31%             |
| Machinery and equipment               | 36,818                        | 0.11%             | 12642.158                  | 0.63%             | 15064.446                  | 0.41%             |
| Light industry                        | 4,931                         | -0.01%            | 779.05                     | 1.09%             | 1179.822                   | 4.09%             |
| Food-processing industry              | 45,249                        | -0.03%            | 2376.985                   | 1.23%             | 8305.435                   | 1.37%             |
| Other industries                      | 24,761                        | 0.02%             | 8562.702                   | 0.40%             | 5758.78                    | 0.32%             |
| Agriculture and forestry              | 30,853                        | -0.07%            | 518.348                    | 0.63%             | 2594.54                    | 0.56%             |
| Construction                          | 34,177                        | -0.09%            | 169.396                    | 0.19%             | 405.252                    | -0.24%            |
| Transport and communication           | 25,646                        | -0.05%            | 3911.181                   | 0.41%             | 1545.464                   | -0.31%            |
| Other services                        | 52,321                        | -0.06%            | 1895.313                   | 0.88%             | 1842.212                   | 1.10%             |
| Finance, banking and insurance        | 30,490                        | -0.08%            | 202.789                    | 1.44%             | 489.719                    | -0.37%            |

### Effects of the FTA between Russian and the CIS accounting for NTMs

***Table 7-4: Percentage change in total trade flows after FTA-CIS-2***

| Source<br>Destination | RUS    | EU     | AC    | CIS    | ROW    |
|-----------------------|--------|--------|-------|--------|--------|
| RUS                   |        | -0.04% | 0.05% | 0.16%  | -0.05% |
| EU                    | 0.03%  |        | 0.11% | -0.03% | -0.01% |
| AC                    | -0.13% | -0.16% |       | -0.20% | -0.18% |
| CIS                   | 0.15%  | 0.05%  | 0.16% |        | 0.03%  |
| ROW                   | 0.04%  | 0.01%  | 0.12% | -0.02% |        |

***Table 7-5: Percentage change in total trade flows after FTA-CIS--3***

| Source<br>Destination | RUS    | EU     | AC     | CIS    | ROW    |
|-----------------------|--------|--------|--------|--------|--------|
| RUS                   |        | -0.20% | -0.12% | 6.36%  | -0.21% |
| EU                    | 0.04%  |        | 0.10%  | -1.53% | -0.01% |
| AC                    | -0.12% | -0.16% |        | -1.92% | -0.17% |
| CIS                   | 4.65%  | 1.24%  | 1.34%  |        | 1.23%  |
| ROW                   | -0.02% | 0.01%  | 0.11%  | -1.47% |        |

***Table 7-6: Changes in Russian production and trade in scenarios FTA-CIS--2, FTA-CIS--3.***

| Russian exports                       | FTA-CIS-1<br>Percent<br>change in<br>exports | FTA-CIS-2<br>Percent<br>change in<br>exports | FTA-CIS-3<br>Percent<br>change in<br>exports |
|---------------------------------------|--|--|--|
| Electricity and heat                  | 0.45%  | 0.03%  | 0.48%  |
| Oil and gas                           | 0.17%  | 0.00%  | 0.17%  |
| Other fuels                           | 0.49%  | 0.03%  | 0.53%  |
| Ferrous metallurgy                    | 0.61%  | 0.02%  | 0.64%  |
| Nonferrous metallurgy                 | 0.07%  | 0.02%  | 0.10%  |
| Chemical industry and oil<br>refinery | 0.50%  | 0.02%  | 0.52%  |
| Machinery and equipment               | 0.63%  | 0.01%  | 0.64%  |
| Light industry                        | 1.09%  | 0.03%  | 1.13%  |
| Food-processing industry              | 1.23%  | 0.04%  | 1.27%  |
| Other industries                      | 0.40%  | 0.03%  | 0.43%  |
| Agriculture and forestry              | 0.63%  | 0.03%  | 0.66%  |
| Construction                          | 0.19%  | 2.15%  | 2.37%  |
| Transport and communication           | 0.41%  | 0.04%  | 0.45%  |
| Other services                        | 0.88%  | 0.04%  | 0.93%  |
| Finance, banking and<br>insurance     | 1.44%  | 1.92%  | 3.57%  |

| Russian production                    | FTA-CIS-1<br>Percent<br>change in<br>production | FTA-CIS-2<br>Percent<br>change in<br>production | FTA-CIS-3<br>Percent<br>change in<br>production |
|---------------------------------------|---|---|---|
| Electricity and heat                  | -0.09%  | -0.01%  | -0.09%  |
| Oil and gas                           | 0.00%   | 0.00%   | 0.00%   |
| Other fuels                           | 0.12%   | 0.01%   | 0.13%   |
| Ferrous metallurgy                    | 0.45%   | 0.01%   | 0.46%   |
| Nonferrous metallurgy                 | 0.00%   | 0.01%   | 0.01%   |
| Chemical industry and oil<br>refinery | 0.14%   | 0.00%   | 0.14%   |
| Machinery and equipment               | 0.11%   | -0.01%  | 0.10%   |
| Light industry                        | -0.01%  | 0.00%   | -0.01%  |
| Food-processing industry              | -0.03%  | 0.00%   | -0.04%  |

|                                |        |        |        |
|--------------------------------|--------|--------|--------|
| Other industries               | 0.02%  | 0.00%  | 0.02%  |
| Agriculture and forestry       | -0.07% | -0.01% | -0.08% |
| Construction                   | -0.09% | 0.01%  | -0.08% |
| Transport and communication    | -0.05% | 0.00%  | -0.05% |
| Other services                 | -0.06% | 0.00%  | -0.06% |
| Finance, banking and insurance | -0.08% | 0.01%  | -0.07% |

| <b>Russian imports</b>             | FTA-CIS-1<br>Percent<br>change in<br>imports | FTA-CIS-2<br>Percent<br>change in<br>imports | FTA-CIS-3<br>Percent<br>change in<br>imports |
|------------------------------------|--|--|--|
| Electricity and heat               | 0.77%  | 0.02%  | 0.82%  |
| Oil and gas                        | 1.78%  | -0.06%                                       | 1.71%  |
| Other fuels                        | 1.91%  | -0.06%                                       | 1.84%  |
| Ferrous metallurgy                 | 3.23%  | -0.05%                                       | 3.16%  |
| Nonferrous metallurgy              | 1.06%  | -0.05%                                       | 1.00%  |
| Chemical industry and oil refinery | 1.31%  | -0.05%                                       | 1.24%  |
| Machinery and equipment            | 0.41%  | -0.04%                                       | 0.36%  |
| Light industry                     | 4.09%  | -0.05%                                       | 3.99%  |
| Food-processing industry           | 1.37%  | -0.05%                                       | 1.31%  |
| Other industries                   | 0.32%  | -0.04%                                       | 0.28%  |
| Agriculture and forestry           | 0.56%  | -0.05%                                       | 0.51%  |
| Construction                       | -0.24%                                       | 1.91%  | 1.65%  |
| Transport and communication        | -0.31%                                       | -0.04%                                       | -0.35%                                       |
| Other services                     | 1.10%  | -0.04%                                       | 1.05%  |
| Finance, banking and insurance     | -0.37%                                       | 2.16%  | 1.78%  |



## 8. Conclusions

This paper studies the effect of different trade liberalization arrangements on Russian economy. It is shown that Russian welfare improves in almost all cases. Creation of FTA between Russia and enlarged EU brings the highest welfare gains for Russia. The novelty of this paper is that it includes CIS countries in consideration. CIS welfare increases in all scenarios, where its trade barriers with Russia go down, confirming the importance of Russia as a trade partners of these countries. This paper does not include scenarios where EU liberalizes its trade with the CIS. It is conceivable that in this case CIS welfare would have increase even further.

This paper also makes an attempt to estimate non trade barriers, and simulate the effect of decrease of such barriers in various trade liberalization arrangements. Inclusion of trade barriers into consideration changes results dramatically. For example, simple tariff barriers decrease in the presence of NTM brings almost no welfare effects. Hence, decrease of non-tariff barriers is no less important nowadays, than decrease in tariff barriers.

There are some problems with the modeling strategy, which we uses regarding NTM. We model them as usual tariffs, which bring tariff revenues to the countries, which impose them. To the extend that our NTM measure reflects MFN exceptions, this is a correct procedure. However, a more careful modeling strategy should allow for the fact that profits from price increase in the case of non-tariff barriers can accrue to importing countries, as it happens in the case of quotas.

## 9. Bibliography.

1. Annual report of director-general of the WTO “*Overview of developments in the international trading environment*”, WT/TPR/OV/8, November 2002
2. Aussilloux Vincent and Pajot Michael. “*Trade Issues in European Union Enlargement.*”. University of Paris, 2001
3. Brenton P., Tourdyeva N. and J. Whalley, “*The economic impact of a free trade agreement between Russia and the EU: Numerical simulations using a general equilibrium trade model*”, report prepared for TACIS project ‘Policy Advice on GATT/WTO to Russia’, mimeo, CEPS, Brussels, July 2002.
4. Chatti Rim “*An AGE assessment of FTA between Tunisia and the EU under Oligopolistic market structures*”, draft version.
5. Hamillton C.B. “*Russia’s European integration: Escapism and current realities*”, CERP WP, 2003.
6. Harrison Glenn W., Rutherford Thomas F., Tarr Thomas F. and Gurgel Thomas F. “*Regional, Multilateral and Unilateral Trade Policies of MERCOSUR for Growth and Poverty Reduction in Brazil*”, February 2002.
7. Francois J.F and Roumbout, M. “*Trade effects from the integration of the Central and East European Countries into the European Union*”, SEI WP # 41, 2001.
8. Francois J., van Meijl, H. and F. van Tongeren, 2002, “*Trade Liberalization and Developing Countries under the Doha Round*”, CERP Discussion Papers, No. 4032
9. Freikman, L. et al. “*Trade performance and regional integration of the CIS countries*”, Poverty Reduction and Economic Management Sector Unit Europe and Central Asia Region, April 2004.
10. Jensen Jesper, Rutherford Thomas, Tarr David “*Economy-Wide Effects of Russia’s Accession to the WTO*”, SIDA-CEFIR conference, June 24-25, 2002
11. Lejour A.M., Mooij R.A., Nahuis R. “*EU enlargement: Economic implications for countries and industries*” CPB Document, September 2001.
12. Messerlin, P. A., 2001, “*Measuring the Costs of Protection Europe. European Commercial Policy in the 2000s*”, Institute for International Economics, Washington, DC
13. Robinson Sherman “*Trade Liberalization and Regional Integration: The search for large numbers*”, TMD discussion paper #34, January 1999

14. Samson I. and X. Greffe, *“Common Economic space: prospects of Russia-EU relations”* White book, RECEP for TACIS Europe Aid European Commission, October 2002.
15. Shestalova M. *“Elasticities of Substitution Between Imported and Domestically Produced Goods for Russian Economy”*, MIMEO, NES, 2004
16. de Souza L.V. *“A wider Europe: The effects of the Russian WTO Accession and the EU enlargement.”* Paper for ABCDE-Europe Conference, May 10-11, 2004
17. Sulamaa P. and Widgren M. *“EU-enlargement and the opening of Russia: lessons from the GTAP reference model”*. The research Institute of the Finnish economy. DP No.825, October 2002.
18. Госкомстат России, Центр по экономическим классификациям *“Переходной ключ между ОКДП и ОКОНХ”*, Москва, 1994
19. Госкомстат России, *“Российский статистический ежегодник 2001”*, 2002, Москва.
20. Земницкий А. *“Оценка последствий устранения нетарифных барьеров для иностранных компаний в секторе услуг российской экономики: структурный подход.”*, HSE Working Paper, 2002.
21. Российская Академия Наук, национальный совет *“Народнохозяйственный последствия присоединения России к ВТО”*, Москва, 2002.
22. *“Внешняя торговля услугами Российской Федерации”*. 2002. Центральный банк Российской Федерации.
23. *“Переходной ключ между ОКДП и ОКОНХ”*. 1994. Госкомстат России, Центр по экономическим классификациям
24. *“Таможенная статистика внешней торговли Российской Федерации.”* 2000. Государственный таможенный комитет Российской Федерации.

## Appendix: data

### Box 1

Log of import of specific commodity from one country to another is used as a dependent variable. The list of explanatory variables includes:

- 1) GDP – log of products of countries' GDPs
- 2) GDP\_pc – log of products of countries' GDPs per capita
- 3) distance – log of distance between countries' capitals
- 4) area – log of products of countries' areas
- 5) landlocked – number of landlocked countries in the pair
- 6) island – number of island nations in the pair
- 7) border – binary variable which is unity if countries in the pair have the common border
- 8) geographical dummy variables for each country in the pair (South Asia, Sub-Saharan Africa, East Asia, Latin-Caribbean countries, Middle East and North Africa, Caribbean countries)
- 9) economic dummy variables for each country in the pair (High Income countries, Middle Income Countries, Low Income Countries, Least Developed Countries)
- 10) tariffs – log of sum of unity and import tariff of importing country (for corresponding sector)
- 11) production – share of corresponding sector in total GDP for each country in the pair
- 12) sector specific variables for each country in the pair

Note: for (11) and (12) average values for corresponding macro-regions are used instead of country's values.

**Table 1.1 Sector-specific variables (from World Development Indicators):**

|    | <b>sector</b>                         | <b>Sector-specific variable</b>                                       |
|----|---------------------------------------|---|
| 1  | Electricity and heat                  | Log of electricity production per capita                              |
| 2  | Oil and Gas                           | Fuel exports (% of merchandise exports)                               |
| 3  | Other Fuels                           | Fuel exports (% of merchandise exports)                               |
| 4  | Ferrous metallurgy                    | Ores and metals exports (% of merchandise exports)                    |
| 5  | Nonferrous metallurgy                 | Ores and metals exports (% of merchandise exports)                    |
| 6  | Chemical industry and oil refinery    | Chemicals (% of value added in manufacturing)                         |
| 7  | Machinery and equipment               | Machinery and transport equipment (% of value added in manufacturing) |
| 8  | Light industry                        | Textiles and clothing (% of value added in manufacturing)             |
| 9  | Food-processing industry              | Agriculture, value added (% of GDP)                                   |
| 10 | Other industries                      | Other manufacturing (% of value added in manufacturing)               |
| 11 | Agriculture and services and forestry | Agriculture, value added (% of GDP)                                   |
| 14 | Other services                        | Other commercial services (% of commercial service exports)           |

**Table 1.2. Elasticities from Francois et al, 2003**

|    | <b>sector</b>                         | <b>elasticity</b> | <b>corresponding sector from Francois</b>                              |
|----|---------------------------------------|-------------------|--|
| 1  | Electricity and heat                  | 6.638             | Extraction industries  |
| 2  | Oil and Gas                           | 6.638             | Extraction industries  |
| 3  | Other Fuels                           | 6.638             | Extraction industries  |
| 4  | Ferrous metallurgy                    | 6.638             | Extraction industries  |
| 5  | Nonferrous metallurgy                 | 6.638             | Extraction industries  |
| 6  | Chemical industry and oil refinery    | 6.005             | Petrochemicals   |
| 7  | Machinery and equipment               | 5.720             | Metal and electro technical industries                                 |
| 8  | Light industry                        | 8.909             | Textiles, leather & clothing   |
| 9  | Food-processing industry              | 8.983             | Processed food products  |
| 10 | Other industries                      | 5.946             | Other industries   |
| 11 | Agriculture and services and forestry | 2.200             | Cereals, Horticulture & other crops, Sugar, plants and processed, etc. |
| 14 | Other services                        | 4.670             | Other private and public services                                      |

**Table 1.3. Estimated tariff equivalents of NTM**

|      |      | Electricity and heat | Oil and gas | Other fuels | Ferrous metallurgy | Non-ferrous metallurgy | Chemicals and oil refinery | Machinery and equipment | Light industry | Food-processing industry | Other industries | Agriculture and forestry and services | Other services |
|------|------|----------------------|-------------|-------------|--------------------|------------------------|----------------------------|-------------------------|----------------|--------------------------|------------------|---------------------------------------|----------------|
| to   | from | 1                    | 2           | 3           | 4                  | 5                      | 6                          | 7                       | 8              | 9                        | 10               | 11                                    | 14             |
| CEEC | CEEC | 0.0                  | 0.0         | 0.0         | 0.0                | 0.0                    | 2.9                        | 5.6                     | 0.0            | 0.0                      | 4.4              | 0.0                                   | 0.0            |
| CEEC | CIS  | 0.0                  | 0.0         | 0.0         | 0.0                | 0.0                    | 0.0                        | 0.0                     | 0.0            | 3.5                      | 0.0              | 0.0                                   | 52.8           |
| CEEC | EU   | 0.0                  | 0.0         | 0.0         | 0.0                | 0.0                    | 0.0                        | 0.0                     | 0.0            | 6.4                      | 0.9              | 0.0                                   | 0.0            |
| CEEC | ROW  | 0.0                  | 41.8        | 12.2        | 66.7               | 48.5                   | 107.6                      | 124.0                   | 51.7           | 45.8                     | 85.4             | 301.0                                 | 65.6           |
| CEEC | RUS  | 0.0                  | 0.0         | 0.0         | 0.0                | 0.0                    | 0.0                        | 0.0                     | 0.0            | 0.0                      | 0.0              | 31.7                                  | 0.0            |
| CIS  | CEEC | 0.0                  | 6.6         | .           | 5.2                | 0.0                    | 12.7                       | 19.2                    | 0.0            | 0.0                      | 16.9             | 0.0                                   | 3.5            |
| CIS  | CIS  | 0.0                  | 0.0         | 0.0         | 0.0                | 0.0                    | 5.2                        | 0.0                     | 0.5            | 0.0                      | 0.0              | 0.0                                   | 4.2            |
| CIS  | EU   | .                    | 0.0         | 0.0         | 0.0                | 0.0                    | 6.4                        | 11.0                    | 0.0            | 4.8                      | 11.6             | 0.0                                   | 0.0            |
| CIS  | ROW  | 25.7                 | 13.0        | 0.0         | 15.3               | 25.9                   | 49.4                       | 59.5                    | 23.0           | 16.2                     | 35.4             | 63.8                                  | 9.9            |
| CIS  | RUS  | 0.0                  | 0.0         | 0.0         | 0.0                | 0.0                    | 0.0                        | 0.0                     | 0.0            | 0.0                      | 0.0              | 0.0                                   | 0.0            |
| EU   | CEEC | 0.0                  | 0.0         | 0.0         | 0.0                | 0.0                    | 0.9                        | 0.0                     | 0.0            | 0.0                      | 3.4              | 0.0                                   | 0.0            |
| EU   | CIS  | .                    | 0.0         | 0.0         | 0.0                | 0.0                    | 0.0                        | 0.0                     | 0.0            | 0.0                      | 0.0              | 0.0                                   | 46.9           |
| EU   | EU   | 0.0                  | 0.0         | 0.0         | 2.8                | 0.0                    | 3.7                        | 4.9                     | 2.9            | 0.0                      | 3.8              | 0.0                                   | 0.0            |
| EU   | ROW  | 0.0                  | 127.1       | 16.5        | 48.6               | 53.0                   | 103.7                      | 156.1                   | 62.9           | 56.0                     | 112.8            | 375.3                                 | 71.3           |
| EU   | RUS  | 0.0                  | 0.0         | 0.0         | 0.0                | 0.0                    | 0.0                        | 0.0                     | 0.0            | 0.0                      | 0.0              | 0.0                                   | 0.0            |
| ROW  | CEEC | 0.0                  | 0.0         | 0.0         | 9.5                | 0.0                    | 34.8                       | 27.7                    | 9.3            | 1.2                      | 25.1             | 0.0                                   | 0.0            |
| ROW  | CIS  | 0.0                  | 21.0        | 0.0         | 28.7               | 50.5                   | 61.9                       | 84.9                    | 51.9           | 51.2                     | 76.5             | 206.0                                 | 69.1           |
| ROW  | EU   | 5.0                  | 57.1        | 0.0         | 63.0               | 31.3                   | 81.5                       | 81.9                    | 35.7           | 22.1                     | 79.4             | 13.8                                  | 69.2           |
| ROW  | RUS  | 0.0                  | 23.2        | 0.0         | 0.0                | 4.1                    | 0.0                        | 0.0                     | 6.9            | 0.0                      | 0.0              | 5.2                                   | 0.0            |
| RUS  | CEEC | .                    | 0.0         | 1.6         | 11.1               | 0.3                    | 0.0                        | 0.0                     | 8.8            | 0.0                      | 0.0              | 0.0                                   | 0.0            |
| RUS  | CIS  | 0.0                  | 0.0         | 0.0         | 0.0                | 0.0                    | 0.0                        | 0.0                     | 0.0            | 0.0                      | 0.0              | 0.0                                   | 0.0            |
| RUS  | EU   | 66.3                 | 0.0         | 0.0         | 0.0                | 0.3                    | 0.0                        | 0.0                     | 10.5           | 0.0                      | 0.0              | 0.0                                   | 0.0            |
| RUS  | ROW  | .                    | 10.5        | 0.0         | 0.0                | 5.9                    | 6.0                        | 15.5                    | 15.5           | 1.5                      | 11.7             | 0.0                                   | 0.0            |