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Economic effects of free trade between the EU and Russia

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Keskusteluaiheita – Discussion papers

No. 969

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ECONOMIC EFFECTS OF FREE TRADE BETWEEN THE EU AND RUSSIA***

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ABSTRACT: This study simulates the economic effects of Eastern Enlargement of the EU and the EU-Russia free trade area. The main emphasis of the paper is in effects to Russian economy. The simulations were carried out with GTAP computable general equilibrium model using the most recent GTAP database 6.0beta, which takes the former Europe agreements between the EU15 and eight new CEE-members into account. The results confirm the earlier findings that free trade agreement with the EU is beneficial for Russia in terms of total output but not necessarily in terms of economic welfare when measured by equivalent variation. The main reason behind this is deterioration in Russia's terms-of-trade. Improved productivity in Russia would make the free trade agreement with the EU beneficial.

JEL codes: F15, F17

KEY WORDS: EU, Russia, free trade, integration

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TIIVISTELMÄ: Tässä tutkimuksessa simuloidaan EU:n itälaajenemisen sekä EU:n ja Venäjän välisen vapaakauppasopimuksen taloudellisia vaikutuksia. Tutkimuksen pääpaino on vaikutuksissa Venäjän kannalta. Simuloinnit on tehty laskettavalla yleisellä tasapainomallilla GTAP käyttäen tuoreinta 6.0beta tietokantaa kauppavirroista ja kaupan esteistä. Tulokset vahvistavat jo aiemmissä tutkimuksissa saatuja tuloksia, joiden mukaan vapaakauppasopimus EU:n kanssa lisää Venäjän kokonaistuotantoa hieman, mutta ei välttämättä lisää sen taloudellista hyvinvointia ellei sopimus saa aikaan merkittävää tuottavuuden paranemista Venäjällä. Merkittävin tekijä vaikutusten taustalla on Venäjän heikkenevä vaihtosuhte.

JEL: F15, F17

ASIASANAT: EU, Venäjä, vapaakauppa, integraatio

1 Introduction

EU enlargement process has changed European trade relations. A common fear related to wider EU is that it potentially marginalizes European economies that are or are left outside deeper and wider integration. As the major part of the continent belongs to the EU's trade policy regime the question how enlarged EU organizes its trade relations with the rest of the continent becomes more important. One of the key issues with this respect is the relationship between the EU and Russian Federation (RF). The legal basis for EU relations with Russia is based on the Partnership and Cooperation Agreement of 1997.

A natural starting point in considering the possible deepening of the EU-RF economic relationship would be a free trade agreement (FTA). In this paper, we examine economic effects of widening and deepening of EU-RF integration. The eastern enlargement, which widened the Internal Market (IM) to an area having a number of consumers almost twice as much as in the United States has an important impact on Russia. The enlarged Europe accounts over 50 percent of RF exports and imports. Economic development in the European markets can therefore have major effects on the Russian economy via the trade linkages.

Eastern enlargement is likely to affect Russian trade at least in three ways. First, lower trade barriers within the IM divert imports from Russia to intra-IM trade. This is because lower trade barriers within the IM favour IM-based exporters in terms of relative prices. This has a negative impact on Russian exporters but also from the viewpoint of the EU member states it creates welfare loss. The effect is likely to be rather small, though, since trade between the current incumbent member states and candidate countries is relatively free due to Europe Agreements. Therefore, the impact of expanding EU membership should not contribute significantly to trade diversion.

Second, as Russian exporters are hit by the relative price changes and as the EU is an important market area for them, it is likely that Russian exporters face a negative terms-of-trade effect. This yields a welfare gain for the EU and a loss for the Russian economy.

Third, within the EU, lower trade barriers create trade. This gives an additional welfare gain for the EU countries but might also contribute positively to Russian domestic economy. In fact, there is some evidence that EU-integration has created trade also externally through increased demand. In the case of eastern enlargement this effect is likely to be boosted by the fact that the current EU member states pursue a more liberal trade policy towards Russia than the candidate countries that will adopt the EU norm after the enlargement. The direct total effect on Russian economy is the sum of these three effects.

Lower trade barriers within the EU intensify intra-Internal Market substitution and improve EU-based firms' efficiency. As trade barriers between candidate countries and the EU are already quite low improved substitution is likely have much more substantial role in shaping events than the direct effects that are due to removal of visible trade barriers.

Eastern enlargement may marginalize Russian economy also via foreign direct investments. Full membership gives the CEECs a more favourable position as host countries for FDIs relative to Russia than today. This may, in turn, divert integration and productivity gains.

In this paper, we investigate the above-described effects quantitatively using a computable general equilibrium model. We analyse two different regime changes, first EU eastern enlargement and, second, a free trade area (FTA) between the enlarged EU and RF.

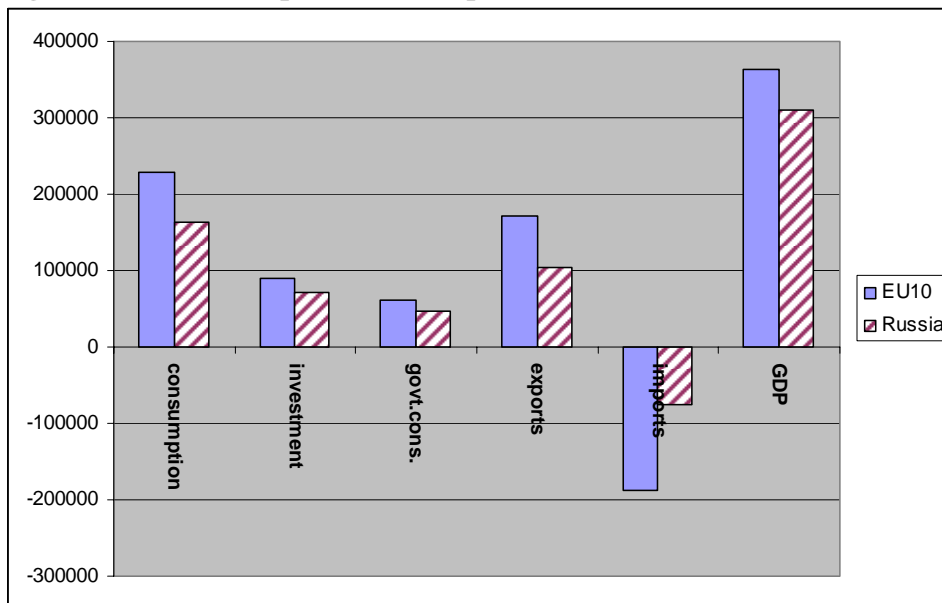
In each scenario, we have three sub scenarios. First, the one where trade is liberalized, i.e. the base enlargement or EU-RF free trade area. Second, we assume that in addition to the base impact the substitution between foreign and domestic goods becomes more elastic. This can be interpreted arguing that deeper integration decreases market segmentation. Our third scenario adds a productivity growth to this, which may be due to more intensified competition or increased FDI.

The rest of the paper is organized as follows. The next section describes the current state of affairs in trade relations between the EU and Russia. Section 3 gives the model and describes the level of aggregation and other assumption we have made. Section 4 describes the simulations more carefully. Section 5 gives the results and, finally, section 6 concludes.

2 Asymmetric partners

Both the EU Eastern enlargement (EU15 vs. new members) and the EU-Russian cooperation involve interaction of two fairly asymmetric trading blocks, both in size and structure of their economies. Taken together the total output of the new EU member states is roughly 4 % of that of the EU15¹. Russia's position vis-à-vis the enlarged EU (EU25) is similar. Picture 1 below shows the GDP expenditure components of the EU10 and Russia. Russia's economic size is roughly the size of the combined GDP of the new EU10 economies.

Figure 1 GDP expenditure components in Russia and EU10

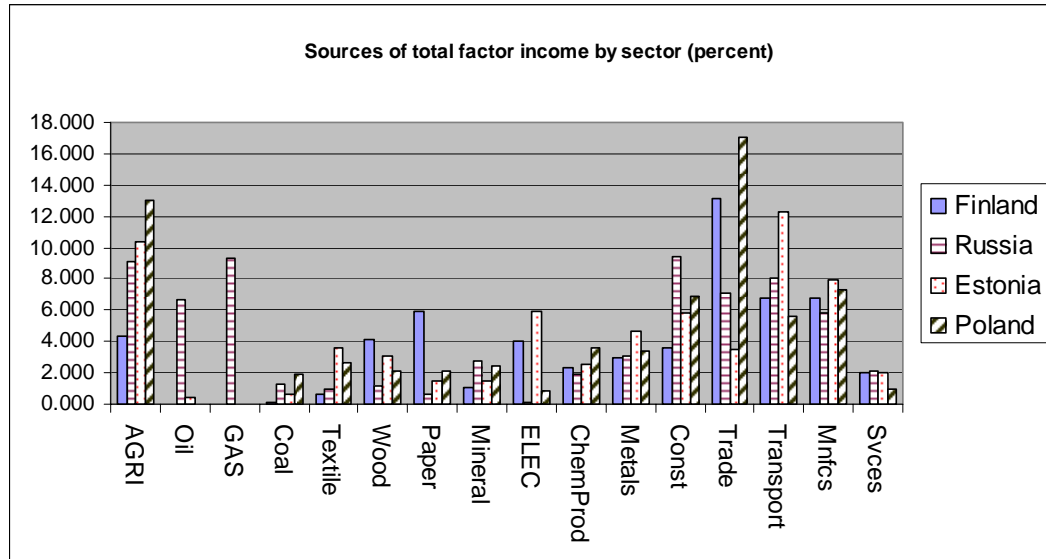


Source: GTAP database 6.0, Unit in millions of 2001 U.S. dollars

¹ Using the GTAP database version 6.0 which is based on 2001 data.

The new members have nearly two times higher GDP share of agricultural production than the EU15 average and nearly three times lower per capita GDP than the EU15. Below figure illustrates the sources of total factor income (sum of land, labour, capital and natural resources) by sector in Finland, Russia, Estonia and Poland. The distribution of the factor income shows the relative importance of the energy sectors (oil, gas and coal) as well as agricultural and construction sectors in Russia. In Poland, the agriculture, trade and manufactures are notably relatively more important income sources.

Figure 2 Sources of total factor income by sector in selected countries



Also, the level of trade protection varies between the new EU-countries, the EU15 and Russia. The new GTAP 6.0 beta database takes into account the Europe Agreements which were bilateral trade agreements between the new EU members and the EU15 countries. This means that the EU-enlargement scenario effects come mainly from the CET tariff change and changes in import tariffs of agricultural products. Table 1 below² reports the import tariff changes for agricultural products in the EU-enlargement scenario.

² The tables 1, 2 and 3 show what percent changes in powers are needed to move the tariff rates to zero within union. For example to eliminate rate of 20% (rate%=-100), the power of the tax must change from 1.2 to 1.0: a change of -16.67%. The table reports the changes on power of tariffs needed to abolish within TU tariffs or to conform to the EU external tariffs.

3 The GTAP model and database

The Global Trade Analysis Project (GTAP) (<http://www.gtap.agecon.purdue.edu>). model is a multi-region, computable general equilibrium (CGE) model. The inter-regional linkages originate from bilateral trade flows, while intra-industry linkages are captured by the regional input-output structure. The GTAP database covers bilateral trade data, structure of production, consumption and intermediate use of commodities and services. The latest version of the database, GTAP 6 Beta³, includes 87 different regions and 57 different sectors of production.

The standard GTAP-model is a multi-region, applied general equilibrium model, with perfect competition and constant returns to scale. Imports are differentiated by their source from domestic goods, that is, the Armington assumption is made on bilateral trade.

GTAP model computes money metric equivalent of aggregate per capita utility for each region (using the regional household's utility function). The regional household's Equivalent Variation (EV) which is the difference between the expenditure required to obtain the new, post-simulation level of utility at initial prices.

Each industry is represented by a single homogeneous commodity. The basic model includes three to five factors of production: labour (possible to disaggregate into skilled and non-skilled), capital, land and natural resources. Labour and capital are mobile across domestic sectors, while land is assumed to be used only in agricultural sectors. Capital is traded internationally like intermediate inputs, while labour and land are not mobile across borders. Next we present shortly the main block of the model.

Regional Household

In each region, there is a regional household whose Cobb-Douglas preferences are defined over composite private expenditures, composite public sector expenditures and savings. The regional household derives income from ownership and sales of primary factors of production - capital, skilled and unskilled labour, land and natural resources. It turns out that the inter-temporal, extended linear expenditure system could be derived from an equivalent, static maximisation problem, in which savings enters the utility function (Howe, 1975). This result provides a justification for the inclusion of savings in the regional utility function.

Private expenditures are governed by a Constant Difference of Elasticity (CDE) function which was first proposed by Hanoch (1975). The CDE function has the desirable property that the resulting preferences are non-homothetic and is more parsimonious in its parameter requirements than functional flexible forms. It can also be shown that the CES and the Cobb-Douglas are special cases of the CDE function. Government expenditures are governed by a Cobb-Douglas preference function. Finally, there is inter-industry demand whose technical specifications are described by the usual input-output matrix.

³ Compared to the previous release (version 5.4), the new database has 13 new primary regions. Primary regions are the countries for which we have contributed input-output tables. The 13 new regions introduced are: Albania, Bulgaria, Croatia, Cyprus, Czech Republic, Malta, Romania, Slovakia, Slovenia, Estonia, Latvia, and Lithuania and the Russian Federation.

Production

Production is presented by a multi-level production function. The upper nest is a Leontief production function involving value added and intermediate inputs. Value added is produced through a Constant Elasticity of Substitution (CES) function of the three primary factors of production. Each intermediate input is in turn produced using domestic and imported components (the Armington assumption) with the technical process described by a CES function. Finally, imported components are a mix of imports from the other regions in the global model with the technical process again described by a CES function.

Households own all factor supplies - land, natural resources, capital, skilled and unskilled labour and sell their services to firms. In the GTAP model, sluggishness of some factors is allowed so that it is possible for factor prices not to be equalised within a region. Firms are supposed to sell output and purchase inputs (whether primary factors or intermediates) in competitive markets. Hence, firms make no economic profits.

Labour and capital are mobile across domestic sectors, while land is assumed to be used only in agricultural sectors. Capital is traded internationally like intermediate inputs, while labour and land are not mobile across borders.

Savings and Investment

Given the Cobb-Douglas assumption about preferences of the regional household, savings are a constant proportion of regional household income. The pool of savings is what becomes available for investments. There is a capital goods sector in each region, which produces the investment goods. The rate of return on capital goods is assumed to be inversely related to the stock of capital. The allocation of investment across regions and sectors is done in such a way that expected regional rates of return change by the same percentage. In the model, the pooling of savings and the global allocation of investment is done costlessly.

The GTAP model does not contain a financial sector. An investment is therefore represented by a unique investment good that is not form-specific, sector-specific, or region-specific. As such, the model framework has a limitation in the flow analysis of FDI. The model is strongly relevant, though, to general equilibrium analyses of an FDI-related increase in a region's capital stock, and of a technology spill-over.

Macro Framework

In the GTAP model, private households and government are treated as a single decision-making economic agent called the regional household. Private households supply productive factors (land, labour, and capital) to producers, and obtain factor income in return. Government revenues come from household income taxes, producers' taxes, and taxes on international transactions (minus subsidies if they exist). Regional income is defined as the sum of private households' factor income and government revenues minus capital stock depreciation. Regional income in excess of regional expenditures is saved and used as investments by producers. Two global sectors complete the system. The global transportation sector provides services that account for the difference between FOB and CIF values for a particular commodity shipped along a specific route. The global banking sector is designed in such a way as to secure the global savings-investment consistency.

Data

This study utilises the latest GTAP database version 6.0 beta. The original data consists of 87 separate regions with each region including 57 different sectors of production. The base year for the data is 2001.

The original GTAP data was aggregated into 17 sectors of production and 9 regions. The complete sectoral and regional aggregations are illustrated in the appendix. Since the emphasis of this analysis is in the EU-Russia relationship eight out of nine regions stem from this. Estonia, Finland, Germany, Poland and Russian Federation are included as own regions and the rest of the EU10 and EU15 are grouped in two separate groups (see appendix).

The 57 sectors of production were aggregated into 17. To some extent the aggregation reflects the importance of different sectors for the Russian economy. The main focus of this paper is however in aggregate effects and a detailed analysis of the effects on production sectors is left for future research.

4 Policy scenarios

The impact of Eastern Enlargement

EU1: EU-enlargement

Three different EU-enlargement simulations were implemented. The first is a scenario where all bilateral tariffs and export subsidies between the EU and the new member states (Poland, Estonia and rest of the new members, henceforth this whole group is referred in the text as CEEC group) are abolished, and the EU average common external tariff (CET) is applied to the CEEC group. This scenario is labelled as EU1 in the tables reporting the simulation results.

Changes in tariff rates are higher for the CEEC group than for EU, which reflects higher degree of protection in the new member states.

EU2: EU-enlargement and internal market

The above EU-enlargement simulation did not take into account the fact that the enlargement involves the accession of the new members to the internal market. This will have further effect to these economies via trade, FDI, domestic investment etc. Thus, it is fair to say that the above simulation to some extent underestimates the long run impacts of the enlargement. Accession to the internal market means that number of administrative barriers to trade, as well as number of technical barriers of trade, i.e. minimum requirements, harmonisation of rules and regulations etc., are abolished. Furthermore, it may be argued that risk and uncertainty will be mitigated by the CEEC group accession to the EU.

In order to take into account some of these integration effects we did a second EU-enlargement simulation with higher degree of import demand elasticity within the customs union. This meant increasing the Armington elasticities for a number of key sectors. In the GTAP model, the Armington is applied in international trade. The assumption means that commodities with the same name, produced by different countries, are

imperfect substitutes. The Armington assumption implies that imperfect substitutes can have different prices in different countries and explains two-way trade between regions. By increasing substitutability between domestically produced and imported good within customs union, we hope to capture some of the internal market effects that further encourage trade within the area. In fact, this scenario attempts to capture reduced market segmentation, which is a likely as the IM removes non-visible trade barriers.

The simulation with increased Armington elasticity values involved re-specifying the old commodity specific elasticity value vector into region-commodity matrix of values. It was assumed that the existing estimates for the elasticity values (ranging from 1.8 to 4.4) were doubled within the CU. The model stability with respect to the elasticity values was checked by doing series of simulations with less dramatic increases in the elasticity values. Results showed that qualitatively the smaller increases were consistent with the reported case.

EU3: EU-enlargement and factor productivity increase within CEEC7

The third EU-enlargement scenario involved implementing the EU2 scenario with additional increase in total factor productivity in the new EU member regions. Labour as well as capital productivity is bound to rise in CEEC group due to increased foreign investment, labour migration, increased competition etc. This simulation involved imposing a 6 % increase in CEEC7 factor productivity parameter. It must be emphasised that the 6 % does not correspond to yearly change – rather it is some kind of approximation for a one-shot increased productivity change in the new, post accession, equilibrium.

Jensen, Rutherford and Tarr (2004) analyse the medium run effects of Russia joining the WTO and found that the gains originate mainly from a FDI liberalization in services (70% of the gains).

RU1: free trade area between enlarged EU and Russia Federation

The free trade area (FTA) scenario between the Russian Federation and the enlarged EU involved basically the same policy shock simulations as in the above EU enlargement case (removal of bilateral tariffs, Armington elasticity value and factor productivity increase in the FSU). The main difference here is of course that there is no CET constraint on the FSU. These simulations are labelled as RU1, RU2 (Armington) and RU3 (RU2 + factor productivity increase in Russia). In RU2 scenario we doubled Armington elasticities within EU25 + Russia regions.

When interpreting the results in the FTA scenarios one should bear in mind that now the point of reference is the equilibrium database that corresponds to the post EU-enlargement simulation. In the EU enlargement case the point of reference was the base year equilibrium of the GTAP database 6.0, that is year 2001.

5 Simulation results of the EU-enlargement and Russian-EU25 FTA scenarios

Abolishing trade barriers affects directly to the relative prices of intermediate inputs and final goods. Changes in demand for goods from different regions lead to trade creation and trade diversion. Free trade means that prices reflect relative scarcities so that coun-

tries can better exploit the gains from trade. Trade creation involves reallocation of production between different regions creating efficiency improvement in overall production. Furthermore, elimination of trade barriers affects terms of trade, that is, the price of exports relative to imports. Abolishing import tariffs will improve terms of trade for countries that export their goods to that market. While such trade of terms improvement may harm domestic production it can welfare improve welfare due to rise of value of its produced goods relative to imported goods.

All results are reported in terms of percentage changes compared to the relevant reference. In case on EU-enlargement this reference is the GTAP base year (2001) equilibrium. In case of the FTA simulation the point of comparison is the post EU-CEEC enlargement equilibrium data. It is also worth mentioning that one should read the results more in qualitative terms than attach weight on specific numerical values, which in any case depend on the model's parameter values and the chosen 'business as usual' reference scenario.

Real GDP

Table 1 gives the simulation results on total output (real gdp percentage changes). In the following tables the EU1-EU3 figures are percentage changes from the GTAP base year 2001 data values, while RU1-RU3 are changes with respect to database that corresponds to the EU1 scenario (EU enlargement has taken place).

In the EU-enlargement scenarios (EU1-EU3) we find that the most significant effects are, as expected, on the new members Poland (0.3 – 1.6 %), Estonia (0.06 -1.2 %) and the rest of the joining members (0.09 -1.2 %). The impact for the incumbent EU countries on the other hand is very small. The small (close to zero) negative effect on Finnish real GDP comes from a negative terms of trade effect. Overall the results confirm the standard outcome that the new entrants are likely gain from eastern enlargement whereas the incumbents face only negligible effects. The EU1 corresponds with the basic simulation of Baldwin et al. (1997)⁴.

In scenario EU2, where the Armington elasticities were doubled, the real output increases in Poland from 0.356 to 0.484 percent. The growth gain, in terms of real GDP growth, increases considerably when all the integration effects (more competition and increased total factor productivity) are assumed in the scenario EU3.

Table 4 GDP effects of EU-enlargement and EU-RF free trade agreement

qgdp	eu1	eu2	eu3	RU1	RU2	RU3
Finland	-0.006	-0.004	-0.003	0.062	0.058	0.060
Germany	0.003	0.005	0.006	0.018	0.017	0.018
Russia	0.019	0.023	0.024	0.235	0.236	1.297
Estonia	0.061	0.095	1.143	0.031	0.034	0.034
Poland	0.356	0.484	1.590	0.042	0.036	0.037
rest New EU	0.086	0.118	1.182	0.038	0.047	0.049
rest FSU	0.032	0.044	0.045	-0.087	-0.086	-0.079
rest EU	0.001	0.002	0.002	0.008	0.007	0.008
ROW	0.000	0.000	0.000	0.000	0.000	0.000

⁴ Baldwin et al. estimated that the effect of the eastern enlargement on CEECs is 1.5 per cent. Also Havlik (2002) argue that this overestimates the impact since Europe Agreements have gradually diminished trade barriers.

The simulation results suggest that the impact of eastern enlargement on Russian Federation (RUS) and the rest of the world are very small. This suggests that the fear of Russia's marginalization⁵ due to eastern enlargement does not get support from the results.

With regard to the EU25 and Russian FTA scenarios (RU1-RU3) the impact for the rest of the CIS⁶ countries (restFSU) is small, but negative. The restFSU countries experience negative welfare effects (see table below) due to the EU25-Russian FTA agreement, which reflects the worsening of their terms of trade and trade diversion effects.

In earlier paper, in which we utilized the GTAP database version 5.0 in which Russia was part of the Former Soviet Union (FSU) block. Then the EU15 member states experienced negative effects in the face of the EU-FSU FTA agreement with an exception of Finland. Both EU-South and EU-North regions and also Germany lost in terms of real gdp growth. It turned out that, in absolute terms, the losses were in these cases bigger than the gains that followed from the eastern enlargement. For the EU15 member states the effects were small but for the CEECs the negative impact of EUCIS FTA was considerable.

In the current study these results do not hold. It seems that the EU25-Russian FTA is harmful for the Rest of the FSU. In the scenario where more elastic substitution between domestic and foreign goods and productivity growth in Russia is assumed the net effect for the new EU members remains positive. This suggests that the whole integration process (case RU3) which covers eastern EU-enlargement and EU25-Russia free trade area with full integration effects has a positive output effect for Finland, the CEEC group and rest of the EU countries and negative output effect for the rest of the FSU.

Equivalent variation

GTAP model computes money metric equivalent of aggregate per capita utility for a region (using the regional household's utility function). The regional household's Equivalent Variation (EV) is equal to the difference between the expenditure required to obtain the new, post-simulation level of utility at initial prices.

Table 5 Welfare effects of EU-enlargement and EU-RF free trade agreement, mill. USD

EV	eu1	eu2	eu3	RU1	RU2	RU3
FIN	-14.43	0.02	4.31	285.30	256.81	267.59
GER	296.64	551.48	606.60	1343.71	1287.20	1347.88
RUS	186.92	232.15	267.31	-295.50	-272.25	2887.12
EST	7.75	7.94	57.09	46.58	40.93	42.08
POL	162.32	-126.83	1827.26	467.26	385.57	400.59
restNEWeu	-283.76	-862.76	939.59	545.88	521.95	548.93
RestFSU	217.77	287.72	288.80	-1029.82	-1023.17	-947.40
restEU	125.86	627.53	680.13	2139.27	2063.66	2167.50
ROW	280.49	758.52	701.82	-1950.67	-1734.54	-1872.95

⁵ Note that according to the simulations in Baldwin et al. (1997) Russia gains. One reason behind that is the fact that EU membership liberalizes CEECs trade policy regime towards Russia. Much of this effect has, however, already taken place. For a more recent situation, see discussion in Hamilton (2002).

⁶ Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Republic of Moldova, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

Equivalent variation indicates that in the EU enlargement scenario (EU1) the rest of the new EU (restNEWeu) group is in fact worse off due the enlargement. For this group an allocative efficiency component⁷ of the EV is positive (345.7 in the EU1 scenario) but at the same time the terms of trade component of the EV is negative (-731.1) for restNEWeu, indicating that the worsening of terms of trade was the main source for the welfare loss.

In the Russian-EU25 FTA scenarios (RU1-RU3) we see that only in the case where both increased import substitutability and increased productivity in Russia (RU3) are assumed the FTA agreement is welfare increasing for Russia. The rest of the FSU group, on the other hand, faces welfare losses, which reflects trade diversion effects for the group.

Export and Import volumes

Trade effects of both EU- and RU-scenarios are large for the new EU members and Russia respectively. One exception is Estonia, which to start with faced relatively the smallest tariff changes due to the EU membership.

Table 6 The effects of EU-enlargement and EU-RF free trade agreement on exports, %

Qxwreg	eu1	eu2	eu3	RU1	RU2	RU3
FIN	0.00	0.02	0.05	-0.08	0.29	0.30
GER	0.12	0.37	0.40	0.00	0.13	0.14
RUS	0.10	0.11	0.12	4.33	4.33	4.23
EST	0.38	0.98	1.73	0.27	0.90	0.91
POL	5.59	10.66	10.60	-0.25	0.45	0.45
restNEWeu	3.49	6.57	7.11	-0.15	0.11	0.11
RestFSU	0.33	0.43	0.46	0.05	0.06	0.01
restEU	0.07	0.17	0.19	0.03	0.11	0.12
ROW	0.05	0.06	0.08	0.04	0.04	0.06

Table 7 The effects of EU-enlargement and EU-RF free trade agreement on imports, %

Qiwreg	eu1	eu2	eu3	RU1	RU2	RU3
FIN	-0.05	0.02	0.06	0.68	1.07	1.10
GER	0.19	0.52	0.55	0.20	0.32	0.33
RUS	0.32	0.39	0.41	8.59	8.63	10.30
EST	0.54	1.13	1.88	1.26	1.79	1.82
POL	4.80	7.59	8.87	0.91	1.27	1.29
restNEWeu	4.52	6.72	7.61	0.41	0.61	0.62
RestFSU	0.79	1.03	1.05	-2.68	-2.66	-2.53
restEU	0.05	0.18	0.20	0.11	0.19	0.19
ROW	0.00	0.02	0.01	-0.08	-0.07	-0.08

Eastern enlargement has significant impact on the new EU members' trade. Below table indicates sectoral output change in Poland. EU-enlargement has significant negative ef-

⁷ Welfare increased due to the fact that sectors of production where tax/tariff distortions are relatively highest (mainly agriculture) reduced their relative share in total production. In other words if you decrease a tax or subsidy, or decrease output of a distorted sector, you will increase the allocative efficiency.

fect on the Polish agriculture, especially in the EU2 and EU3 scenarios (percentage changes may be large for some sectors which have relative small total output share, unlike agriculture in Poland). The Russian-EU25 scenario harms Polish coal production to some extent.

Table 8 Industry output of commodity i in Poland

qo[*POL]	eu1	eu2	eu3	RU1	RU2	RU3
AGRI	-0.74	-4.35	-3.65	0.30	0.29	0.29
Oil	0.16	0.78	1.81	-2.03	-2.20	-2.32
GAS	-0.41	-0.31	0.66	1.78	1.69	1.69
Coal	-0.66	-1.06	-0.12	-0.29	-0.26	-0.26
Textile	-1.16	-1.46	-1.00	-0.23	-0.11	-0.13
Wood	-0.11	2.02	2.41	-0.74	-0.48	-0.48
Paper	-0.11	0.89	1.75	-0.19	-0.19	-0.17
Mineral	0.42	2.01	3.03	0.15	0.11	0.15
ELEC	0.98	3.77	4.73	-0.59	-0.53	-0.58
ChemProd	-0.96	-0.86	-0.06	0.49	0.42	0.45
Metals	1.12	2.74	3.38	-0.75	-0.63	-0.63
Const	1.10	0.86	2.66	0.47	0.38	0.37
Trade	0.11	0.23	1.49	0.13	0.11	0.11
Transport	0.35	1.24	2.06	-0.19	-0.12	-0.12
Mnfcs	0.70	2.91	3.77	-0.64	-0.57	-0.59
Svces	-1.97	-4.06	-3.06	-0.06	-0.05	-0.06
OthServ	-0.08	0.27	1.50	0.01	-0.01	-0.01
CGDS	1.59	0.98	3.14	0.72	0.58	0.57

Terms of trade

Table 9 below gives the terms of trade effects. For the enlargement scenarios we expect that EU member states face an improvement of terms of trade. The results confirm this with exception of EU1, where Finland face a small terms of trade deterioration.

Table 9 The effects of EU-enlargement and EU-RF free trade agreement on terms-of-trade, %

Tot	eu1	eu2	eu3	RU1	RU2	RU3
FIN	-0.02	0.00	0.01	0.54	0.48	0.50
GER	0.04	0.07	0.08	0.18	0.17	0.18
RUS	0.16	0.20	0.24	-1.25	-1.22	-1.29
EST	0.08	0.05	-0.10	0.78	0.67	0.69
POL	-0.83	-1.74	-1.71	0.68	0.55	0.58
restNEWeu	-0.32	-0.79	-0.87	0.35	0.32	0.34
RestFSU	0.34	0.45	0.45	-1.65	-1.64	-1.52
restEU	0.00	0.02	0.03	0.08	0.08	0.09
ROW	0.00	0.01	0.01	-0.04	-0.04	-0.04

6 Discussion

In this paper, we have simulated the economic effects of eastern enlargement and the EU-Russia free trade area. The main emphasis of the paper is in effects to Russian

economy. The simulations were carried out with GTAP computable general equilibrium model using the most recent GTAP database 6.0beta, which takes the former Europe agreements between the EU15 and eight new CEE-members into account.

We distinguished between three variants of dealing with integration effects. The baseline integration scenarios (the eastern enlargement or the EU-Russia free trade area) cover only reductions in trade barriers. Then, as second stage, we assumed increased substitution between import goods and their domestic counterparts. The third pair of simulations assumed improved productivity in either the new EU member states (eastern enlargement) or the new EU member states and Russia (the EU-Russia free trade area).

The eastern enlargement scenarios confirmed the usual result that the incumbent EU countries gain very little. This seems to hold also for the new member states, which contrast the earlier findings. Equivalent variation even turns negative without improved productivity assumption. It seems that already the Europe agreements brought the major part of the gains for the new member states.

When interpreting the results in the FTA scenarios one should bear in mind that now the point of reference is the equilibrium database that corresponds to the post EU- enlargement simulation. In the EU enlargement case the point of reference was the base year equilibrium of the GTAP database 6.0 beta, corresponding to year 2001.

Ex-ante one would expect that the FTA agreement will affect relatively little the EU25 economies. Russian real GDP is about 10 % of the enlarged EU's real GDP. The size of the Russian economy is roughly the same as the new members' total economy. Trade between Russia and EU is also asymmetric. EU exports to Russia mainly manufactured goods while half of Russian exports to the EU consist of energy and raw materials.

In the RU1-RU3 scenarios the rest of the CIS countries (RestFSU) face a negative impact, which is not surprising. Interestingly, Russia too faces negative welfare effects in the RU1 and RU2 simulations. Only in the RU3 simulation where there are 'full integration' effects (increased product substitutability and productivity gains) in Russia the FTA agreement is beneficial.

The magnitude of trade effects due to EU25-Russian free trade area are almost of the same magnitude as the accession alone. On one side this suggests that trade creation effects are considerable but as there is almost no change in the rest of the world's trade, trade diversion seems evident as well.

Regarding EU25-Russian free trade area the current EU countries and the new members face qualitatively similar terms of trade effects. Notably Russia's terms of trade is deteriorating, as it is the case for the rest of the FSU as well. This seems to be the major contributor to negative welfare effects that these areas face.

From the EU25's and Russia's point of view the EU-Russia free trade area is, like the eastern enlargement, slightly beneficial in output sense but not necessarily in welfare sense. If significant improvement in productivity in Russia is assumed it obtains economic welfare gains from free trade agreement with the EU25 in both senses. The only region that loses from the agreement in output sense is the rest of the FSU. If equivalent variation is used for evaluation also the rest of the World is losing.

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