ECONOMIC EFFECTS OF FREE TRADE BETWEEN THE EU AND RUSSIA

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Economic Effects of Free Trade between the EU and Russia

Pekka Sulamaa and Mika Widgrén

Abstract

This study simulates the economic effects of eastern enlargement of the EU and an EU-Russian free trade area. The main emphasis of the paper is on the effect this would have on the Russian economy. The simulations were carried out with a GTAP computable general equilibrium model, using the most recent GTAP database 6.0 beta, which takes the former Europe agreements between the EU-15 and the eight new Central and Eastern European member states into account. The results confirm the earlier findings that a 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 the deterioration that would occur in Russia's terms of trade. Improved productivity in Russia would, however, make the free trade agreement with the EU advantageous.

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1. Introduction

The EU enlargement process has changed European trade relations. A common fear related to the wider EU is that it potentially marginalises European economies that currently are or will be left outside deeper and wider integration. As the major part of the continent belongs to the EU's trade policy regime the question of how the enlarged EU organises its trade relations with the rest of the continent becomes more important. One of the key issues in this respect is the relationship between the EU and the Russian Federation (RF). The legal basis for EU relations with Russia is 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 area agreement. In this paper, we examine the economic effects of the widening and deepening of EU–RF integration. The eastern enlargement, which widened the internal market (IM) to an area having almost twice as many consumers as the US, has an important impact on Russia. The enlarged Europe accounts for over 50% of the RF's exports and imports. Economic development in the European markets can therefore have major effects on the Russian economy through the trade linkages.

Eastern enlargement is likely to affect Russian trade in at least three ways. First, lower trade barriers within the IM divert imports from Russia to intra-IM trade. That is because lower trade barriers within the IM favour internal market-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 a welfare loss. The effect is likely to be rather small, however, since trade between the current incumbent member states and candidate countries is relatively free owing to the 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 stimulate trade. This gives an additional welfare gain to the EU countries but may also contribute positively to the Russian domestic economy. In fact, there is some evidence that EU integration has also stimulated external trade 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, the latter having to adopt the EU norm after accession. The direct total effect on the Russian economy is the sum of these three effects.

Lower trade barriers within the EU intensify intra-IM substitution and improve the efficiency of EU-based firms. As trade barriers between candidate countries and the EU are already quite low, improved substitution is likely to have a much more substantial role in shaping events than the direct effects from removing visible trade barriers.

Eastern enlargement may also marginalise the Russian economy through foreign direct investment (FDI). Full membership gives the Central and Eastern European countries (CEECs) a more favourable position as host countries for FDI relative to Russia 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, EU eastern enlargement and a free trade area (FTA) between the enlarged EU and the RF.

In each scenario, we have three sub-scenarios. First, there is the scenario where trade is liberalised, i.e. the base enlargement or the 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 as arguing that deeper integration decreases market segmentation. Our third scenario adds productivity growth to this, which may be the result of more intensified competition or increased FDI.

The rest of the paper is organised as follows. Section 2 describes the current state of affairs in trade relations between the EU and Russia. Section 3 presents the model and describes the level of aggregation and other assumptions we have made. Section 4 describes the simulations more carefully. Section 5 reveals the results and finally, section 6 concludes.

2.   Asymmetric partners

The EU's eastern enlargement (the incumbent EU-15 plus the 10 new member states or EU-10) and the EU–Russian cooperation involve the interaction of two fairly asymmetric trading blocs, both in terms of size and the structure of their economies. Taken together, the total output of the new EU member states is roughly 4% of that of the EU-15.[1] Russia's position *vis-à-vis* the EU-25 is similar. Figure 1 shows the GDP expenditure components of the EU-10 and Russia. Russia's economic size is roughly the size of the combined GDP of the new EU-10 economies.

Figure 1. GDP expenditure components in the EU-10 and Russia (in $US millions)
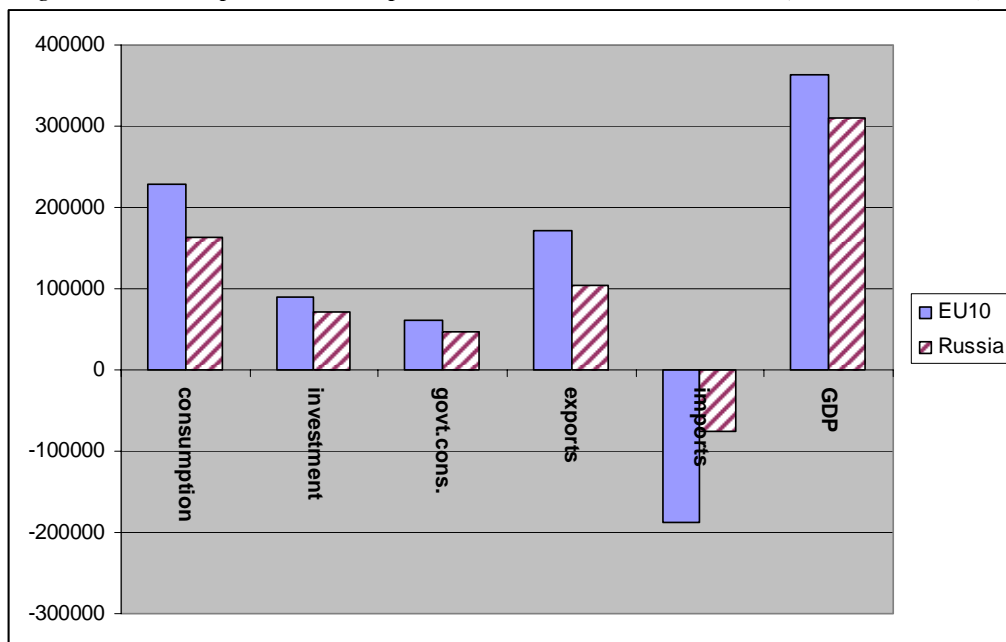
Source: GTAP database 6.0.

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[1] This figure was derived from the GTAP database version 6.0, which is based on 2001 data.

The GDP share of agricultural production in the new member states is nearly twice as high as the EU-15 average, while the per capita GDP in the new member states is nearly three times lower. Figure 2 illustrates the sources of total factor income (the 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 the agricultural and construction sectors in Russia. In Poland, the agricultural, trade and manufacturing sectors are notably more important income sources in relative terms.

Figure 2. Sources of total factor income by sector in selected countries (%)
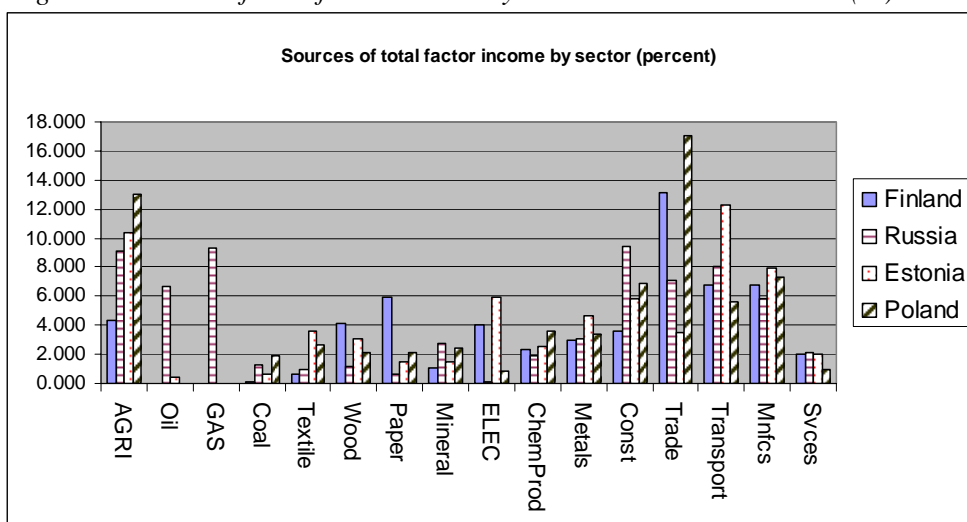
The level of trade protection varies between the new EU member states, the EU-15 and Russia. The new GTAP 6.0 beta database takes into account the Europe Agreements – the bilateral trade agreements that were concluded between the new EU member states and the EU-15 countries. Thus the effects from the EU enlargement scenario come mainly from the change in the common external tariff (CET) and changes in the import tariffs on agricultural products. Table 1[2] reports the import tariff changes for agricultural products in the EU enlargement scenario.

Table 1. Import tariff changes for agricultural products (%)

	Finland	Germany	Russia	Estonia	Poland	Rest new EU	Rest FSU	Rest EU
Finland	0.00	0.00	0.00	-9.085	-33.267	-17.449	0.00	0.00
Germany	0.00	0.00	0.00	-10.700	-21.448	-11.752	0.00	0.00
Russian Fed.	0.00	0.00	0.00	-5.861	-12.846	-9.697	0.00	0.00
Estonia	-4.384	-24.152	0.00	0.00	0.00	0.00	0.00	-19.445
Poland	-9.422	-8.901	0.00	0.00	0.00	0.00	0.00	-13.828
Rest of new EU	-9.606	-10.047	0.00	0.00	0.00	0.00	0.00	-12.771
Rest of FSU	0.00	0.00	0.00	-10.099	-16.919	-7.011	0.00	0.00
Rest of EU	0.00	0.00	0.00	-8.112	-18.489	-12.794	0.00	0.00
ROW	0.00	0.00	0.00	-0.935	-17.784	-11.101	0.00	0.00

Notes: Change in tax on imports of agriculture from *r* into *s*.

Source: GTAP database (version 6.0 beta) and authors' calculations.

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[2] Tables 1, 2 and 3 show what percentage change in powers is needed to move the tariff rates to zero within the EU. For example, to eliminate the 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 the power of tariffs needed to abolish the tariffs within the trade union (TU) or to conform to the EU's external tariffs.

An FTA agreement between the EU and Russia implies a relatively larger tariff reduction to Russia than to the EU. Tables 2 and 3 indicate the percentage changes in import tariff powers.

Table 2. Change in tax on imports from Russia into selected regions (%)

tms[*RUS*]	Finland	Germany	Estonia	Poland	rest New EU	rest FSU	rest EU	ROW
AGRI	-6.46	-6.30	-1.08	-1.08	-1.08	0.00	-5.94	0.00
Oil	0.00	0.00	-0.99	-0.99	-0.99	0.00	-0.72	0.00
GAS	0.00	0.00	-0.99	-0.99	-0.99	0.00	-0.08	0.00
Coal	0.00	0.00	-0.99	-0.99	-0.99	0.00	0.00	0.00
Textile	-7.91	-7.93	-1.04	-1.04	-1.04	0.00	-5.20	0.00
Wood	-0.09	-0.31	-1.00	-1.00	-1.00	0.00	-0.43	0.00
Paper	0.00	0.00	-0.99	-0.99	-0.99	0.00	-0.05	0.00
Mineral	-0.35	-0.49	-1.00	-1.00	-1.00	0.00	-0.98	0.00
ELEC	-0.10	-0.02	-1.00	-1.00	-1.00	0.00	-0.11	0.00
ChemProd	-1.85	-2.06	-1.01	-1.01	-1.01	0.00	-2.53	0.00
Metals	-1.04	-1.38	-1.01	-1.01	-1.01	0.00	-1.59	0.00
Const	0.00	0.00	-0.99	-0.99	-0.99	0.00	0.00	0.00
Trade	0.00	0.00	-0.99	-0.99	-0.99	0.00	0.00	0.00
Transport	0.00	0.00	-0.99	-0.99	-0.99	0.00	0.00	0.00
Mnfcs	-0.19	-0.46	-1.01	-1.01	-1.01	0.00	-0.48	0.00
Svces	0.00	0.00	-0.99	-0.99	-0.99	0.00	0.00	0.00
OthServ	0.00	0.00	-0.99	-0.99	-0.99	0.00	0.00	0.00

Source: GTAP database (version 6.0 beta) and authors' calculations.

Table 3. Change in tax on imports from selected regions to Russia (%)

tms[**RUS]	Finland	Germany	Estonia	Poland	rest New EU	rest FSU	rest EU	ROW
AGRI	-11.38	-12.43	-8.62	-13.72	-11.62	0.00	-12.39	0.00
Oil	0.00	0.00	0.00	0.00	0.00	0.00	-0.18	0.00
GAS	0.00	-4.76	0.00	0.00	0.00	0.00	0.00	0.00
Coal	0.00	-4.76	-4.76	0.00	0.00	0.00	-2.70	0.00
Textile	-13.74	-14.23	-12.06	-14.86	-12.37	0.00	-14.52	0.00
Wood	-15.95	-15.39	-14.80	-15.42	-15.12	0.00	-16.15	0.00
Paper	-9.19	-9.38	-9.97	-6.88	-5.81	0.00	-8.35	0.00
Mineral	-10.75	-12.36	-11.66	-12.97	-12.94	0.00	-12.90	0.00
ELEC	-6.90	-6.22	-6.52	-9.03	-5.46	0.00	-6.11	0.00
ChemProd	-7.88	-8.83	-8.33	-10.83	-9.12	0.00	-8.47	0.00
Metals	-10.17	-11.57	-7.40	-11.99	-10.93	0.00	-10.25	0.00
Const	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transport	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mnfcs	-8.51	-9.58	-10.65	-8.69	-9.24	0.00	-8.99	0.00
Svces	-4.60	0.00	-4.74	0.00	-1.81	0.00	-0.13	0.00
OthServ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: GTAP database (version 6.0 beta) and authors' calculations.

3.   The GTAP model and database

The Global Trade Analysis Project (GTAP)[3] model is a multi-regional, 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, the structure of production, consumption and intermediate use of commodities and services. The latest version of the database, GTAP 6.0 beta,[4] includes 87 different regions and 57 different sectors of production.

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[3] For further details, see http://www.gtap.agecon.purdue.edu.
[4] Compared with 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

The standard GTAP CGE model assumes 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.

The GTAP model computes the 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) 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 (it is possible to disaggregate into skilled and non-skilled labour), 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 briefly present the main building block of the model.

The 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 the 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 it is more parsimonious in its parameter requirements than functional flexible forms. It can also be shown that the constant elasticity of substitution (CES) function and the Cobb-Douglas preferences 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.

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 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, the sluggishness of some factors is allowed so that it is possible for factor prices to not 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.

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introduced are: Albania, Bulgaria, Croatia, Cyprus, the Czech Republic, Malta, Romania, Slovakia, Slovenia, Estonia, Latvia, Lithuania and the Russian Federation.

Labour and capital are mobile across domestic sectors, while land is assumed to only be used in agricultural sectors. As noted above, 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 the 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 on a costless basis.

The GTAP model does not contain a financial sector. An investment is therefore represented by a unique investment good, which 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, however, to general equilibrium analyses of an FDI-related increase in a region's capital stock as well as technology spillover.

The macro framework

In the GTAP model, private households and government are treated as a single decision-making economic agent, represented by 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 these 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 the 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

As previously mentioned, 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. Since the emphasis of this analysis is on the EU–Russian relationship, eight out of nine regions stem from this. Estonia, Finland, Germany, Poland and the Russian Federation are included as own regions and the rest of the EU-10 and the EU-15 are assembled as two separate groups.

The aggregation of 57 sectors of production into 17 to some extent reflects the importance of different sectors for the Russian economy. The complete sectoral and regional aggregations are available from the authors upon request. The main focus of this paper, however, is the aggregate effects; a detailed analysis of the effects on production sectors is left for future research.

4. Policy scenarios

Impact of the EU's 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 the rest of the new members; henceforth this whole group is referred in the text as the CEEC group) are abolished, and the EU average 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 the EU, which reflects a higher degree of protection in the new member states.

EU2: EU enlargement and the 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 a further effect on these economies through trade, FDI, domestic investment, etc. Thus, it is fair to say that the above simulation somewhat underestimates the long-term impact of the enlargement. Accession to the internal market means that the number of administrative barriers to trade, as well as the number of technical barriers of trade (minimum requirements, harmonisation of rules and regulations, etc.), is reduced. Furthermore, it may be argued that risk and uncertainty will be mitigated by the accession of the CEEC group to the EU.

In order to take into account some of these integration effects, we did a second EU enlargement simulation with a 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 assumption 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 goods within the customs union, we hope to capture some of the IM effects that further encourage trade within the area. In fact, this scenario attempts to capture reduced-market segmentation, which is likely as the internal market removes non-visible trade barriers.

The simulation with increased Armington elasticity values involved re-specifying the old commodity-specific elasticity value vector into a 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 customs union. The model stability with respect to the elasticity values was checked by doing a series of simulations with less dramatic increases in the elasticity values. The results showed that in qualitative terms the smaller increases were consistent with the reported case.

EU3: EU enlargement and total factor productivity increase within the CEECs

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

Jensen, et al. (2004) analyse the medium-term effects of Russia joining the WTO and found that the gains originate mainly from an FDI liberalisation in services (70% of the gains).

RU1: A free trade area between the enlarged EU and the Russian Federation

The 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 a factor productivity increase in the former Soviet Union, or FSU). The main difference here of course is that there is no CET constraint on the FSU. These simulations are labelled as RU1, RU2 (Armington) and RU3 (RU2 + a factor productivity increase in Russia). In the RU2 scenario we doubled Armington elasticities within the EU-25 + Russia regions.

When interpreting the results in the free-trade-area 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, i.e. 2001.

5.   Simulation results of the EU enlargement and the EU-25–Russian FTA scenarios

Abolishing trade barriers directly affects 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 countries can better exploit the gains from trade. Trade creation involves a reallocation of production between different regions, leading to efficiency improvements in overall production. Furthermore, the elimination of trade barriers affects terms of trade, i.e. the price of exports relative to imports. Abolishing import tariffs will improve terms of trade for countries that export their goods to that market. Although such terms-of-trade improvements may harm domestic production, it can improve welfare owing to a rise in the value of its produced goods relative to imported goods.

All results are reported in terms of percentage changes compared to the relevant reference. In the case of 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 to 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 4 gives the simulation results on total output (real GDP percentage changes). In Table 4 and Tables 6-9 the EU1 to EU3 figures are percentage changes from the GTAP base year 2001 data values, while the RU1-RU3 figures are changes with respect to the database that corresponds to the EU1 scenario (EU enlargement has taken place).

In the EU enlargement scenarios (EU1 to EU3) we find that the most significant effects are, as expected, on Poland (0.3 to 1.6%), Estonia (0.06 to 1.2%) and the rest of the new members (0.09 to 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 would face only negligible effects. The EU1 enlargement scenario corresponds with the basic simulations by Baldwin et al. (1997).[5]

In scenario EU2, where the Armington elasticities were doubled, the real output increases in Poland from 0.356 to 0.484%. 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 scenario EU3.

Table 4. GDP effects of EU enlargement and an 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 of new EU	0.086	0.118	1.182	0.038	0.047	0.049
Rest of FSU	0.032	0.044	0.045	-0.087	-0.086	-0.079
Rest of 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

Source: GTAP database (version 6.0 beta) and authors' calculations.

The simulation results suggest that the impact of eastern enlargement on the Russian Federation (RF in Tables 5-9) and the rest of the world are very small. This suggests that the fear of Russia's marginalisation[6] as a result of the EU's eastern enlargement is not supported by the results.

With regard to the EU-25 and the Russian FTA scenarios (RU1–RU3) the impact for the rest of the countries that comprise the Commonwealth of Independent States (CIS)[7] (shown in the tables as the rest of the FSU) is small, but negative. The rest of the FSU countries experience negative welfare effects (see Table 5 in the discussion on equivalent variation below) owing to the EU-25–Russian free trade agreement, which reflects the worsening of their terms of trade along with the effects of trade diversion.

In an earlier paper, we utilised the GTAP database version 5.0 and Russia was part of the FSU bloc. Then the EU-15 member states experienced negative effects in the face of an EU–FSU free trade agreement with the exception of Finland. Both the EU's southern and northern regions as well as 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 eastern enlargement. For the EU-15 member states, the effects were small but for the CEECs the negative impact of an EU–CIS free trade area was considerable.

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[5] Baldwin et al. (1997) estimated that the effect of the eastern enlargement on the CEECs is 1.5%. Yet Havlik (2002) argues that this overestimates the impact since the Europe Agreements have gradually diminished trade barriers.

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

[7] The CIS is made up of Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, the Republic of Moldova, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

In the current study these results do not hold. It seems that the EU-25–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 are assumed, the net effect for the new EU member states remains positive. This suggests that the whole integration process (case RU3, which covers eastern EU enlargement and an EU-25–Russian free trade area with full integration effects) has a positive output effect for Finland, the CEEC group and the rest of the EU countries and negative output effect for the rest of the FSU.

Equivalent variation

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

The EV indicates that in the EU enlargement scenario (EU1) the group comprising the rest of the new EU member states is in fact worse off as a result of the enlargement (Table 5). For this group, an allocative efficiency component[8] 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 the rest of the new EU member states, indicating that the worsening of terms of trade was the main source of the welfare loss.

Table 5. Welfare effects of the EU enlargement and an EU–RF free trade agreement ($US million)

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
RF	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
Rest of new EU	-283.76	-862.76	939.59	545.88	521.95	548.93
Rest of FSU	217.77	287.72	288.80	-1029.82	-1023.17	-947.40
Rest of EU	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

Source: GTAP database (version 6.0 beta) and authors' calculations.

In the EU-25–Russian FTA scenarios (RU1–RU3) we see that only in the case where both increased import substitutability and increased productivity in Russia (RU3) are assumed would the FTA agreement increase welfare in Russia. The rest of the former Soviet Union group, on the other hand, would experience welfare losses, which reflects trade-diversion effects for the group.

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[8] Welfare would be increased owing to the fact that the sectors of production where tax/tariff distortions are relatively high (mainly agriculture) would be reduced as to their relative share in total production. In other words, if one decreases a tax or subsidy, or decreases the output of a distorted sector, the allocative efficiency will increase.

Export and import volumes

Trade effects of the EU and RU scenarios are large for both the new EU member states and Russia (Tables 6 and 7). One exception is Estonia, which initially enjoyed the relatively smallest tariff changes arising from EU membership.

Table 6. The effects of EU enlargement and an 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
RF	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
Rest of new EU	3.49	6.57	7.11	-0.15	0.11	0.11
Rest of FSU	0.33	0.43	0.46	0.05	0.06	0.01
Rest of EU	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

Source: GTAP database (version 6.0 beta) and authors' calculations.

Table 7. The effects of EU enlargement and the 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
RF	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
Rest of new EU	4.52	6.72	7.61	0.41	0.61	0.62
Rest of FSU	0.79	1.03	1.05	-2.68	-2.66	-2.53
Rest of EU	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

Source: GTAP database (version 6.0 beta) and authors' calculations.

Eastern enlargement has a significant impact on the trade of the new EU member states, as shown in the sectoral output change in Poland (Table 8). EU enlargement would have a significant negative effect on Polish agriculture, especially in the EU2 and EU3 scenarios (percentage changes may be large for some sectors that have a relatively small total output share, unlike agriculture in Poland). The EU-25–Russian scenario would also harm Polish coal production to some extent.

Table 8. Industry output of commodity i *in Poland (output changes)*

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
Chem. prod.	-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
Services	-1.97	-4.06	-3.06	-0.06	-0.05	-0.06
Other serv.	-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

Note: CGDS refers to capital good sector – change in capital good production.

Source: GTAP database (version 6.0 beta) and authors' calculations.

Terms of trade

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

Table 9. The effects of EU enlargement and an EU–RF free trade agreement on terms-of-trade (%)

Terms of trade	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
RF	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
Rest of new EU	-0.32	-0.79	-0.87	0.35	0.32	0.34
Rest of FSU	0.34	0.45	0.45	-1.65	-1.64	-1.52
Rest of EU	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

Source: GTAP database (version 6.0 beta) and authors' calculations.

6. Conclusions

In this paper, we have simulated the economic effects of eastern enlargement and an EU–Russian free trade area. The main emphasis of the paper is the effect this would have on the Russian economy. The simulations were carried out with a GTAP computable general equilibrium model using the most recent GTAP database 6.0 beta, which takes the former Europe Agreements between the EU-15 and eight new CEECs into account.

We distinguished between three variants for projecting the effects of integration. The baseline integration scenarios (eastern enlargement or the EU–Russian free trade area) cover only reductions in trade barriers. Then, as a second stage, we assumed the 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 in the new EU member states and Russia (the EU–Russian free trade area).

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

When interpreting the results of 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 a free trade agreement would have relatively little effect on the EU-25 economies. The real GDP in Russia is about 10% of the enlarged EU's real GDP. The size of the Russian economy is roughly the same as the total economy of the new member states. Trade between Russia and the EU is also asymmetric. The EU's exports to Russia are mainly manufactured goods, while half of Russia's exports to the EU consist of energy and raw materials.

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

The magnitude of the trade effects owing to an EU-25–Russian free trade area are almost of the same magnitude as the accession alone. On the one hand, this finding suggests that the trade creation effects are considerable; but as there is almost no change in the trade of rest of the world, trade diversion seems evident as well.

Regarding the EU-25–Russian free trade area, the current EU countries and the new member states would experience qualitatively similar terms-of-trade effects. Notably, Russia's terms of trade are deteriorating, as is the case for the rest of the FSU as well. This seems to be the major contributor to the negative welfare effects that these areas would face.

From the viewpoint of the EU-25 as well as that of Russia, the EU–Russian free trade area would, like the eastern enlargement, be slightly beneficial with regard to output but not necessarily in terms of welfare gains. If a significant improvement in productivity is assumed for Russia, it would obtain economic welfare gains from a free trade agreement with the EU-25 in both regards. The only region that loses from the agreement *vis-à-vis* output is the rest of the FSU. If equivalent variation is used for evaluation, the rest of the world would also lose.

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