

Trade patterns in the enlarged European Union

Alicia Gómez Tello^{*}

November 2011

PRELIMINARY AND INCOMPLETE

Abstract

This paper aims at assessing empirically the direction and the composition of exports between the European Union, above all the new accession countries, and Russia before and after the two last EU enlargements (2004 and 2007). We build a panel data at country level for the period 1999-2009 to estimate an augmented gravity equation. The results show that after the sixth enlargement (2004), it is not so clear that the CEECs diverted their principal trade destination from Russia to the EU15. Moreover, some interesting sectoral effects in driving export directions have been detected.

^{*}I am particularly grateful to R. Nicolini for their continuous encourage, support and advice. I will also like to thank F. Brunet, P.-Ph. Combes, S. Esteve, M. Lafourcade, C. López-Mayan, C. Nicodemo, the participants to the Applied Lunch Seminar at the UAB and the participants to the International Workshop on “Recent issues in European economic integration and EU enlargement” (Brussels) for helpful comments. All errors are my own. Corresponding author: Alicia Gómez Tello, Department of Applied Economics, Universitat Autònoma de Barcelona, Edifici B – Campus de la UAB, 08193 Bellaterra, Barcelona, Spain. Email: alicia.gomez@uab.cat

1. Introduction

“The theory of *economic integration* refers to the commercial policy of discriminatively reducing or eliminating trade barriers only among the nation joining together (Salvatore, 2010).” The European Union (EU) is one of the most complete integration processes. In 1995, after the fifth enlargement, the EU was composed by fifteen countries. With the two last enlargements (in 2004 and 2007 respectively) twelve new countries joined to the EU.¹ The last two enlargements affected in various ways the overall picture of the Union, above all the economic field. In particular, the last 12 EU members, mainly the Central and Eastern European countries (CEECs), have long traditional economic ties with their neighbors since most of them belonged to the Council for Mutual Economic Assistance bloc (CMEA or COMECON).² It is, therefore, crucial to understand how the last EU enlargements have affected, and will affect, the economic and social relationships with these countries. Since the 1990s economists were concerned about the possible consequences on integration between the Eastern and Western Europe. Mainly integration takes the form of increase labor mobility, trade or multinational operations (Abraham and Konings, 1999). In this paper we assume that integration takes the second form, that is, more trade. An interesting issue could be to analyze the impact of the two last enlargements on the intensity of trade between the new and the old EU members as well as between the EU countries and the EU neighboring countries.

The contribution of this paper is empirical. This paper aims at studying the effects of the two last enlargements on integration. That is, we analyze the direction and the composition of exports between the EU countries, above all the new accession countries, and Russia, before and after the two last enlargements. Our purpose is to investigate whether the last EU members diverted their exports from Russia to the EU15.³

Russia, as leader of the former Soviet Union, had much influence over the CEECs. On one hand, the Baltic countries took part of the Soviet Union. On the other hand, the Soviet Union, Bulgaria, the former Czechoslovakia, Hungary, Poland and Romania founded in

¹ See *Table 6*.

² Bulgaria, the former Czechoslovakia, Estonia, Latvia, Lithuania, Hungary, Poland and Romania were members of the COMECON block.

³ For all the paper we use EU15 (15 countries), last EU members (12 countries) and EU (27 countries).

1949 the COMECON bloc. These historical facts could still have effects on the current bilateral trade flows. Moreover, the physical distance between these countries and Russia is relatively small. From the point of view of the *gravity model*, the trade costs between the last EU members and Russia are smaller than the trade costs between the last EU members and the EU15. It suggests that the share of trade flows between the last EU members and Russia with respect to the total trade flows of the last EU members should be relatively high. But according to the *economic integration theory*, trade liberalization and factors production mobility between the EU members should contribute positively in the intensity of trade between the 27 countries. Nevertheless, the descriptive analysis about the export distribution of the last EU members presented in the *Section 4* depicts that the relative importance of Russia over the EU15 grew slightly in relative terms since 2003. For this reason a further analysis about the nature and intensity of the trade flows from the EU to Russia is needed.

The database used in this paper has been constructed using three different sources: the external trade data from the Eurostat database, the gross domestic product data from the World Economic Outlook database and the distance data from the CEPII database. From the Eurostat database we collect the annual exports by Standard International Trade Classification (SITC). The SITC classification⁴ is simplified in only six sectors: food and beverages, raw materials, chemicals, manufactured goods by material, machinery and transport equipment and other manufactured articles. Moreover, some dummy variables are included in order to assess the effect of the two last enlargements. We elaborate an augmented gravity model and we estimate a pooled OLS model with robust standard errors for each sector. We use two different specifications. In the former we study the export dynamics from the EU to Russia from 1999 to 2009. We use a balanced panel data (at country level) with 275 observations. In the latter we study the export dynamics from the last EU members to the EU and Russia for the same period. In this case we use a balanced panel data (at country level) with 2,640 observations.

In our study we are also overcoming some of the frequent limitations of the gravity approach. One of the most important econometric limits of the gravity models is the reverse

⁴ Revision 4

causality problem when estimating the impact of regional trade agreements on the intensity of trade flows between member countries. Countries often choose to sign a trade agreement because they expect large benefits. Geographical proximity, cultural ties and other factors facilitating bilateral trade make the prospect of such agreement more appealing. For this reason, that could be a source of bias in OLS estimates (Combes et al., 2008). Nevertheless, it is not a problem in the estimations of this paper because our objective is not to detect the effects of the two last enlargements on the intensity of trade flows within the EU. We target to estimate the effects of the two last enlargements on the direction of trade between the last EU members and a non-EU country, Russia. Hence, we are avoiding any conjecture about the canonical causality effect. Moreover, using country and time fixed in our econometric specification, we take into account the “*multilateral resistance*” terms defined by Anderson and vanWincoop (2003).

The results obtained from our empirical exercise confirm that the gravity model predictions work well. Nevertheless, after the sixth EU enlargement (2004), it is not so clear that the last EU members diverted their principal trade destination from Russia to the EU15. Some interesting sectoral effects appear. On the one hand, Russia is preferential destination for food and beverages, chemical and machinery. On the other hand, we detect an export diversion from Russia to the EU15 in the other three sectors: raw material, manufactured goods by material and other manufactured articles. Nevertheless the relative importance of these three sectors was low. Taking into account the whole period, these sectors represented approximately 30% of the total exports from the last EU members to Russia.

The study is organized as follows. *Section 2* provides a literature review and discusses some issues about the effects of integration between the Western and Eastern Europe and the application of the gravity technique. *Section 3* provides briefly a legislation review between the EU and Russia. *Section 4* explains shortly the main intuitions of the gravity model. *Section 5* provides interesting empirical evidence about the EU external trade distribution and describes the database and the most interesting statistics too. *Section 6* introduces the econometric strategy and discusses the results obtained. Finally *Section 7* concludes.

2. Literature review

During the 1990s various papers aimed at assessing the effects of the CEECs integration on labor mobility, trade and foreign direct investment (FDI). Most of the papers considered trade changes as the major effect of integration strategies. A few studies confirmed that, during the 1990s, the CEECs diverted their exports toward the EU countries from their previous COMECON partners. Nevertheless, the controversy was created because some studies confirmed that the trade integration between Western and Eastern Europe was complete before 2004 (Brenton and Gros, 1997; Abraham and Konings, 1999) while others concluded that the trade integration was not complete (Faucompret et al., 1998).

Brenton and Gros (1997) study the transition process of the CEECs and the former Soviet Union members after the dissolution of the USSR. They study the intra-OECD trade and they conclude that, in term of the geographical structure of their trade, the more advanced countries in the Central and Eastern Europe were indistinguishable from Western market economies. Hence, for the most advanced countries, they confirm a reorientation of trade away from the former COMECON partners and toward the Western countries (in particular the EU). Nevertheless, for the less advanced countries this adjustment of trade was far from complete. Abraham and Konings (1999) also consider a trade reorientation toward the Western Europe before 2004. They do not find high effects neither on labor mobility nor on FDI effects. Nevertheless, the share of the CEECs in total EU imports remained relatively small. In the same wave, Faucompret et al. (1998) consider that the trade reorientation during the 1900s was incomplete because the EU followed too restrictive trade policies with respect to the CEECs. They predict that the abolition of restricting measures (e.g., rules of origin and mandatory standards) would positively influence trade.

Most current papers study the effects of the two last EU enlargements. For example Crozet et al., (2004) focus on the relation between economic integration and the reallocation of economic activity within a country. Nevertheless, there are not contributions focusing on the trade effects after 2004, that is, after the complete economic integration of the CEECs into the EU.

From a methodological point of view, we use an augmented gravity model to estimate the export dynamics. The adoption of the gravity technique has yielded some interesting insights. A gravity model consists of two sets of variables, namely country-specification variables (e.g. the income levels of the importing and exporting country) and bilateral variables (e.g. the distance between the countries). Redding and Venables (2004) estimate a structural model of economic geography using cross-country data on per capita income, bilateral trade, and the relative price of manufacturing goods. They use a gravity equation with importer and exporter fixed effects (that is, using importer and exporter dummies) to estimate the market access and the market potential of each country. The bilateral trade costs are a function of the bilateral distance and a common border dummy.

3. Legislation context

The objective of this section is to comment briefly the evolution of the legislation between the EU and Russia, from the dissolution of the Soviet Union until the beginning of the 2000s. First, strong bilateral relationships between some EU members and Russia are commented. As a background we should keep in mind that the Union of Socialist Republic (USSR) was constitutionally socialist state between 1922 and 1991. In 1949 the USSR, Bulgaria, the former Czechoslovakia, Hungary, Poland and Romania founded the COMECON. The main goal of this organization was to establish a strong economic international relationship between the socialist countries. Among the 27 EU members only the Baltic countries (Estonia, Latvia and Lithuania) took part of the USSR. Since 1991 a large number of regional organizations and cooperating blocs were created for the post-Soviet countries. Nevertheless, the three Baltic countries did not take part in any of those post-Soviet organizations.

The Partnership and Co-operation Agreement (PCA) was the framework of the EU-Russia relationship for more than a decade. It was signed in 1994 and entered into force on December 1997. This agreement regulated the political and economical relations of the ex-USSR states with the EU. One of its main objectives was the promotion of trade and investment among its members. Nine years later, at the St. Petersburg Summit (May 2003), the EU and Russia agreed to reinforce their cooperation by creating, in the long term, four common spaces in the framework of the PCA: a common economic space, a common space

of freedom, security and justice, a space of co-operation in the field of external security and a space of research, education and cultural exchange. Among these spaces, the objective of the Common Economic Space (CES) is to create an open and integrated market between the EU and Russia. This space is intended to remove barriers to trade and investment and promote reforms and competitiveness, based on the principles on non-discrimination, transparency and good governance.⁵

However, some controversial situations between a few EU countries and Russia have occurred. Russia imposed a ban on Polish meat exports (from 2005 to 2007) due to allegations of low quality and unsafe meat exported from the country. For this reason, Poland reacted and blocked on a new bilateral treaty between the EU and Russia at the Samara Summit (May 2007). Also the Baltic countries reacted against these talks: Estonia complained of Russia cyber attacks on its government, media and banking websites, Lithuania faced a Russian oil blockade and Latvia opposed Russia's Baltic pipeline plan on environmental grounds (Rettman, 2007).

4. Gravity model

We are developing our empirical analysis on the basis of the gravity model. The rationality of our choice relies on the results obtained in the economic literature in which the gravity framework turns out successfully to describe the intensity of the trade between regions or countries. Moreover, the gravity model is a universal tool in the sense that many social and economic phenomena can be empirically described by it (e.g., migration flows, foreign direct investments and external trade). In fact, one of the most relevant results of the gravity model is the quality of its empirical predictions.

The formal study of the gravity model is very recent; Anderson and vanWincoop (2003) is the main reference for the more recent exploitations of the gravity equation.⁶ They are able to incorporate a theoretical model in order to complement the successful empirical results detected so far. The intuition of the model is straightforward: after controlling for the size, the trade intensity between two regions increases as their bilateral trade barriers drop with

⁵ <http://ec.europa.eu/trade/creating-opportunities/bilateral-relations/countries/russia/>

⁶ They extended Anderson (1979)'s work.

respect to the average barriers with other partners. They use the concept of “multilateral resistance” to define this idea in the sense that, the more resistant to trade with all their others a region is, the more it is pushed to trade with a given bilateral partner. By exploiting a general CES utility function⁷ they derive an operational gravity model which incorporate the “multilateral resistant” terms.⁸

In the canonical version of the gravity model, bilateral trade flows are positively correlated to the size of each partner and negatively affected by the level of trade costs. The size of the countries is often measured by the GDP while the trade costs are measured by the distance between countries. Denoting the GDP of country r by Y_r , the GDP of country s by Y_s , the exports from r to s by X_{rs} and the distance separating them by d_{rs} , the standard version of the gravity model can be written as follow:⁹

$$X_{rs} = G \frac{Y_r^\alpha Y_s^\beta}{d_{rs}^\delta} \quad (1)$$

where G , α , β , δ are parameters to be estimated. As we will see in *Section 6*, these parameters are often estimated using the log-linear transformation of the equation (1), and hence they can be interpreted as elasticities. The economic meaning of the exponential parameters is very important, so that these variables measure the sensitivity of trade to different concepts, for example δ is an indicator that measures the sensitivity of trade to the distance.¹⁰ Hence, the traditional version of the gravity model predicts geographical proximity between two countries as one of the principal determinant of the trade flows between them. The importer’s GDP is interpreted as the market potential.¹¹ The market potential captures the idea that being close to prosperous regions makes a region more attractive because it offers goods access to several large markets (Combes et al., 2008). Finally the exporter’s GDP determines the degree of competitiveness of the exporter country.

⁷ The most important assumptions of their model are: goods are differentiated by place of origin and symmetric barrier costs.

⁸ They derive a decomposition of trade resistance into three intuitive components: the bilateral trade barriers between region i and j , i ’s resistance to trade with all regions and j ’s resistance to trade with all regions.

⁹ Combes et al. (2008), Chapter 5

¹⁰ If the value of δ is high, the effect of distance on trade flows will be large.

¹¹ Harris (1954) defines the market potential of region r by the sum of regional GDPs, where the GDP of s is weighted by the inverse of its distance to region r .

Country size is a source of comparative advantage in the differentiated goods sectors because bigger countries can exploit more the scale economies.

5. Data description

In this section we discuss some empirical evidence concerning the EU external trade distribution. We present data and graphs about the external trade distribution by commercial partners, first by considering all the EU members and then by splitting the EU into two subgroups: the EU15 and the last EU members (See *table 6*).¹²

In *Table 1* we show the rank and the relative importance of some partner countries of the EU in merchandise trade for the period 2006-2009. The six major EU commercial partners represented more than 45% of the total EU external trade.¹³ For the whole period, USA, China and Russia were the most important trade partners. *Table 2* considers only these three major trade partners and shows the relative importance of each one for three different years (1999, 2004 and 2009).¹⁴ In 1999 more than 80% of the EU exports were to USA, while less than 20% of the EU exports were shared by China and Russia. The relative importance of USA decreased during the period; although in 2009 USA still received more than 50% of the EU exports. The trend of the EU exports destination is represented graphically in *Figure 1a*. The graph illustrates that the relative importance of USA slightly fell while the relative importance of the other two countries gradually rose along the period. *Table 2* also depicts the EU imports distribution. At the beginning of the period USA was the most important commercial partner (65% of the EU imports were from USA) while China and Russia represented 35% of the EU imports. The relative importance of USA went down whereas the relative importance of China and Russia grew during the period (for the case of Russia only until 2004). At the end of the period China was the most important commercial partner with a share of 44% of the EU imports, meanwhile USA and Russia represented 32% and 24% respectively. The trend of the EU imports origin is represented graphically in *Figure 1b*. The graph illustrates that the relative importance of

¹² Remember that we consider that the EU is formed by the 27 members, also in the years before the two last enlargements. For example, when we calculate the EU exports before 2004 we take into account the 27 countries. In this way, we study the evolution of the 27 members together.

¹³ The major trade partners were United States, China, Russia, Switzerland, Norway and Japan.

¹⁴ In this table we normalize the total EU exports (or EU imports) to these three countries to 100% to know more easily the evolutionary trend.

USA fell while the relative importance of the other two countries rose along the period, but in the case of Russia only until 2004 (it remained stable for five years).

Once described the evolution of the EU external trade distribution considering all the EU members, we move to study the EU external trade distribution considering two different EU subgroups, the EU15 and the last EU members. *Table 3a* describes the EU exports distribution by the mentioned EU subgroups for three different years (1999, 2004 and 2009). The relative importance of the last EU members was very low when the partners were USA or China. Nevertheless, the relative importance of that subgroup improved when Russia was the partner; moreover, this relative importance increased all the period (this subgroup accounted for 12.5% of the EU exports to Russia in 1999 while accounted for 20.5 in 2009). Simultaneously, *Table 3b* describes the EU imports distribution by the EU subgroups for the same years (1999, 2004 and 2009). The relative importance of the last EU members was higher when the partner was Russia, but the relative value remained stable along the period (approximately 25% of the total EU imports to Russia). Therefore, the two last enlargements had mostly effects in internal distribution of the EU exports to Russia (since 2004 the last EU members had more relative importance in the EU exports to Russia).

In the heart of the previous results, we focus on the composition of the last EU members' exports. *Table 4* illustrates the distribution of the last EU members' exports for 1999, 2004 and 2009. In the table only two potential buyers are considered, the EU15 and Russia.¹⁵ We are interested on checking whether the last two enlargements have affected the relative importance to Russia as destination country. At the beginning of the period there was a clear difference between the two destinations: the EU15 accounted for 97% of the total exports while Russia only accounted for 3%. Nevertheless, this large difference shrank at the end of the period: Russia gained 3 percentage points and accounted for 6% of the last EU members' exports in 2009. A more detailed description is included in *Figure 2*, where the ratio of the last EU members' export to the EU over the last EU members' exports to Russia is represented for the whole period. We can detect that the relative importance of

¹⁵ In this table it is assumed that the last EU members' exports to EU15 and Russia represented 100% (that is, the total exports).

Russia as destination country increased slightly from 1999 to 2001 (in 1999 the exports to the EU15 were 36 times higher than the export to Russia while in 2001 the exports to the EU15 were 31 times higher). It was constant for two years and it increased dramatically from 2003 to 2008 (in 2008 the EU15 were only 13 times higher than the exports to Russia). In order to understand this trend, a further analysis between the nature and intensity of the trade flows from the EU to Russia is required.

Finally, we describe briefly the external trade distribution from the Russia viewpoint. In *Table 5* we report the Russia external trade distribution by group of countries for three different years (1998, 2004 and 2009). The EU was the most important commercial partner in both export and import flows for the three years. In 2009 the EU accounted for 53.4% of total Russia exports and 45.5% of total Russia imports. It is widely known that Russia is a country rich in natural resources; in fact, Russia is endowed with the world's largest known reserve of natural gas.¹⁶ Russia is a major gas-exporter country while the EU is a major importer of Russia gas natural (Noel, 2008).

The empirical evidence we discussed in this section encloses the relevance of the purpose of this study, namely the effects of the two last enlargements on the integration process across EU countries. In order to achieve this issue, we propose the export dynamics from the EU to Russia.

5.1 Database

The database used in this paper has been constructed using different sources: the external trade data from the Eurostat database, the gross domestic product data from the World Economic Outlook database and the distance data from the CEPII database.

We use the external trade detailed data for the 27 EU members; particularly we use the annual exports data (in current Euros) by Standard International Trade Classification (SITC).¹⁷ Using the ten sections of the SITC we have built another classification with only six sectors (See *Table 7*): food and beverages, raw materials, chemicals, manufactured goods in terms of materials, machinery and transport equipments, and other manufactured

¹⁶ BP report (2008)

¹⁷ Available at http://epp.eurostat.ec.europa.eu/portal/page/portal/external_trade/data/database

articles. This simplified classification allows us to obtain clearer conclusions. The second data resource mentioned previously is the World Economic Outlook database. From this database we obtain the Gross Domestic Product (in current U.S. Dollars) from 1999 to 2009 for the EU countries and Russia.¹⁸ In order to have exports flows and gross domestic products in the same nominal currency (current USD) we use the annual bilateral exchange rate (EUR/USD)¹⁹ to convert the annual export from Euros to USD. The last important variable that we need to run the standard gravity equation is the distance across countries. We use the CEPII's bilateral data; particularly we use the variable “*dist*” that is available in the *dist_cepil.xls* file.²⁰ According to the CEPII's detailed notes (Mayer and Zignago, 2006) this variable has been calculated using the great circle formula,²¹ which uses latitudes and longitudes of the most important cities/agglomerations (in terms of population). The distance is expressed in kilometers.

In this paper we aim at assessing empirically the direction and the composition of exports between the EU countries, above all the last EU members, and Russia before and after the two last enlargements. Our purpose is to investigate on the potential changed in the commercial relationship between the last EU members and Russia after the two last enlargements. In order to do that we consider, on the one hand, the export flows from the EU to Russia and, on the other hand, the export flows from the last EU member to the EU and Russia.

5.2 Descriptive statistics

We proceed by proposing a descriptive analysis on the EU trade composition by sectors. In doing so, we detect not only the relative importance of each sector, but also the differences among countries and the changes over the period.

First we consider the annual export from the EU to Russia. *Table 8* describes the exports distribution by sectors for three different years (1999, 2003 and 2009). In 1999 the most important sector was machinery and transport equipments (35.88%) while the less

¹⁸ Available at <http://www.imf.org/external/ns/cs.aspx?id=28>

¹⁹ Available at http://epp.eurostat.ec.europa.eu/portal/page/portal/exchange_rates/data/database

²⁰ Available at <http://www.cepii.fr/anglaisgraph/bdd/distances.htm>

²¹ The great circle formula distance is the shortest distance between any two points on the surface of a sphere along a path on the surface of the sphere.

important sector was raw materials (2.13%). The second most important sector was food and beverages, which represented 18.87% of total exports. The other sectors, chemical, manufactured goods by material and other manufactured articles, represented 15.02%, 14.21% and 14.90% respectively. In 2004 there were significant changes. Machinery sector kept on being the most important sector (47.47%) and the raw materials one continued being the less important sector (1.78%). But the relative value of the food sector fell sharply: in 2004 it was the second less important sector representing only 8.92% of total exports. The relative order of the other three sectors was the same as in 1999, although their relative importance reduced slightly. In 2009 there were only some quantitative changes. In order to have a global idea about the relative importance of each sector in the total EU exports to Russia, we calculate the relative importance of each sector taking into account the whole period. The results are presented in a pie chart (*Figure 3*): the most important sector, with 47% of total exports, was machinery and transport equipments, followed by chemical (15%), the manufactured goods by material (13%) and other manufactured articles (15%). The less important sectors are the food and beverages and the raw materials, which represent 9% and 2% of total exports respectively.

Now we consider the annual exports from the last EU members to Russia. In *Figure 4a* we depict the exports distribution by sectors for the whole period. There were no high differences with the total EU exports composition: machinery 40%; chemical 17%, manufactures goods by material 17%, food and beverages 13%, other manufactured articles 11% and raw material 2%. Now we calculate two different averages, one before the sixth enlargement, from 1999 to 2003, and the other one after the sixth enlargement, from 2004 to 2009 (*Figure 4b*). Only the sector of machinery and transport equipments gained relative importance from one period to the other (it gained 14 percentage points).

Now we consider the exports from a sample of the sixth enlargement countries taking into two possible destinations, the EU15 and Russia.²² We calculate the exports composition for the periods 1999-2003 and 2004-2009 according to the export destination (*Figure 5*). In

²² We consider the Czech Republic, Hungary, Lithuania, Poland and Slovenia as exporter countries. These five countries represented the 80% of the export from the last EU members to Russia for the period 1999-2009. Moreover, the Czech Republic, Hungary and Poland had the highest nominal GDP and Slovenia had the highest nominal GDP per capita during the period.

this way we control not only for the differences in the trade composition, but also for the sectoral changes after 2004 with respect to the destination. Firstly we consider the **Czech Republic** as the exporter country (*Panel a*). Before 2004 the most important export sector was machinery for both destinations (52% in the exports to EU15 and 45% in the exports to Russia). In this country the production of automobiles, machine tools and engineering products has always been very important.²³ Chemical exports were relatively most important in the exports to Russia (15%) than in the exports to the EU15 (4%). For both destinations the only sector which gained relative importance was machinery, but the relative change was larger in the case of Russia (13 versus 6 percentage points). Secondly, we consider **Hungary** as the exporter country (*Panel b*). The country's main manufactures exports include electric and electronic equipment, machinery, foodstuffs and chemicals.²⁴ Before 2004 machinery and other manufactured articles sectors represented more than three quarters of the total exports to the EU. For the same period, Russia was the preferential destination for chemicals (34%), food and beverages (32%) and machinery (17%). In the case of Russia, machinery was the sector which gained most relative importance (33 percentage points) while food and beverages was the sector with the highest relative lost (21 percentage points). Thirdly, we consider **Lithuania** as the exporter country (*Panel c*). Before 2004 its trade structure was very different according to the destination. The most important exporting sectors were other manufactured articles (31%) and raw materials (23%) in the case of trade with the EU15 while the most important sectors were machinery (52%) and food and beverages (18%) when the trading partner was Russia. Food and beverages sector gained importance for both destinations. During the second period, machinery was still relatively more important in the exports to Russia than in the exports to the EU15 (39% versus 13%). Fourthly, we consider **Poland** as the exporter country (*Panel d*). In the case of trade versus the EU15, manufactures and machinery represented more than three quarters of the total exports. The relative importance of the raw material was not very high (8%) but it was higher than for the other exporter countries (except Lithuania). Poland is rich in natural mineral resources (iron, zinc, copper and rock salt).²⁵ In the case of exports to Russia, the export distribution was equality divided between all the sectors

²³ http://europa.eu/about-eu/member-countries/czechrepublic/index_en.htm

²⁴ http://europa.eu/about-eu/member-countries/hungary/index_en.htm

²⁵ http://europa.eu/about-eu/member-countries/poland/index_en.htm

(except the raw material that had very low relative importance). The most important change after 2004 was the increase in the relative importance of machinery (from 18% to 32%) and the decrease in the relative importance of the food and beverages (from 24% to 12%) as consequence of the Russian ban imposed to the Polish meat exports. During the second period, chemical still was more important to the export to Russia than to the exports to the EU15 (17% versus 7%). Lastly we consider **Slovenia** as the exporter country (*Panel e*). Its principal exporting industries are car complements, chemicals, electronics, electrical appliances, metal goods, textiles and furniture.²⁶ Manufactures and machinery represented 90% of the total exports to the EU15. Considering Russia as destination country, the most important sectors were chemical (48%) and machinery (33%), although the manufactures slightly gained relative importance between both periods. After 2004, chemical still was more important to the export to Russia than to the exports to the EU15 (42% versus 9%).

Finally we discuss the main descriptive statistics of our database. First we consider the annual exports from the EU to Russia for the whole period (that is from 1999 to 2009). We study separately each sector; as there are twenty five countries that export to Russia during eleven years, each sector has 275 observations.²⁷ In the upper part of the *Table 9a*, the statistics have been calculated using the total sample. The sector with the highest mean is the machinery and transport equipments with USD 1,230 millions while the sector with the lowest mean is the raw materials with only USD 47.6 millions. The average of the EU's nominal gross domestic product is USD 509 billions while the average of the Russia's nominal gross domestic product is USD 735 billions. The average distance to Russia is 1,909.2 kilometers. At the bottom of the *Table 9a* the total sample have been divided into two different subsamples, one for the EU15 group (154 observations) and the other one for the last 12 EU members (121 observations). Some descriptive values are calculated separately for each subsample. The average nominal gross domestic product is higher for the EU15 group than for the last EU members group, being USD 854 billions and USD 179 billions respectively. But the last EU members are, on average, closer to Russia than the EU15 group. Moreover, these differences are statistically significantly different from zero.

²⁶ http://europa.eu/about-eu/member-countries/slovenis/index_en.htm

²⁷ Luxemburg and Malta have been excluded because these countries have many missing values that could create problems in the results.

Table 9b reports the main statistics of the annual exports from the last EU members to the EU and Russia (1999-2009). As there are ten exporter countries and twenty-five destination countries, each sector has 2,640 observations.²⁸ The sector with the highest mean is the machinery and transport equipments with USD 501 millions while the sector with the lowest mean is the food and beverages with only USD 69.7 millions. The origin country's nominal gross domestic product is USD 76.6 billions while the destination nominal gross domestic product is USD 538 billions. The average distance is 1,182 kilometers.

6. Econometric strategy and Results

The multiplicative structure of the standard gravity equation implies that its parameters can be estimated by taking its logarithm, which (from equation (1)) gives us the following log-linear regression:

$$\ln X_{rs} = \ln G + \alpha \ln Y_r + \beta \ln Y_s - \delta \ln d_{rs} + \varepsilon_{rs}, \quad (2)$$

where $\ln G$ is the constant and ε_{rs} denotes the error term. The form of this regression is very interesting because the parameters α , β , δ can be interpreted as the elasticity of trade with respect the exporter country's GDP, the importer country's GDP and the distance between them respectively.

In this paper we use an augmented gravity model to analyze the last EU members' exports direction and composition during the period 1999-2009. In order to take into account the "multilateral resistance" terms defined in Anderson and vanWincoop (2003), country and time fixed effects are included in our specification (Feenstra, 2004; Baldwin and Taglioni, 2006). These variables allow us controlling for some country and year unobserved characteristics that may be correlated with the explanatory variables. Our general specification is defined in the following equation:

$$\ln X_{s,ijt} = \alpha_1 + \alpha_2 \ln Y_{it} + \alpha_3 \ln Y_{jt} - \alpha_4 \ln d_{ij} + \alpha_5 Z_{ij} + \alpha_6 W_{ijt} + \eta_i + \theta_t + \varepsilon_{s,ijt}, \quad (3)$$

$$s = 1, 2, 3, 4, 5; t = 1999, 2000, \dots, 2009$$

²⁸ Cyprus and Malta are excluded as exporter countries; Cyprus, Luxemburg and Malta are excluded as destination countries. We do not consider the internal trade (e.g. the trade within Poland).

where s is the sector, i is the export country, j is the importer country and t is the year. Therefore, the dependent variable, $X_{s,ijt}$, is the annual exports (in current USD) in sector s from country i to j in year t . The estimation of the dependent variable relies on a constant α_1 , the country i 's GDP in year t (Y_{it}), the country j 's GDP in year t (Y_{jt}), the distance between i and j (d_{ij}), some country dummy variables (Z_{ij}), some country-year dummy variables (W_{ijt}) and the country and year fixed effects (η_i and θ_t respectively).²⁹ From equation (3) we propose two different specifications according to the groups of countries defined as exporters and importers. First, we consider the exports from the EU to Russia and then the exports from the last EU members to EU and Russia. As exporting behavior could be affected by specific sector characteristics, we study each sector separately. We use a pooled panel model with standard errors to estimate our different specifications. The strong assumption of pooled model is that independent variables are exogenous and that the error term is uncorrelated both over time for a given individual and over individuals.

In the first specification we consider the annual exports from the EU to Russia. We use a pooled panel model with robust standard errors to estimate the following gravity equation:

$$\ln X_{s,iRUt} = \mu_1 + \mu_2 \ln Y_{it} + \mu_3 \ln Y_{RUt} - \mu_4 \ln d_{iRU} + \mu_5 Z_i + \mu_6 W_{it} + \varepsilon_{s,iRUt}, \quad (4)$$

$$s = 1, 2, 3, 4, 5; \quad i = 1, 2, \dots, 25; \quad t = 1999, 2000, \dots, 2009$$

where s is the sector, i is the export country³⁰ and t is the year. Therefore, the dependent variable, $X_{s,iRUt}$, is the annual exports (in current USD) in sector s from country i to Russia in year t . This dependent variable is explain by a constant μ_1 , the country i 's GDP in year t (Y_{it}), Russia's GDP in year t (Y_{RUt}), the distance between i and Russia (d_{iRU}), country dummy variables (Z_i) and country-year dummy variables (W_{it}).³¹ The $\varepsilon_{s,iRUt}$ are typical disturbance terms, assumed to be iid with a zero mean and constant variance σ_ε^2 . Regarding the country dummy variables (Z_i), we created the dummy variable “*contig*” that indicates if the exporter country shares frontier with Russian.³² Common border could be a factor related to preferences and trade costs if we assume that the cultural differences

²⁹ Exports, GDPs and distance are in logarithms.

³⁰ Luxemburg and Malta are excluded.

³¹ Exports, GDPs and distance are in logarithms.

³² There are only four EU members contiguous to Russian Federation: Estonia, Latvia, Lithuania and Poland.

between two contiguous countries are lower than the cultural differences between two non-contiguous countries (Redding and Venables, 2004). In addition, three of the four countries that share frontier to Russia were members of the URSS; therefore, these countries could have stronger economic ties with Russia.³³ The dummy called “*eu27_15*” indicates that the exporter country belong to the last EU enlargements.³⁴ Since we want to study the impact of the two last enlargements separately, we divide the last EU members into two different subgroups and we define two dummy, one referred to the countries belonging to the sixth enlargement (2004)³⁵ and the other one referred to the countries belonging to the seventh enlargement (2007).³⁶ Another important issue is to study the exporting behavior of these groups before and after their entrance into the EU. In order to do that, four country-time dummy variables have been created. Dependent and independent variables are defined in *Table 10a* and *Table 10b* respectively. Neither exporter nor time fixed effects are included in this specification because in this model there is only an importer country, Russia, so the Russian’s GDP are capturing the time variations.

The same methodology is used for all the sectors, first we run the standard gravity model, where the annual exports (in log) are explained by a constant, the GDPs (in log), the distances (in log) and the dummy variable that indicates if the countries share frontier with Russia.³⁷ In the second regression, the dummy “*eu27_15*” is added in order to evaluate whether countries belonging to the two last EU enlargements have additional effects on the annual exports toward Russia.³⁸ Then, we differentiate between countries belonging to the sixth enlargement and countries belonging to the seventh enlargement.³⁹ Lastly, some country-year dummy variables are included in order to assess whether the year of entrance into the EU has had some effect on the annual exports toward Russia.⁴⁰

³³ Nevertheless, the three Baltic States did not take part in any of the post-Soviet organizations.

³⁴ This group is composed by eleven countries (Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia) and according to the United Nations geographical region classification, most of the countries that are part of this group are countries situated in the Eastern Europe (See Table 6).

³⁵ Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia

³⁶ Bulgaria and Romania

³⁷ Column 1 (Tables 11-16)

³⁸ Column 2 (Tables 11-16)

³⁹ Column 3 (Tables 11-16)

⁴⁰ Column 4 (Tables 11-16)

The most relevant qualitative results issued by these equations are the following. In the **food and beverages sector** (*Table 11*) we can notice that the GDPs have a positive effect whereas the distance toward Russia has a negative effect on the annual exports toward Russia. This is exactly what the gravity model predicts (all the coefficients are statistically significant different from zero). Apart from that, being a country that share frontier to Russia has a positive effect on annual exports whereas being a country belonging to the sixth or seventh EU enlargements has no effect on annual export toward Russia. Adding the Poland-year dummies we can perceive the effect of the ban imposed by Russia on Polish meat exports in the year 2005. In fact, we can appreciate that the Polish exports toward Russia have decreased since 2006.⁴¹ In the **raw materials sector** (*Table 12*) the gravity model prediction works. Being part of the sixth EU enlargement has a negative effect on the whole period. This result could be due to the endowment effects, remember that the European countries are not so rich in natural resources as Russia, which is one of the most abundant countries in natural resource around the world.⁴² In the **chemical sector** (*Table 13*) the gravity model prediction works but countries that share frontier with Russia suffer from a reduction in export intensity toward Russia. Being a country belonging to the sixth EU enlargement has a positive effect on both periods, before 2004 and after 2004; therefore, the year of entering into the EU has not had any effect on the exporting direction of the last EU members. In the **manufactured goods sector** (*Table 14*) the Russia's GDP is only statistically significant different from zero in the first and fourth regressions. In this last regression we can also establish that being a country belonging to the sixth EU enlargement has a positive effect on export intensity. Again the year of entering into the EU has not changed the export behavior in this group of countries. In the **machinery and transport equipments sector** (*Table 15*) the gravity model prediction also works but being a country that shares frontier with Russia has a negative effect on annual exports toward Russia. Apart from that, being a country belonging to the sixth EU enlargement has a positive effect on both periods, before 2004 and after 2004. The export trend of this sector is very important because this sector has a huge relative importance (in average this sector represent 47% of total exports). Lastly, in the **other manufactured articles sector** (*Table*

⁴¹ The variable "pol04" is excluded of the regression, so the results must be interpreted in relation with this variable.

⁴² Russia is endowed with the world's largest known reserve of natural gas (BP report, 2008).

16) the gravity model prediction also works. Again being a country belonging to the sixth EU enlargement has a positive effect on both periods.

In summary, the gravity model prediction works well in all sectors except in some regressions of the manufactured goods by material. Focusing on *column 4* of each table we can discern that being a country contiguous to Russia has a positive effect on two sectors (food and beverages and raw materials) and a negative effect on two sectors (chemical and machinery). A more interesting issue is that being a country belonging to the sixth EU enlargement has no effects on the food and beverage sector, has a negative effect on the raw material sector (endowment effect) and has a positive effect on the other sectors. Nevertheless, the year of entering into the EU (2004) has not had any effect on the export direction of these countries. Therefore, after controlling for GDP and distance, the export intensity from the countries belonging to the sixth EU enlargement to Russia is larger than the exports intensity from the EU15 to Russia in four sectors (chemical, manufactured goods by material, machinery and transport equipments and other manufactured articles) for the whole period analyzed. Further analysis is needed to know if there was any trade diversion from the last EU member exports from Russia to the EU15.

Before starting to the second specification we compare the **distance coefficients** in the different sectors. We use the coefficients estimated in the *column 4* to compare the effect of distance on exports. On the one hand, the highest impact of distance appears in the machinery and transport equipments sector (an increase in distance on 1% produces a reduction of annual exports of 3.4%). According to Combes et al. (2008) trade in construction materials is much more sensitive to distance than trade in many other goods. The distance also has a big impact on the sectors of raw materials and manufactured goods by material (the coefficient is -2.8 for both sectors). On the other hand, the lowest impact of distance is in the food and beverages sector (an increase in distance on 1% produces a reduction of annual exports of 1.4%). For all the sectors, the coefficient of distance is large in absolute value terms than the coefficient estimated in other studies.⁴³ Therefore, we must

⁴³ Disdier and Head (2008) examine 1,467 distance effects estimated in 103 papers. They report a mean elasticity of 0.9, indicating that on average bilateral trade is nearly inversely proportional to distance.

be cautious in interpreting our coefficients because they could be capturing unobserved country-specific characteristics.

Now we consider the second specification, annual exports from the last EU members to the EU and Russia. We use a pooled panel model with robust standard errors to estimate the following gravity equation:

$$\ln X_{s,ijt} = \gamma_1 + \gamma_2 \ln Y_{it} + \gamma_3 \ln Y_{jt} - \gamma_4 \ln d_{ij} + \gamma_5 Z_{it} + \gamma_6 W_{ijt} + \eta_i + \theta_t + \varepsilon_{s,ijt}, \quad (5)$$

$$s = 1, 2, 3, 4, 5; i = 1, 2, \dots, 10; j = 1, \dots, 24; t = 1999, 2000, \dots, 2009$$

where s is the sector, i is the export country⁴⁴, j is the importer country⁴⁵ and t is the year. Therefore, the dependent variable, $X_{s,ijt}$, is the annual export (in current USD) in sector s from country i to j in year t . This dependent variable is explain by a constant γ_1 , the country i 's GDP in year t (Y_{it}), the country j 's GDP in year t (Y_{jt}), the distance between i and j (d_{ij}), country dummy variables (Z_i), country-year dummy variables (W_{it}) and exporter and year specific fixed effects (η_i and θ_t respectively).⁴⁶ The $\varepsilon_{s,iRUt}$ are typical disturbance terms, assumed to be iid with a zero mean and constant variance σ_ε^2 . Regarding the country dummy variables (Z_i), we include the dummy variable “*contig*” that marks if the exporter and the importer countries share frontier. We can divide the importer countries into three groups: the EU15, Russia and the last EU members.⁴⁷ In this way we can determine whether the destination countries have effects on the last EU members' exports. We also include the dummy “*ru_g10bef04*” to control for the export from the countries belonging to the sixth enlargement to Russia before 2004. In this way we can differentiate between the effect of Russia during the whole period and the effect of Russia before 2004, that is, before the sixth enlargement. Dependent and independent variables are defined in Table 10a and Table 10b respectively.

In *Table 17* we report the results for the six sectors. Manufactured goods by material and machinery and transport equipments regressions have the highest R-square (.8145 and

⁴⁴ Cyprus and Malta are excluded.

⁴⁵ Cyprus, Luxemburg and Malta are excluded.

⁴⁶ Exports, GDPs and distance are in logarithms.

⁴⁷ We add the dummies “EU27_15” and “RU” and exclude the variables “EU15” as control group.

.8422 respectively). The gravity model works well for all sectors except for two sectors: food and beverages and raw material (in these sectors the exporter's GDP also has a positive effect but the coefficients are not statistically different from zero). As we expected, sharing frontier has a positive and statistically significant effect for all sectors. The coefficient of the dummy "RU" is positive and statistically significant for food and beverages, chemical and machinery.⁴⁸ This means that the last EU members' exports are more intense to Russia rather than to the EU15, that is, Russia is a preferential destination for these sectors. Nevertheless, Russia is not a preferential destination in the raw material sector (the coefficient of "RU" is negative and statistically significant); that result could be due to the "endowment effect." Russia also has a negative effect on the manufacturing sector (but in the case of other manufactured articles the coefficient is not statistically significant). A more interesting issue is the variable "ru_g10bef04," which captures the exports behavior of a group of countries before to the accession of these countries into the EU.⁴⁹ Comparing this coefficient with the coefficient of the variable "RU" we can establish whether there has been any change in the exports from the last EU members to Russia after 2004. In **column (a)**, food and beverages, both coefficients are very similar and statistically significant. In **column (b)**, raw material, the coefficient of the variable "ru_g10bef04" is lower in absolute value than the coefficient of "RU" (but it is not statistically significant). In **column (c)**, chemical, the coefficient of the variable "ru_g10bef04" is lower than the coefficient of "RU" (and it is statistically significant). In **columns (d) and (f)**, manufactured goods by material and other manufactured articles respectively, the coefficient of the variable "ru_g10bef04" is positive and statistically significant. In **column (e)**, machinery, the coefficient of the variable "ru_g10bef04" is lower than the coefficient of "RU" (but it is not statistically significant). Therefore, we detect three different effects on the exports from the last EU members to Russia after 2004. First, there were not effects on food and beverages; second, there was larger trade in chemical and machinery; third, there was a trade diversion in raw material and manufactures.⁵⁰ Another interesting outcome is that the

⁴⁸ Remember that the variable "RU" is a dummy equal to one when Russia is the destination country and zero otherwise.

⁴⁹ Remember that the variable "ru_g10bef04" is a dummy equal to one when the exporter belongs to the sixth enlargement, the importer country is Russia and the year is before 2004.

⁵⁰ We can reject the null hypothesis that the difference between the variables "RU" and "ru_g10bef04" is zero in all sectors except for the food and beverages sector.

machinery sector has the highest exporter country's GDP coefficient (1.5) and, as we have noticed previously, Russia is a preferential destination in this sector. One reason that could justify this result is that the last EU members prefer export to Russia the item belonging to this sector because their products are more competitive in the Russian market than in the EU market.⁵¹ Finally we discuss the **distance effects**. The distance coefficients ("*Indist*") in *Table 17* are lower than the distance coefficients obtained in the first specification.⁵² It is because now we use more destination countries and we control for countries unobserved characteristics. These coefficients, however, are still higher than in other studies.⁵³ Now the highest impact of distance to trade appears in raw material sector (-2.25), but it may be due to the "endowment effect" (the last EU members are not rich in natural resources).

7. Conclusions

The last two EU enlargements affected in various ways the overall picture of the EU, above all the economic field. This paper examines the impact on the direction and the composition of export flows between the EU, above all the last EU members, and Russia from 1999 to 2009. Using panel data at country level we estimate an augmented gravity equation for each sector. After the sixth EU enlargement (2004), it is not so clear that the last EU members diverted their principal trade destination from Russia to the EU15 members. Some interesting sectoral effects appear. On the one hand, Russia is preferential destination for food and beverages, chemical and machinery. On the other hand, we detect an export diversion from Russia to the EU15 in the other three sectors: raw material, manufactured goods by material and other manufactured articles. Nevertheless these sectors were not very important in relative terms. Taking into account the whole period, these sectors represented approximately 30% of the total exports from the last EU members to Russia.

In order to provide further insights about these issues there will be different possible extensions. Firstly, a robust analysis is needed to confirm the results obtained in this paper. Secondly, the econometric strategy must be improved because we need to control for any

⁵¹ The economic integration of the ex-CEECs could have produced an increase in their productivities. It is the dynamic effect defined by Jacob Viner.

⁵² Column 4 (Tables 11-16)

⁵³ Remember that Disdier and Head (2008) report a mean elasticity of 0.9.

possible correlation of the error term over time (*within* correlation) and over countries (*between* correlation). Thirdly, working with data at firm level would allow us to take into account the individual behavior. This kind of information would be extremely useful to develop more policy oriented studies to take into consideration the implementation of public policies more suitable for achieving a deeper economic integration among EU member states.

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ANNEX

Table 1

Leading partner countries of the EU in merchandise trade (2006-2009)

| Extra EU partners | TOTAL EXTERNAL TRADE (exports + imports) | | | | | | | |
|--------------------|--|-------|-------|-------|-------|-------|-------|-------|
| | 2006 | | 2007 | | 2008 | | 2009 | |
| | Rank | % | Rank | % | Rank | % | Rank | % |
| USA | 1 | 17.76 | 1 | 16.54 | 1 | 15.20 | 1 | 15.84 |
| China | 2 | 10.3 | 2 | 11.39 | 2 | 11.35 | 2 | 12.88 |
| Russia | 3 | 8.49 | 3 | 8.74 | 3 | 9.84 | 3 | 7.94 |
| Switzerland | 4 | 6.84 | 4 | 6.35 | 4 | 6.20 | 4 | 7.05 |
| Norway | 6 | 4.68 | 6 | 4.50 | 5 | 4.86 | 5 | 4.62 |
| Japan | 5 | 4.87 | 5 | 4.57 | 6 | 4.08 | 6 | 4.03 |
| Other | 47.63 | | 47.92 | | 48.47 | | 47.63 | |
| Total | 100 | | 100 | | 100 | | 100 | |

Source: Eurostat

Table 2

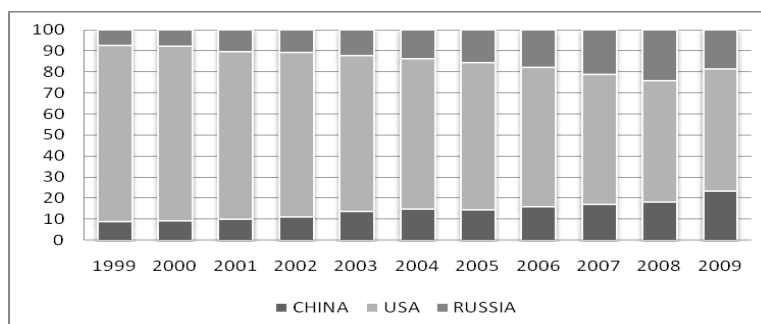
EU external trade distribution by the main partners (1999, 2004 and 2009)

| Extra EU partners | EXPORTS | | | IMPORTS | | |
|-------------------|---------|-------|-------|---------|-------|-------|
| | 1999 | 2004 | 2009 | 1999 | 2004 | 2009 |
| USA | 83.66 | 71.39 | 58.13 | 65.21 | 42.84 | 32.55 |
| China | 8.80 | 14.66 | 23.31 | 20.68 | 34.59 | 43.79 |
| Russia | 7.54 | 13.95 | 18.56 | 14.11 | 22.57 | 23.66 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 |

Source: Eurostat

Figure 1a

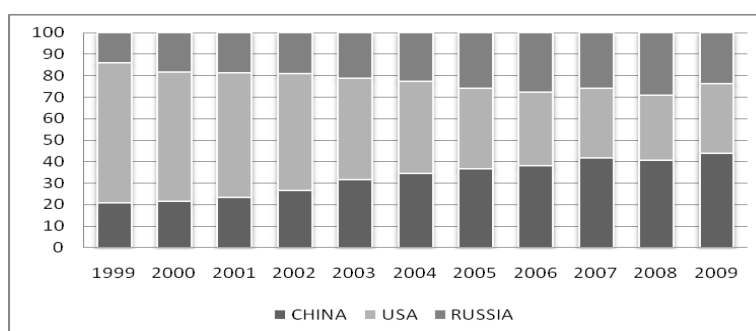
EU exports distribution by the main partners (1999-2009)



Source: Eurostat

Figure 1b

EU imports distribution by the main partners (1999-2009)



Source: Eurostat

Table 3a

EU exports distribution by EU subgroups (1999, 2004 and 2009)

| EU subgroups | Exports to USA | | | Exports to China | | | Exports to Russia | | |
|----------------|----------------|-------|-------|------------------|-------|-------|-------------------|-------|-------|
| | 1999 | 2004 | 2009 | 1999 | 2004 | 2009 | 1999 | 2004 | 2009 |
| EU15 | 97.87 | 96.88 | 96.85 | 98.43 | 97.23 | 95.61 | 87.32 | 87.07 | 79.58 |
| EU27_15 | 2.13 | 3.12 | 3.15 | 1.57 | 2.77 | 4.39 | 12.68 | 12.93 | 20.42 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Source: Eurostat

Table 3b

EU imports distribution by EU subgroups (1999, 2004 and 2009)

| EU subgroups | Imports to USA | | | Imports to China | | | Imports to Russia | | |
|----------------|----------------|-------|-------|------------------|-------|-------|-------------------|-------|-------|
| | 1999 | 2004 | 2009 | 1999 | 2004 | 2009 | 1999 | 2004 | 2009 |
| EU15 | 96.82 | 96.66 | 96.89 | 94.41 | 91.90 | 90.61 | 71.35 | 76.93 | 74.38 |
| EU27_15 | 3.18 | 3.334 | 3.11 | 5.59 | 8.10 | 9.39 | 27.65 | 23.07 | 25.62 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Source: Eurostat

Table 4

Last EU members exports distribution between the EU15 and Russia (1999, 2004 and 2009)

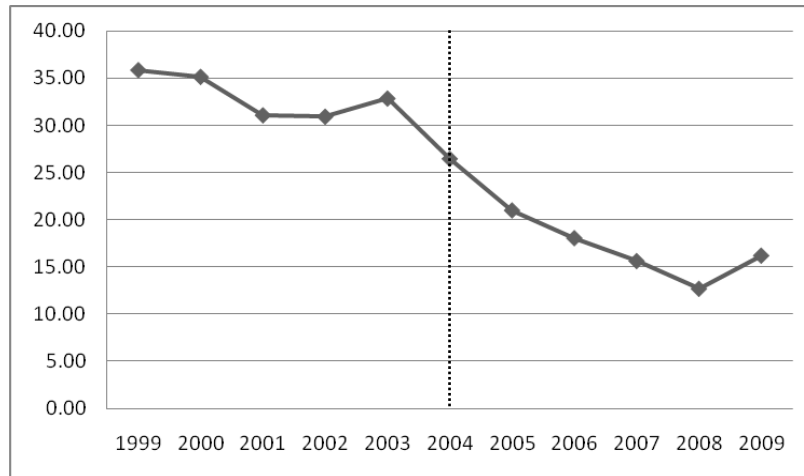
| | Last 12 EU members' exports distribution | | |
|---------------|--|-------|-------|
| | 1999 | 2004 | 2009 |
| EU15 | 97.28 | 96.36 | 94.14 |
| Russia | 2.72 | 3.64 | 5.81 |
| Total | 100 | 100 | 100 |

Source: Eurostat

Figure 2

**Last EU members' exports distribution between the EU15 and Russia (1999-2009)
Relative importance of the EU15 over Russia**

$$\frac{X_{eu27_15, EU15}}{X_{eu27_15, RU}}$$



Source: Eurostat

Table 5

Russian external trade distribution by countries (1998, 2004 and 2009)

| Partners / Years | 1998 | | 2004 | | 2009 | |
|------------------------|---------|---------|---------|---------|---------|---------|
| | EXPORTS | IMPORTS | EXPORTS | IMPORTS | EXPORTS | IMPORTS |
| EU27 | 47.75 | 47.03 | 60 | 49.81 | 53.40 | 44.57 |
| CIS | 18.75 | 24.76 | 16.18 | 23.46 | 15.58 | 12.89 |
| China | 4.36 | 2.55 | 5.57 | 6.28 | 5.56 | 13.24 |
| USA | 7.41 | 9.12 | 3.63 | 4.23 | 3.09 | 5.48 |
| Other countries | 21.73 | 16.54 | 14.62 | 16.22 | 22.37 | 23.82 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 |

Source: www.rusimpex.ru

Table 6

European Union members

| Country | ISO 2-alpha | ISO 3-alpha | Year EU enter | EU subgroup* | Geographical region** |
|-----------------------|-------------|-------------|---------------|--------------|-----------------------|
| Austria | AT | AUT | 1995 | EU15 | Western Europe |
| Belgium | BE | BEL | 1957 | EU15 | Western Europe |
| Bulgaria | BG | BGR | 2007 | EU27_15 | Eastern Europe |
| Cyprus | CY | CYP | 2004 | EU27_15 | Western Asia |
| Czech Republic | CZ | CZE | 2004 | EU27_15 | Eastern Europe |
| Denmark | DK | DNK | 1973 | EU15 | Northern Europe |
| Estonia | EE | EST | 2004 | EU27_15 | Northern Europe |
| Finland | FI | FIN | 1995 | EU15 | Northern Europe |
| France | FR | FRA | 1957 | EU15 | Western Europe |
| Germany | DE | DEU | 1957 | EU15 | Western Europe |
| Greece | GR | GRC | 1981 | EU15 | Southern Europe |
| Hungary | HU | HUN | 2004 | EU27_15 | Eastern Europe |
| Ireland | IE | IRL | 1973 | EU15 | Northern Europe |
| Italy | IT | ITA | 1957 | EU15 | Southern Europe |
| Latvia | LV | LVA | 2004 | EU27_15 | Northern Europe |
| Lithuania | LT | LTU | 2004 | EU27_15 | Northern Europe |
| Luxemburg | LU | LUX | 1957 | EU15 | Western Europe |
| Malta | MT | MLT | 2004 | EU27_15 | Southern Europe |
| Netherland | NL | NLD | 1957 | EU15 | Western Europe |
| Poland | PL | POL | 2004 | EU27_15 | Eastern Europe |
| Portugal | PT | PRT | 1986 | EU15 | Southern Europe |
| Romania | RO | ROM | 2007 | EU27_15 | Eastern Europe |
| Slovakia | SK | SVK | 2004 | EU27_15 | Eastern Europe |
| Slovenia | SI | SVN | 2004 | EU27_15 | Southern Europe |
| Spain | ES | ESP | 1986 | EU15 | Southern Europe |
| Sweden | SE | SWE | 1995 | EU15 | Northern Europe |
| United Kingdom | GB | GBR | 1973 | EU15 | Northern Europe |

(*) *EU15* is formed by the first 15 EU members whereas *EU27_15* is formed by the last 12 EU members

(**) According to the United Nations

Table 7

Sectors according to SITC sections (Revision 4)

| SECTOR | SITC Sections |
|---|---------------|
| Food and beverages | 0 and 1 |
| Raw materials | 2 and 3 |
| Chemicals | 4 and 5 |
| Manufactures goods by materials | 6 |
| Machinery and transport equipments | 7 |
| Other manufactures articles | 8 |

Table 8

EU exports distribution by sectors (1999, 2004 and 2009)

| Sector/Year | 1999 | 2004 | 2009 |
|--------------------------|------------|------------|------------|
| Food and beverages | 17.87 | 8.92 | 9.49 |
| Raw materials | 2.13 | 1.78 | 2.22 |
| Chemicals | 15.02 | 14.77 | 18.21 |
| Manuf. Goods by material | 14.21 | 13.24 | 11.82 |
| Machinery | 35.88 | 47.47 | 44.47 |
| Other manuf. articles | 14.90 | 13.82 | 13.79 |
| Total | 100 | 100 | 100 |

Source: Eurostat

Figure 3

**Exports distribution by sectors
Exports from the EU to Russia (1999-2009)**

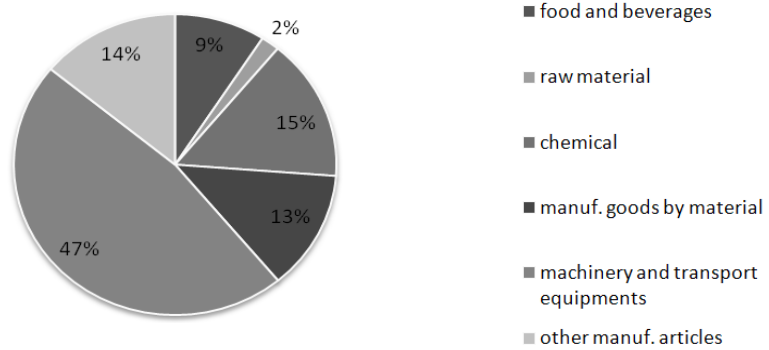


Figure 4a

**Exports distribution by sectors
Exports from the last EU members to Russia (1999-2009)**

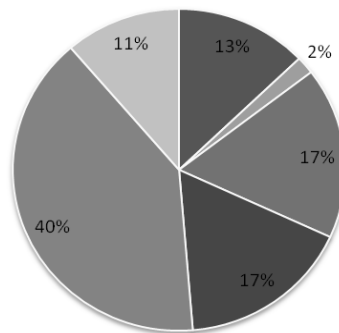


Figure 4b

**Exports distribution by sectors
Exports from the last EU countries to Russia**

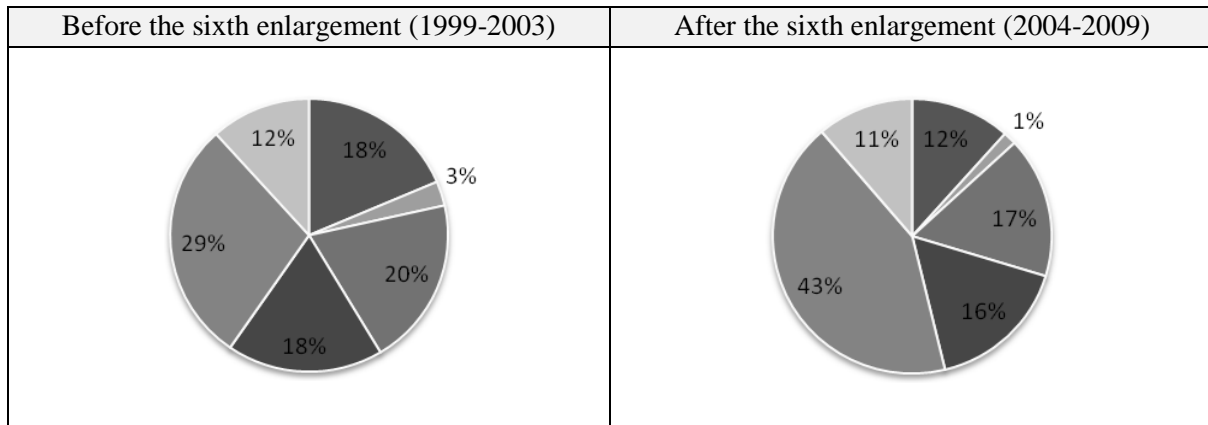
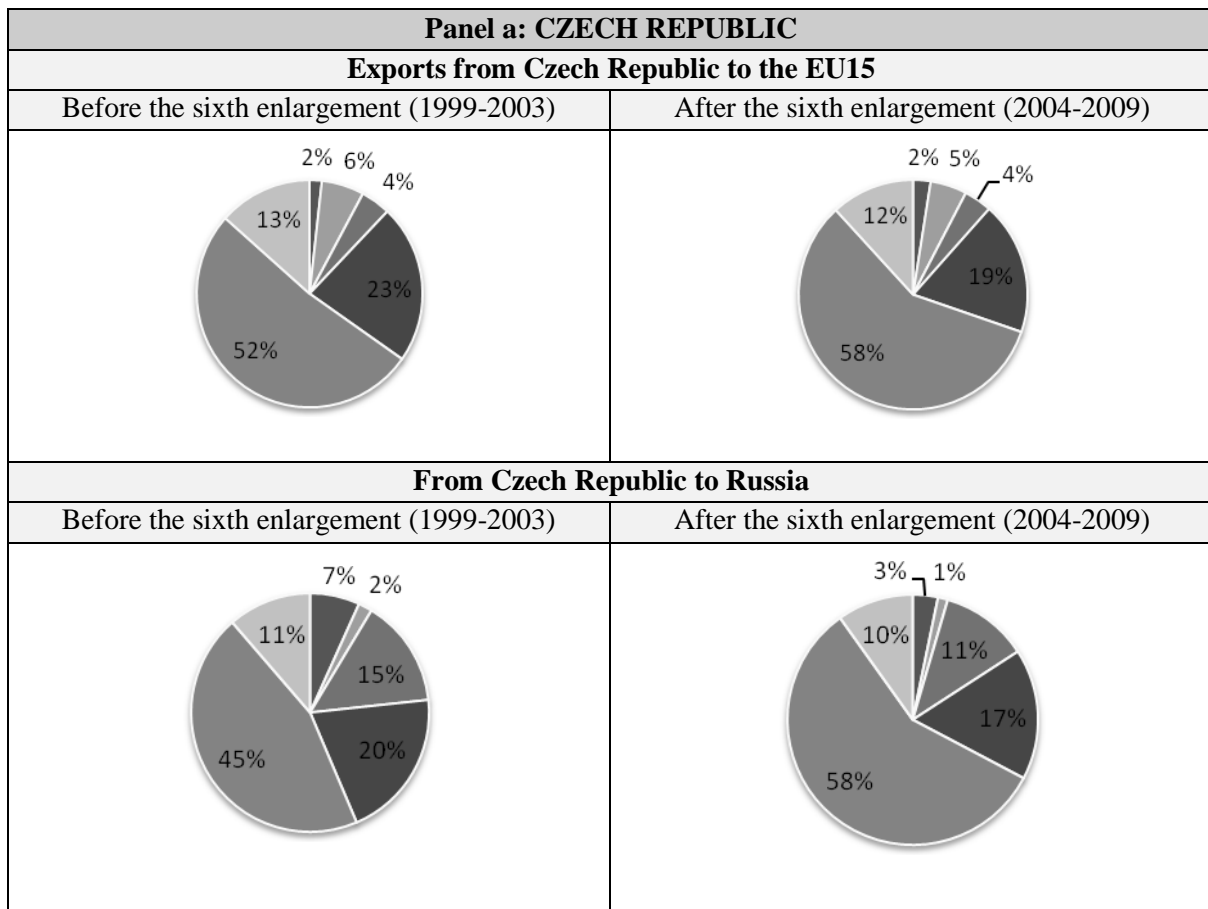


Figure 5

Exports distribution by sectors



| Panel b: HUNGARY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|-----------|---------|-----|---------|-----|-------|-----|--------|-----|--------|-----|-------|----|---|---------|-----------|---------|-----|---------|-----|-------|-----|-------|-----|--------|-----|-------|----|-------|-----|
| Exports from Hungary to the EU15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Before the sixth enlargement (1999-2003) | After the sixth enlargement (2004-2009) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <caption>Exports from Hungary to the EU15 (Before 2004)</caption> <tr><th>Country</th><th>Share (%)</th></tr> <tr><td>Germany</td><td>66%</td></tr> <tr><td>France</td><td>13%</td></tr> <tr><td>Italy</td><td>9%</td></tr> <tr><td>Spain</td><td>4%</td></tr> <tr><td>Poland</td><td>3%</td></tr> <tr><td>Other</td><td>5%</td></tr> </table> | Country | Share (%) | Germany | 66% | France | 13% | Italy | 9% | Spain | 4% | Poland | 3% | Other | 5% | <table border="1"> <caption>Exports from Hungary to the EU15 (After 2004)</caption> <tr><th>Country</th><th>Share (%)</th></tr> <tr><td>Germany</td><td>67%</td></tr> <tr><td>France</td><td>10%</td></tr> <tr><td>Italy</td><td>9%</td></tr> <tr><td>Spain</td><td>5%</td></tr> <tr><td>Poland</td><td>4%</td></tr> <tr><td>Other</td><td>5%</td></tr> </table> | Country | Share (%) | Germany | 67% | France | 10% | Italy | 9% | Spain | 5% | Poland | 4% | Other | 5% | | |
| Country | Share (%) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Germany | 66% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| France | 13% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Italy | 9% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Spain | 4% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Poland | 3% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other | 5% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Country | Share (%) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Germany | 67% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| France | 10% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Italy | 9% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Spain | 5% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Poland | 4% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other | 5% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Exports from Hungary to Russia | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Before the sixth enlargement (1999-2003) | After the sixth enlargement (2004-2009) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <caption>Exports from Hungary to Russia (Before 2004)</caption> <tr><th>Country</th><th>Share (%)</th></tr> <tr><td>Belarus</td><td>34%</td></tr> <tr><td>Ukraine</td><td>32%</td></tr> <tr><td>Other</td><td>17%</td></tr> <tr><td>Poland</td><td>8%</td></tr> <tr><td>Other</td><td>8%</td></tr> <tr><td>Other</td><td>1%</td></tr> </table> | Country | Share (%) | Belarus | 34% | Ukraine | 32% | Other | 17% | Poland | 8% | Other | 8% | Other | 1% | <table border="1"> <caption>Exports from Hungary to Russia (After 2004)</caption> <tr><th>Country</th><th>Share (%)</th></tr> <tr><td>Belarus</td><td>50%</td></tr> <tr><td>Ukraine</td><td>26%</td></tr> <tr><td>Other</td><td>11%</td></tr> <tr><td>Other</td><td>8%</td></tr> <tr><td>Other</td><td>4%</td></tr> <tr><td>Other</td><td>1%</td></tr> </table> | Country | Share (%) | Belarus | 50% | Ukraine | 26% | Other | 11% | Other | 8% | Other | 4% | Other | 1% | | |
| Country | Share (%) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Belarus | 34% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ukraine | 32% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other | 17% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Poland | 8% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other | 8% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other | 1% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Country | Share (%) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Belarus | 50% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ukraine | 26% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other | 11% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other | 8% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other | 4% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other | 1% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Panel c: LITHUANIA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Exports from Lithuania to the EU15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Before the sixth enlargement (1999-2003) | After the sixth enlargement (2004-2009) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <caption>Exports from Lithuania to the EU15 (Before 2004)</caption> <tr><th>Country</th><th>Share (%)</th></tr> <tr><td>Germany</td><td>31%</td></tr> <tr><td>France</td><td>23%</td></tr> <tr><td>Italy</td><td>16%</td></tr> <tr><td>Spain</td><td>11%</td></tr> <tr><td>Poland</td><td>11%</td></tr> <tr><td>Other</td><td>8%</td></tr> </table> | Country | Share (%) | Germany | 31% | France | 23% | Italy | 16% | Spain | 11% | Poland | 11% | Other | 8% | <table border="1"> <caption>Exports from Lithuania to the EU15 (After 2004)</caption> <tr><th>Country</th><th>Share (%)</th></tr> <tr><td>Germany</td><td>29%</td></tr> <tr><td>France</td><td>21%</td></tr> <tr><td>Italy</td><td>14%</td></tr> <tr><td>Spain</td><td>14%</td></tr> <tr><td>Poland</td><td>13%</td></tr> <tr><td>Other</td><td>9%</td></tr> <tr><td>Other</td><td>14%</td></tr> </table> | Country | Share (%) | Germany | 29% | France | 21% | Italy | 14% | Spain | 14% | Poland | 13% | Other | 9% | Other | 14% |
| Country | Share (%) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Germany | 31% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| France | 23% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Italy | 16% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Spain | 11% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Poland | 11% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other | 8% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Country | Share (%) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Germany | 29% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| France | 21% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Italy | 14% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Spain | 14% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Poland | 13% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other | 9% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other | 14% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Exports from Lithuania to Russia | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Before the sixth enlargement (1999-2003) | After the sixth enlargement (2004-2009) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <caption>Exports from Lithuania to Russia (Before 2004)</caption> <tr><th>Country</th><th>Share (%)</th></tr> <tr><td>Belarus</td><td>52%</td></tr> <tr><td>Ukraine</td><td>18%</td></tr> <tr><td>Other</td><td>11%</td></tr> <tr><td>Other</td><td>7%</td></tr> <tr><td>Other</td><td>6%</td></tr> <tr><td>Other</td><td>6%</td></tr> </table> | Country | Share (%) | Belarus | 52% | Ukraine | 18% | Other | 11% | Other | 7% | Other | 6% | Other | 6% | <table border="1"> <caption>Exports from Lithuania to Russia (After 2004)</caption> <tr><th>Country</th><th>Share (%)</th></tr> <tr><td>Belarus</td><td>39%</td></tr> <tr><td>Ukraine</td><td>26%</td></tr> <tr><td>Other</td><td>13%</td></tr> <tr><td>Other</td><td>12%</td></tr> <tr><td>Other</td><td>7%</td></tr> <tr><td>Other</td><td>3%</td></tr> </table> | Country | Share (%) | Belarus | 39% | Ukraine | 26% | Other | 13% | Other | 12% | Other | 7% | Other | 3% | | |
| Country | Share (%) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Belarus | 52% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ukraine | 18% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other | 11% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other | 7% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other | 6% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other | 6% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Country | Share (%) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Belarus | 39% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ukraine | 26% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other | 13% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other | 12% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other | 7% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other | 3% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Panel d: POLAND | |
|--|---|
| Exports from Poland to the EU15 | |
| Before the sixth enlargement (1999-2003) | After the sixth enlargement (2004-2009) |
| | |
| Exports from Poland to Russia | |
| Before the sixth enlargement (1999-2003) | After the sixth enlargement (2004-2009) |
| | |
| Panel e: SLOVENIA | |
| Exports from Slovenia to the EU15 | |
| Before the sixth enlargement (1999-2003) | After the sixth enlargement (2004-2009) |
| | |
| Exports from Slovenia to Russia | |
| Before the sixth enlargement (1999-2003) | After the sixth enlargement (2004-2009) |
| | |

Table 9a

Descriptive statistics: Annual exports from the EU to Russia[#]

| | Mean | Std. Dev. (overall) | Std. Dev. (between) | Std. Dev. (within) |
|---|--------------|---------------------|---------------------|--------------------|
| Food and beverages ^a | 231 | 303 | 257 | 168 |
| Raw material ^a | 47.6 | 91.7 | 73.5 | 56.7 |
| Chemical ^a | 395 | 729 | 594 | 438 |
| Manuf. by material ^a | 328 | 608 | 503 | 355 |
| Machinery ^a | 1,230 | 2,810 | 2,270 | 1,700 |
| Other manuf. articles ^a | 360 | 782 | 653 | 448 |
| Nominal GDP (EU) ^b | 509 | 770 | 751 | 224 |
| Nominal GDP (RUS) ^b | 735 | 474 | 0 | 474 |
| Distance ^c | 1909.2 | 768.1 | 782.5 | 0 |
| Number observations | N=275 | | n=25 | T=11 |
| Subsamples | Mean | Std. Dev. (overall) | Difference | |
| | | | Mean | Std. Err. |
| Nominal GDP (EU15) ^b | 854 | 886 | 783*** | 80.9 |
| Nominal GDP (EU27_15) ^b | 71 | 91.3 | | |
| Distance (EU15) ^c | 2,259.7 | 775.9 | 796.5*** | 80.1 |
| Distance (EU27_15) ^c | 1,463.1 | 470.5 | | |
| [#] LUX and MLT are excluded ^a USD millions / ^b USD billions / ^c Kilometers (***) Statistically significant at the 0.01 level | | | | |

Table 9b

Descriptive statistics: Annual exports from the last EU members to the EU and Russia^{##}

| | Mean | Std. Dev. (overall) |
|---|----------------|---------------------|
| Food and beverages ^a | 69.7 | 193 |
| Raw material ^a | 81.6 | 215 |
| Chemical ^a | 74.1 | 171 |
| Manuf. by material ^a | 214 | 613 |
| Machinery ^a | 501 | 1,560 |
| Other manuf. articles ^a | 162 | 467 |
| Origin nominal GDP ^b | 76.6 | 93.6 |
| Destination nominal GDP ^b | 538 | 769 |
| Destination nominal GDP ^{bd} | 846 | 862 |
| Distance ^c | 1,182.7 | 657.1 |
| Number observations | N=2,640 | |
| ^{##} CYP, LUX and MLT are excluded ^a USD millions / ^b USD billions / ^c Kilometers / ^d Without EU27_15 | | |

Table 10a

Dependent variables

| Variable | Definition |
|--------------------|--|
| xfood | Annual exports (current U.S. dollars) in food and beverages |
| xrawmat | Annual exports (current U.S. dollars) in raw material |
| xchemical | Annual exports (current U.S. dollars) in chemical |
| xmanufbymat | Annual exports (current U.S. dollars) in manufactured goods by material |
| xmachinery | Annual exports (current U.S. dollars) in machinery and transport equipment |
| xothermanuf | Annual exports (current U.S. dollars) in other manufactured articles |

Table 10b

Control variables

| Variable | Definition |
|---|---|
| Common explanatory variables (for both specifications) | |
| dist | Distance (kms) between countries |
| contig | Dummy variable that takes value one if the exporter and the importer share common border ⁵⁴ |
| Explanatory variables to the first specification | |
| ngdpd | Exporter's country nominal gross domestic product (U.S. dollars) |
| rungdpd | Russia's nominal gross domestic product (U.S. dollars) |
| eu27_15 | Dummy variable that takes value one if the exporter country has been incorporated to the EU in the two last enlargements (2004 and 2007), and zero otherwise |
| group10_04 | Dummy variable that takes value one if the exporter country has been incorporated to the EU in the sixth enlargement (2004), and zero otherwise |
| group2_07 | Dummy variable that takes value one if the exporter country has been incorporated to the EU in the last enlargement (2007), and zero otherwise |
| group10_before04 | Dummy variable that takes value one if exporter country belongs to the penultimate EU enlargement and year is before 2004 (1999-2003), and zero otherwise |
| group10_after04 | Dummy variable that takes value one if exporter country belongs to the penultimate EU enlargement and year is after 2004 (2004-2009), and zero otherwise |
| group2_before07 | Dummy variable that takes value one if exporter country belongs to the last EU enlargement and year is before 2007 (1999-2006), and zero otherwise |
| group2_after07 | Dummy variable that takes value one if exporter country belongs to the last EU enlargement and year is after 2007 (2007-2009), and zero otherwise |
| pol | Dummy variables that takes value one if the exporter country is Poland and zero otherwise |
| Explanatory variables to the second specification | |
| o_ngdpd | Exporter's nominal gross domestic product (U.S. dollars) |
| d_ndgdp | Importer's nominal gross domestic product (U.S. dollars) |
| EU27_15 | Dummy variable that takes value one if the importer country has been incorporated to the EU in the two last enlargements (2004 and 2007), and zero otherwise |
| RU | Dummy variables that takes value one if the importer country is Russia and zero otherwise |
| ru_g10bef04 | Dummy variable that takes value one if exporter country belongs to the sixth enlargement group, importer country is Russia and year is before 2004, and zero otherwise. |

⁵⁴ According to the CEPII's database Bulgaria shares border with Greece and Romania, the Czech Republic shares border with Austria, Germany, Poland and Slovakia; Hungary shares border with Austria, Romania, Slovakia and Slovenia; Estonia shares border with Latvia and Russia, Lithuania shares border with Estonia, Poland and Russia; Poland shares border with the Czech Republic, Germany, Lithuania, Russia and Slovakia; Romania shares border with Bulgaria and Hungary; Slovakia shares border with Austria, the Czech Republic, Hungary and Poland and Slovenia shares border with Austria, Hungary and Italy.

Table 11

| Pooled OLS with robust standard errors | | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Dependent variable: Annual exports from the EU to Russia in food and beverages (in log) | | | | | |
| Variables/Regressions | (1) | (2) | (3) | (4) | (5) |
| lngdpd ^a | .9166*** (.0391) | .8394*** (.0714) | .8394*** (.0705) | .8391*** (.0711) | .8357*** (.0709) |
| lnrugdpd ^a | .3543*** (.0902) | .3945*** (.0887) | .3945*** (.0880) | .3726*** (.1061) | .3821*** (.1085) |
| Indist ^a | -1.3486*** (.2166) | -1.3480*** (.2510) | -1.3900*** (.2490) | -1.3899*** (.2505) | -1.3921*** (.2551) |
| contig | 1.2025*** (.2476) | 1.4413*** (.2468) | 1.2308*** (.2296) | 1.2305*** (.2280) | 1.2180*** (.2286) |
| eu27_15 | | -.4292 (.2629) | | | |
| group10_04 | | | -.2576 (.2354) | | |
| group2_07 | | | -.8853** (.4444) | | |
| group10_before04 | | | | -.3409 (.2974) | -.3642 (.3085) |
| group10_after04 | | | | -.1896 (.2272) | -.1860 (.2270) |
| group2_before07 | | | | -.7961 (.5108) | -.8029 (.5180) |
| group2_after07 | | | | -1.1257 (.8050) | -1.1404 (.8173) |
| pol | | -0.4159** (.2112) | -.4023* (.2106) | -.4015* (.2123) | |
| pol99 | | | | | .0604 |
| pol00 | | | | | -.1894 |
| pol01 | | | | | -.4167* |
| pol02 | | | | | -.2369 |
| pol03 | | | | | -.1462 |
| pol05 | | | | | -.2775 |
| pol06 | | | | | -.5909*** |
| pol07 | | | | | -.7415*** |
| pol08 | | | | | -.9153*** |
| pol09 | | | | | -.5284** |
| constant | -5.1116* (2.6967) | -4.0454 (.2112) | -3.7238 (2.6988) | -3.1233 (3.1021) | -3.2455 (3.1817) |
| Number observations | 275 | 275 | 275 | 275 | 275 |
| R-squared | .6480 | .6573 | .6649 | .6661 | .6670 |
| Robust standards errors in parenthesis | | | | | |
| Statistically significant at the 0.01 level (***), at the 0.05 level (**) or at the 0.10 level (*) | | | | | |
| In regression (5) "pol04" is the control variable | | | | | |
| ^a logarithm | | | | | |

Table 12

| Pooled OLS with robust standard errors | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| Dependent variable: Annual exports from the EU to Russia in raw materials (in log) | | | | |
| Variables/Regressions | (1) | (2) | (3) | (4) |
| lngdpd ^a | .9891*** (.0593) | .8110*** (.0671) | .8089*** (.0662) | .8085*** (.0653) |
| lnrugdpd ^a | .2499** (.1048) | .3427*** (.1049) | .3438*** (.1007) | .2737** (.1185) |
| Indist ^a | -2.8758*** (.2333) | -2.9098*** (.2406) | -2.8368*** (.2339) | -2.8365*** (.2348) |
| contig | .0954 (.2421) | .2639 (.2329) | .6286** (.2456) | .6287*** (.2417) |
| eu27_15 | | -.8185*** (.2172) | | |
| group10_04 | | | -1.1272*** (.2347) | |
| group2_07 | | | -.0171 (.3363) | |
| group10_before04 | | | | -1.4001*** (.2823) |
| group10_after04 | | | | -.9014*** (.2484) |
| group2_before07 | | | | .2942 (.3151) |
| group2_after07 | | | | -.8505 (.5699) |
| pol | | | | |
| constant | 5.5745* (3.0703) | 8.2472*** (3.0967) | 7.7149*** (2.9851) | 9.6235** (3.4164) |
| Number observations | 275 | 275 | 275 | 275 |
| R-squared | .6297 | .6458 | .6652 | .6764 |
| Robust standards errors in parenthesis Statistically significant at the 0.01 level (***), at the 0.05 level (**) or at the 0.10 level (*) ^a logarithm | | | | |

Table 13

| Pooled OLS with robust standard errors | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| Dependent variable: Annual exports from the EU to Russia in chemicals (in log) | | | | |
| Variables/Regressions | (1) | (2) | (3) | (4) |
| lngdpd ^a | .8628*** (.0441) | 1.0539*** (.0478) | 1.0562*** (.0464) | 1.0549*** (.0465) |
| lnrugdpd ^a | .5957*** (.0897) | .4962*** (.0874) | .4950*** (.0854) | .4732*** (.1008) |
| Indist ^a | -2.1681*** (.2215) | -2.1316*** (.1932) | -2.2097*** (.1848) | -2.2089*** (.1857) |
| contig | -.5085*** (.1875) | -.6893*** .2047 | -1.0793*** (.1774) | -1.0792*** (.1775) |
| eu27_15 | | .8780*** (.2063) | | |
| group10_04 | | | 1.2080*** (.1761) | |
| group2_07 | | | .0210 (.3530) | |
| group10_before04 | | | | 1.1452*** (.2130) |
| group10_after04 | | | | 1.2551*** (.1934) |
| group2_before07 | | | | .0389 (.4272) |
| group2_after07 | | | | -.0371 (.5453) |
| pol | | | | |
| constant | -3.5206 (2.9622) | -6.3874** (2.7001) | -5.8182** (2.6309) | -5.2016* (3.0497) |
| Number observations | 275 | 275 | 275 | 275 |
| R-squared | .6780 | .7008 | .7280 | .7283 |
| Robust standards errors in parenthesis Statistically significant at the 0.01 level (***), at the 0.05 level (**) or at the 0.10 level (*) ^a logarithm | | | | |

Table 14

| Pooled OLS with robust standard errors | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| Dependent variable: Annual exports from the EU to Russia in manufactured good by materials (in log) | | | | |
| Variables/Regressions | (1) | (2) | (3) | (4) |
| lngdpd ^a | 1.1247*** (.0668) | 1.3001*** (.0703) | 1.3013*** (.0713) | 1.3038*** (.0734) |
| lnrugdpd ^a | .2748** (.1141) | .1835 (.1149) | .1829 (.1154) | .2058* (.1114) |
| lndist ^a | -2.7795*** (.2238) | -2.7460*** (.2347) | -2.7874*** (.2313) | -2.7891*** (.2329) |
| contig | .2290 (.1576) | .0631 (.1783) | -.1436 (.2049) | -.1439 (.2060) |
| eu27_15 | | .8057*** (.1879) | | |
| group10_04 | | | .9806*** (.2005) | |
| group2_07 | | | .3515 (.2438) | |
| group10_before04 | | | | 1.0223*** (.2643) |
| group10_after04 | | | | .9567*** (.2643) |
| group2_before07 | | | | .4206 (.2777) |
| group2_after07 | | | | .1888 (.3267) |
| pol | | | | |
| constant | 2.5773 (3.1288) | -.0534 (3.1009) | -.2482 (3.0476) | -.4287 (3.0716) |
| Number observations | 275 | 275 | 275 | 275 |
| R-squared | .7172 | .7316 | .7374 | .7377 |
| Robust standards errors in parenthesis Statistically significant at the 0.01 level (***), at the 0.05 level (**) or at the 0.10 level (*) ^a logarithm | | | | |

Table 15

| Pooled OLS with robust standard errors | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| Dependent variable: Annual exports from the EU to Russia in machinery and transport equipments (in log) | | | | |
| Variables/Regressions | (1) | (2) | (3) | (4) |
| lngdpd ^a | 1.2296*** (.0641) | 1.3595*** (.0719) | 1.3605*** (.0729) | 1.3568*** (.0746) |
| lnrugdpd ^a | .6028*** (.1007) | .5352*** (.1011) | .5347*** (.1010) | .5112*** (.1061) |
| lndist ^a | -3.4420*** (.2107) | -3.4172*** (.2026) | -3.4530*** (.1977) | -3.4505*** (.1999) |
| contig | -.4842** (.1917) | -.6071*** (.2166) | -.7861*** (.2208) | -.7857*** (.2216) |
| eu27_15 | | .5967*** (.2156) | | |
| group10_04 | | | .7482*** (.2160) | |
| group2_07 | | | .2033 (.3558) | |
| group10_before04 | | | | .7259*** (.2795) |
| group10_after04 | | | | .7511*** (.2490) |
| group2_before07 | | | | .0586 (.4433) |
| group2_after07 | | | | .5582 (.3666) |
| pol | | | | |
| constant | -2.9669 (2.7472) | -4.9153* (2.6815) | -4.6540* (2.6155) | -3.9368 (2.8931) |
| Number observations | 275 | 275 | 275 | 275 |
| R-squared | .7613 | .7676 | .7710 | .7718 |
| Robust standards errors in parenthesis Statistically significant at the 0.01 level (***), at the 0.05 level (**) or at the 0.10 level (*) ^a logarithm | | | | |

Table 16

| Pooled OLS with robust standard errors | | | | |
|---|-----------------------|------------------------|------------------------|-----------------------|
| Dependent variable: Annual exports from the EU to Russia in other manufactured articles (in log) | | | | |
| Variables/Regressions | (1) | (2) | (3) | (4) |
| lngdpd ^a | 1.0893*** (.0462) | 1.1582*** (.0490) | 1.1600*** (.0495) | 1.1588*** (.0507) |
| lnrugdpd ^a | .3790*** (.0802) | .3431*** (.0771) | .3422*** (.0767) | .3107*** (.0821) |
| Indist ^a | -1.9996*** (.1610) | -1.9865*** (.1566) | -2.0496*** (.1548) | -2.0488*** (.1561) |
| contig | .3176** (.1458) | .2524 (.1592) | -.0628 (.1608) | -.0627 (.1599) |
| eu27_15 | | .3164** (.1560) | | |
| group10_04 | | | .5831*** (.1453) | |
| group2_07 | | | -.3763* (.2084) | |
| group10_before04 | | | | .4810*** (.1718) |
| group10_after04 | | | | .6631*** (.1778) |
| group2_before07 | | | | -.3106 (.2235) |
| group2_after07 | | | | -.5620 (.3808) |
| pol | | | | |
| constant | -5.1474** (2.0500) | -6.1806*** (2.1754) | -5.7205*** (2.1208) | -4.8380** (2.3355) |
| Number observations | 275 | 275 | 275 | 275 |
| R-squared | .8017 | .8044 | .8203 | .8214 |
| Robust standard errors in parenthesis Statistically significant at the 0.01 level (***), at the 0.05 level (**) or at the 0.10 level (*) ^a logarithm | | | | |

Table 17

| Pooled OLS with robust standard errors | | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Dependent variable: Annual exports from the last EU members to the EU and Russia (in log) | | | | | | |
| Variables/Regressions | (a) | (b) | (c) | (d) | (e) | (f) |
| lngdpd | .3661 (.2745) | .0389 (.2918) | .5098* (.2633) | .7849*** (.1679) | 1.5212*** (.1994) | .5447** (.2219) |
| lnrugdpd | .9009*** (.0270) | 1.0942*** (.0286) | .9238*** (.0256) | .9177*** (.0176) | .9541*** (.0215) | .9891*** (.0228) |
| Indist | -1.6257*** (.0650) | -2.2501*** (.0745) | -1.5059*** (.0565) | -1.5123*** (.0491) | -1.5994*** (.0568) | -1.7842*** (.0566) |
| contig | .8748*** (.0834) | 1.1543*** (.0970) | .6418*** .0802 | .5973*** (.0567) | .2059*** (.0806) | .3926*** (.0781) |
| EU27_15 | 1.1281*** (.0908) | .0886 (.1005) | 1.6278*** (.0858) | .4657*** (.0666) | .3097*** (.0732) | -.0599 (.0778) |
| RU | 1.0115*** (.1280) | -.9668*** (.1593) | 1.7435*** (.1216) | -.1215* (.0685) | .6426*** (.1132) | -.1711 (.1089) |
| ru_g10bef04 | 1.1438*** (.1815) | .1791 (.2952) | .3828* (.2026) | .4168*** (.0954) | .1241 (.2099) | .6562*** (.1445) |
| constant | -5.6195 (6.4075) | 1.7312 (6.9018) | -11.3602* (6.1998) | -15.48*** (4.0193) | -33.43*** (4.7196) | -9.7652* (5.2087) |
| Year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Exporter fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Number observations | 2,618 | 2,616 | 2,623 | 2,639 | 2,638 | 2,639 |
| R-squared | .7183 | .7270 | .7332 | .8145 | .8422 | .7801 |
| Robust standard errors in parenthesis | | | | | | |
| Statistically significant at the 0.01 level (***), at the 0.05 level (**) or at the 0.10 level (*) | | | | | | |
| (a) food and beverages / (b) raw material / (c) chemical / (d) manuf. goods by material / (e) machinery / (f) other manuf. articles | | | | | | |