

EUROPEAN UNION AND EXTERNAL TRADE OF CENTRAL AND EASTERN EUROPEAN COUNTRIES

Iryna Nasadiuk*

1. Introduction

Starting from 1990-s the countries of Central and Eastern Europe – Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia – had implemented structural reforms and modified their institutions to enter the European Union that eventually happened in 2004 (except for Bulgaria and Romania that joined EU a bit later in 2007). Economists usually connect EU membership with the strong economic growth of CEE countries in 2000-s due to the institutional reforms, participation in various forms of EU economic integration and substantial EU financial assistance. Nowadays above-mentioned CEE countries are full members of EU, participants of common market and part of EU commercial policy toward third countries. Soon CEE countries will join the European Monetary Union which is going to affect their trade flows as well.

The change in the external trade pattern as a result of the substantial trade policy change in CEE is of interest to Ukraine since our country has a large share of external trade with EU countries, and CEE countries specifically.

Thus, to identify structural changes in the external trade of CEE countries in terms of goods and geographical structure, as well as changes due to trade policy regimes, is the aim of the current paper.

How economic integration and trade policy instruments, such as free trade zones, customs union, preferential trade agreements, monetary union influence external trade turnover is usually analyzed in the framework of Viner's customs theory (Viner (1950)) [1, p.14-36] and microeconomics of economic integration discussed by R. Baldwin (1990) [2, p.21-35]. Common institutions and common currencies tend to decrease the transaction costs of trade between countries, raise price transparency and price competition, lessen currency risk that positively affects trade turnover between trading partners.

According to J. Viner there are two effects of certain economic integration modes (whether a preferential agreement or a common currency) – trade creation and trade diversion effects. The ground of trade creation effect is the increase of economic efficiency of trade between partners, since elimination of trade barriers favors the sellers with the minimum production costs. Trade diversion effect takes place for the 3rd countries that find themselves outside the economic integration group. Since heightened trade barriers for the third countries hinder their trade with the members of the integrated countries group, even if they sell and produce with less costs, the trade of the countries of the integration group with the third countries is expected to decrease. For example, Ukraine may face decreasing trade volumes with EU and CEE countries because it is out of economic integration process in Europe.

2. Statistical analysis of CEE external trade

Statistical analysis of the external trade of the discussed CEE countries in 1999-2009 – years of the intensive EU expansion, shows:

1) substantial growth in the external trade of CEE countries;

* Iryna Nasadiuk; PhD, docent; Department of International Economic Relations; Odessa State Economic University; Email: <irenas_ua@yahoo.com>

2) increase in technological intensity of the exports;

3) decrease of the role of EU countries and rise of the share of European developing countries in CEE trade.

First, from 1999 to 2009 the exports of Bulgaria grew 3.2 times, Czech Republic – 3.3 times, Estonia – 2.7 times, Hungary – 2.6 times, Latvia – 3.4 times, Lithuania – 4.6 times, Romania – 3.6 times, Slovenia – 3.4 times, from 2004 to 2009 the export of Poland grew 1.6 times and of Slovakia – 1.8 times [3].

Second, the quality of the external trade shows the progress in economic development of a country. Usually increase in technological intensity of the external trade is a sign of higher order of economic development of the national economy. In the process of entering EU the trade structure of CEE countries changed in a similar way. The export share of the most technologically intensive products – machines and equipment – grew for the most of discussed CEE countries. For example the share of machines and equipment in the exports of Bulgaria grew from 11.2% in 1999 to 16.9% in 2009, of Czech Republic – from 43.1 to 53.9%, of Estonia – from 24.2% to 26.7%, of Latvia – from 6.1% to 19.7%, of Poland – from 29.6% to 41.2%, of Romania – from 16.8% to 42.6%, of Slovakia – from 39.4% to 54%, of Slovenia – from 35.5% in 1999 to 40.2% in 2009. Only in Hungary and Lithuania the share of machines and equipment in exports stayed the same at the level of 57% and 17% correspondingly [4].

Third, the share of EU-15 countries (so called “old” EU countries) in the external trade of CEE countries has a tendency to diminish during the period of “intensive integration” 1999-2009. EU share in the total external trade of Bulgaria decreased from 50% in 1999 to 46% of the total trade in 2009, of Czech Republic – from 67% to 62% of the total trade, of Estonia – from 68% to 51% of the total trade, of Hungary – from 70% to 56% of the total trade, of Latvia – from 57% to 36% of the total trade, of Lithuania – from 49% to 37% of the total trade, of Poland – from 66% (2004) to 63% of the total trade, of Romania – from 62% to 57% of the total trade, of Slovakia – from 55% (2004) to 49% of the total trade, of Slovenia – from 68% in 1999 to 57% of the total trade in 2009 [3].

On the contrary the role of trading partners from developing Europe (Central and Eastern European countries themselves, Western Balkan countries and Former Soviet countries) in the external trade of CEE countries has been increasing for the last decade. In Bulgaria the share of developing Europe in the total trade increased from 24% in 1999 to 33% in 2009, in Czech Republic – from 20% to 24%, in Estonia – from 19% to 35%, in Hungary – from 13% to 27%, in Latvia – from 25% to 36%, in Lithuania – from 37% to 53%, in Poland- from 17% (2004) to 18%, in Romania – from 15% to 25%, in Slovakia – from 34% (2004) to 38%, in Slovenia – from 19% in 1999 to 26% of the total trade in 2009 [3].

Statistics show that in the process of EU integration the share of developed EU-15 countries is decreasing, while the trade with developing European countries is increasing much more dynamically. This fact suggests the fall of economic efficiency of external trade with “old” developed European countries. The reasons for this trend could be:

1) the trade with developing European countries is due to low costs due to lower labor costs of developing Europe countries;

2) CEE countries grant trade preferences to developing Europe countries in the framework of UN General System of Preferences;

3) CEE countries import price-inelastic fuels from Russia and Central Asia and, thus, report higher trade volumes with fuel exporters therefore.

The identification of CEE external trade factors, as well as test of the impact of above-mentioned factors is conducted in the regression model in the next paragraph. The research methodology for the regressions analysis is suggested by Micco and others (2003) [5, p.315-356] and Maliszewska (2006) [6, p.20-64].

3. Specification of the model

To analyze the factors that caused development of the Eastern and Central European countries external trade in 1999-2009 the following multifactor regression model is proposed:

$$\ln T_{ijt} = \beta_1 \ln Y_{jt} + \beta_2 Dist_{ij} + \beta_3 FTA_{ijt} + \beta_4 EU_{ijt} + \beta_5 EMU_{ijt} + \beta_6 GSP_{it} + \beta_7 GAS_{jt} + \varepsilon_{ijt} \quad (1),$$

where

$\ln T_{ijt}$ – logarithm of the total external trade (exports plus imports) turnover between countries I and j in a certain year,

$\ln Y_j$ – logarithm of the nominal gross domestic product of the trading partner j,

$Dist_{ij}$ – logarithm of the distance between capital of two countries i and j, in kilometers,

FTA_{ijt} – dummy variable, controlling for the fact that both country i and country j participate in a free trade area arrangement,

EU_{ijt} – dummy variable, controlling for the fact that both country i and country j are simultaneously members of EU,

EMU_{ijt} – dummy variable, controlling for the fact that trading partner j is the member of European monetary union in a corresponding year,

GSP_{it} – dummy variable, controlling for the fact that Central and Eastern European country i grants trade preferences to trading partner j under General System of Preferences. Central and eastern European countries that joined EU in 2004 and 2007 grant such preferences to the developing countries of Europe – Balkan countries and Former Soviet Union countries,

GAS_{jt} – variable, controlling for the trading partner j that supplied fuel products (oil and gas) to Central and Eastern European country i. Usual fuel exporters for CEE countries are Russia, Kazakhstan and Turkmenistan,

ε_{ijt} – this part of the dependent variable is responsible for the factors that are not included on the model but practically influence turnover volume between trading partners in a corresponding period of time. They can be of systematic or spontaneous nature.

The regression model is based on the gravity model of external trade that is commonly used in economic literature to determine the impact of the most important indicators of external trade - domestic and foreign income, and transport costs.

As it is known, the exports of a country are positively related to the income (gross domestic product variable) in the trading partner countries, imports of a country are positively interconnected with the domestic income (GDP of a country).

The larger the transport costs to deliver goods from one trading partner to another, the less trade volume is between them.

Distance is commonly used as the approximation indicator for transport costs in export operations. In this article gravity model variables are included in regression expression, since gravity variables are expected to clear the external turnover from the effect of fundamental variables (income and transport variables) to obtain the clear effect of trade policy factors.

The interrelation under question is the impact of various trade regimes and monetary conditions of trade on the trade of CEE countries.

Regression model is estimated for the following Central and Eastern European countries (countries i): Czech Republic, Hungary, Poland, Slovak Republic, Slovenia, Romania, Bulgaria, Estonia, Latvia and Lithuania.

The turnover of each country i is estimated in relation to the following trading partners (major trading countries): euro zone (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Slovenia, Slovak Republic); Western European countries non-members of EMU (Denmark, Iceland, Norway, Sweden, Switzerland), big developed countries (Australia, Canada, Japan, New Zealand, USA), Asian new industrial countries (Hong Kong, South Korea, Singapore, Taiwan, Malaysia, Philippines, Indonesia, Thailand, India, China), Balkan and Former Soviet countries (Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Bulgaria, Belarus, Serbia, Georgia, Croatia, Kyrgyz Republic, Kazakhstan, Moldova, Montenegro, Russia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan), Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Bulgaria, Romania.

Thus, the annual trade between a CEE country and 61 trading partner during 11 years (1999-2009) is analyzed rendering over 600 observations for every CEE country.

Information concerning the geographical structure of the exports and imports of Central and Eastern European countries is taken from “External Trade” Eurostat database [3]. IMF World Economic Outlook Database gives annual data on gross domestic product in 1999-2009 for the countries involved [7].

The facts concerning the trade regimes of CEE countries (free trade zones, EU, EMU, CEFTA, Baltic free membership) are taken from the source of Wikipedia and European Union site [8; 9].

Reference materials of UN are used to estimate countries participation in general System of Preferences [10].

Reference on the geographical distance between countries is taken from the source of MapCrow Travel Distance Calculator [11].

Coefficient β_1 shows the percentage of the change of external turnover (export plus import) between countries i and j in case GDP of country j rises by 1%. Larger economic potential of CEE country trading partner is expected to cause greater level of trade turnover between countries.

GDP variable allows cleaning out the external trade indicators from the effect of such important factor as income (GDP). Thus, the influence of trade policy factors, such as participation in preferential trade agreements, the issue of the current discussion, can be determined.

Parameter β_2 estimates the interconnection of the distance between trading partners and trade volumes between them. Distance between capital cities indicator is the approximation of the transport costs related to international trade transactions. The greater the distance between trading partners, the less beneficial the trade operations and trade volume between them are.

Parameter β_3 is related to dummy variable and shows the percentage by which the trade between two countries is higher in case they both belong to a free trade area. Positive and significant coefficient value is expected. Participation in a free trade area lessens external trade and, thus, causes larger volumes of exports and imports.

Discussed CEE countries have been members of the various free trade zones before entering EU – free trade zones with 15 “old” countries of European Union, Baltic free trade zone, Central European free trade area. After entering EU Central and Eastern European countries – Czech Republic, Hungary, Poland, Slovakia, etc. – as EU members concluded free trade agreements with Western Balkan countries that will form the “next” wave of EU expansion.

Coefficient β_4 is expected to have a positive sign showing that external trade in the framework of EU common market, raises external trade even more than free trade zone membership.

Parameter β_5 is responsible for the relation of external trade of a CEE country and CEE country's trading partner membership in European monetary union. Expected positive sign is going to show that on average CEE country has greater trade volume with euro zone country than with non euro zone country. Thus, positive sign is the evidence of the absence of trade diversion effect of a monetary union on trade, while negative sign is the evidence that external trade creation is in effect.

Parameter β_6 is going to give an answer whether UN General System of Preferences employed by "new" EU members has significant influence on the external trade of CEE countries with countries in Europe outside European Union – Western Balkan countries and Former Soviet republics. The sign of the parameter is expected to be positive, since simple statistical analysis of CEE external trade reveals dynamic development of CEE trade with less developed countries of Europe, the role of GSP is probably significant in this process.

Coefficient β_7 is aiming to define effect of increase in fuel prices on the trade volume. Since energy products demand is not price elastic in time, substantial rise in fuel prices increases the import volume of CEE countries. Since Russia, Kazakhstan, Azerbaijan and Turkmenistan are fuel exporters to the Central and Eastern Europe, their trade is expected to be higher with CEE region than other factors may envisage.

Thus, econometric estimation with the use of OLS method rendered the following results represented in the table 1.

Tab.1: Estimated coefficients of regression model for each analyzed CEE country

	R ²	DW	β_1 (lnY)	β_2 (Dist)	β_3 (FTA)	β_4 (EU)	β_5 (EMU)	β_6 (GSP)	β_7 (GAS)
Bulgaria	0.49	1.86	0.548	-0.419	0.107	0.108	0.124	-0.063	0.188
t-stat			16.02***	-10.43***	2.54**	3.5***	3.59***	-2.09**	6.44***
Romania	0.49	2.06	0.584	-0.326	0.190	0.101	0.093	-0.078	0.159
t-stat			17.13***	-8.29***	4.60***	3.26***	2.67***	-2.55**	5.43***
Czech	0.65	1.69	0.653	-0.312	0.177	0.160	0.062	-0.168	0.169
t-stat			22.94***	-8.98***	4.55***	5.55***	2.11**	-6.25***	6.95***
Hungary	0.61	1.51	0.683	-0.303	0.317	0.116	0.083	0.184	0.170
t-stat			22.49***	-8.38***	3.40***	3.81***	2.69***	-6.47***	6.66***
Poland	0.74	1.54	0.679	0.646	-0.527	0.464	-0.059	-0.565	0.191
t-stat			19.27***	-12.82***	-8.15***	9.98***	-1.59	-12.14***	6.64***
Slovakia	0.68	1.91	0.690	-0.567	-0.498	0.415	-0.142	-0.625	0.217
t-stat			18.34***	-9.89***	-6.75***	8.14***	3.48***	-12.16***	6.80***
Slovenia	0.55	1.67	0.50	-0.331	0.245	0.081	0.043	-0.204	0.163
t-stat			16.45***	-8.05***	5.44***	2.53**	1.3	-6.48***	5.91***
Estonia	0.44	1.3	0.552	-0.318	0.030	0.225	0.022	0.130	0.164
t-stat			15.65***	-7.58***	0.643	6.19***	0.60	-3.81***	5.30***
Latvia	0.43	1.4	0.487	-0.346	0.022	0.275	0.016	0.068	0.211
t-stat			13.42***	-8.11***	0.455	7.53***	0.420	-1.99**	6.78***
Lithuania	0.44	1.46	0.407	-0.369	0.158	0.242	-0.021	-0.029	0.174
t-stat			11.55***	-8.79***	3.34***	6.70***	-0.579	-0.858	5.76***

Source: computed with the use of SPSS program

** – significant at 5% level

*** – significant at 1% level

4. Results of the estimated model

1. The gravity equation hypotheses proved right for all discussed countries of CEE region: external trade volume is positively and significantly related to the economic potential of a trading partner. CEE countries partner's GDP rise by 1% is related to trade level increase by 0.5-0.6%.
2. Transport costs have substantial influence on the geography of external trade. Parameter β_2 is negative and statistically significant. The far are the trading partner are from each other, the higher the transport costs are and the less is trade turnover between them.
3. The influence of free trade zone participation is positive for all discussed CEE countries, except Poland and Slovakia (it may be due to the fact that for these countries data only for the period of 2004-2009 is available). Obtained coefficients are statistically significant. Participation in a free trade zone raises external trade volume of Bulgaria by 11% ($\exp(0.107)-1$), of Romania – by 21%, of Czech republic – by 19%, of Hungary – by 37%, of Slovenia – by 28%, of Latvia – by 17%. Statistically significant results for Estonia and Latvia were not obtained.
4. Coefficient at dummy variable responsible for EU membership is positive and significant for all discussed CEE countries, suggesting positive influence of EU common market on CEE countries' external trade. External trade of Bulgaria was on average 11% higher ($\exp(0.108)-1$) during EU membership then without it, in case of Romania – 11%, Czech Republic – 17%, Hungary – 12%, Poland – 59%, Slovakia – 51%, Slovenia – 8%, Estonia – 25%, Lithuania – 32%, Latvia – 27% higher.
5. Estimated coefficient at the dummy variable controlling for EMU membership of a trading partner gave unanimous results. The coefficient is positive in case of Bulgaria, Romania, Czech Republic, Hungary, Slovenia suggesting trade creation effect, rather than trade diversion effect for the CEE countries and negative in case of Poland and Slovakia suggesting trade diversion effect (again may be due to non-completeness of trade data for these countries). Obtained coefficients for Baltic countries are not significant, probably due to larger role of North European countries in their external relations.
6. The results of estimated coefficient at the variable controlling for the General System of Preferences policy of CEE countries, except Latvia, are not expected. Obtained negative coefficients are statistically significant; they suggest that Former Soviet countries and Western Balkan countries, beneficiaries of GSP preferences, have on average smaller trade volumes with CEE countries.
7. Positive coefficient at the dummy variable responsible for fuel exports shows that fuels exporters do on average have higher volume of trade with discussed CEE countries.
8. The model shortcomings are low level of determination coefficient R^2 and autocorrelation problems for the estimated regressions for certain countries.

5. Conclusions

The article identifies the structural changes in external trade of CEE countries in terms of goods and geographical structure, as well as changes due to trade policy regimes in the period of 1999-2009 – time of EU entry preparation and actual EU membership. Statistical analysis of the trade volumes shows substantial growth in external trade of CEE countries in 1999-2009, increase in technological intensity of CEE exports, decrease in the role of “old” developed EU countries in CEE trade, but the rise in the share of developing Europe in CEE exports and imports volume.

Regression analysis of CEE external trade in 1999-2009 reported positive influence of such trade factors as free trade zone participation and EU membership that tend to increase trade.

The partner's belonging to EMU in Europe doesn't seem to cause trade diversion effects for most of CEE countries except Baltic States. The trade preferences under General System of Preferences that CEE countries grant to non-EU developing European countries are proved to have negative effect on their external trade. The imports of fuels from Russia and Central Asia do cause higher levels of CEE trade with fuel-exporting countries.

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Summary

The article identifies the structural changes in external trade of CEE countries in terms of goods and geographical structure, as well as changes due to trade policy regimes in the period of 1999-2009 - time of EU entry preparation and actual EU membership. Statistical analysis of trade shows substantial growth in external trade of CEE countries, increase in technological intensity of CEE exports, decrease in the role of “old” developed EU countries in CEE trade, but the rise in the share of developing Europe in CEE exports and imports volume in 1999-2009. Regression analysis of CEE external trade in 1999-2009 reported positive influence of such trade factors as free trade zone participation and EU membership, fuel-exporter status and negative influence of General System of Preferences. In general external trade of CEE countries in 1999-2009 fits the expectations of the gravity model of trade.

Keywords: Central and Eastern Europe; external trade; European monetary union, European Union; economic integration.

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