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Irina Tochitskaya, Ernest Aksen

Economic Effects of Belarus' Participation in the CIS Countries Customs Union

Abstract

In 1995 three countries of the former Soviet Union (Russia, Belarus and Kazakhstan) established a Customs Union, which Kyrgyzstan and Tadjikistan joined later. After the passage of five years since the Customs Union formation, it is essential to assess the implications of Belarus' membership in this Customs Union. The objective of this project is the analysis of the costs and benefits of the Belarus' participation in the Customs Union of the CIS countries based on the study of the static and dynamic economic effects and their impact on the nation's welfare, and the Belarus' economy growth rate. As the evaluations of Belarus' participation in the Customs Union by the country's government and political opposition are completely opposite, a politically independent analysis is of principal importance.

Final Report

ECONOMIC EFFECTS OF BELARUS' PARTICIPATION IN THE CIS COUNTRIES CUSTOMS UNION

Irina E. Tochitskaya, Ernest M. Aksen

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Final Report

Abstract: The authors analyze the static and dynamic economic effects of Belarus' participation in the CIS countries Customs Union in 1995 - 2000. Utilizing the set of methodologies proposed in literature it was proved that Belarus' membership in CIS regional trade arrangement results in trade diversion effects especially in the group of medium and high-tech products. Econometric evaluation focuses on the assessment of the impact of the Customs Union on revealed comparative advantage, which was calculated for group of medium- and hi-tech products as easily interpretable measure of their competitiveness and efficiency of production. Two sets of independent variables have been used: those reflecting possibility of technology, knowledge transfer and those reflecting regional integration. It is shown that Belarus' participation in the Customs Union does not facilitate the improvement in the domestic exports structure, the formation of the new comparative advantages both in trade with CU member countries and the rest of the world.

JEL classification: **F14, F15**

Keywords: Regional economic integration; Static effects; Dynamic effects

1. Introduction

The last ten-fifteen years have been evidence of the trend towards new wave of regional economic integration. Turning into the dominant factor of the world trade, regionalism affects both economic and political relations between countries, confronting them with the choice should they enter trade agreement, which form of integration should be preferred and who should be a partner.

Such questions have been discussed among new independent states after break up of the USSR. The impetus for the creation of regional arrangements among CIS countries was the aspiration to maintain and restore the economic ties as well as desire to remain in traditional export markets and to decrease the competitive pressure from the rest of the world by using high external trade barriers. As a first attempt of trade cooperation the protracted process of CIS counties Free Trade Zone formation should be considered. Besides in 1995 three countries - Belarus, Kazakstan and Russia - established a Customs Union (it was renamed in Eurasian Economic Community in 2001) that Kyrgyz Republic and Tajikistan agreed to join in 1996.

Belarus membership at this regional agreement strongly affects the county's economy. First, it was accompanied by a reorientation of trade flows towards the members of the Customs Union. According to Belarusian trade data in 1995 the country exported 54% of goods outside the trade block, yet in 2000 this figure fell to 46%. The same tendency occurred in imports where the share of the rest of the world decreased from 54% in 1995 to 36% in 2000 (table B1). As to the trade with traditional CIS partners (non-members) the 2000 share of the country's exports (14%) and imports (7%) were almost two-time lower than the corresponding 1995 level. However, according to EBRD estimations all transition economies should amount no more than 11% of Belarus external trade while EU countries - up to 60% (EBRD, 1999). Second, the Customs Union members negotiated a common external tariff based on Russian tariff system. As a result Belarusian average unweighted tariff rose in 1995 -2000 from 12.3% to 13% and in manufactured products up to 15%.

Since more than six years passed after Belarus' joining the Customs Union, it is useful to make more detailed analysis of the implication of above trends on Belarusian economy and assessment whether membership in the CIS countries CU is an efficient element of the national development strategy.

So far a large number of theoretical and empirical studies focus on the problems (welfare effects, labor migration, exchange rate agreements, real convergence and etc.), faced by regional blocs that were formed between high-income countries and developing countries or both of them (NAFTA). However literature considering the process of trade bloc formation among CIS countries and examining the issues arising within this regional group, in particular the economic and political effects on the partners is not extensive.

The objective of this project is the analysis of the costs and benefits of the Belarus' participation in the Customs Union of the CIS countries based on the study of the static and dynamic economic effects and their impact on the nation's welfare, and the Belarus' economic development.

The modern approaches to the study of the regional integration rely on constructing the models estimating the changes in commodity prices, in volumes and structure of the production in different sectors, gains and losses of producers, consumers and the state resulting from the mutual elimination of the customs duties and creation of the joint customs barriers, as well as growth models including intermediate import as a conduit for technology and knowledge transfer. We propose to verify the following hypotheses based on these approaches:

- The hypothesis about the appearance of the trade diversion effect in the trade in medium- and high-tech products due to significant reorientation of Belarus' foreign trade flows to the Customs Union partner countries, first of all to the Russian Federation.
- The hypothesis about the absence of "potential dynamic benefits" based on the assumption that the Belarus' participation in the Customs Union does not facilitate the attraction of modern technologies and production factors to the economy, the acquisition of the new comparative advantages in high-tech sectors and are likely to retard Belarus' economic transformation to high-R&D economy.

The paper is organized as follows. The next section introduces the review of literature; Section 3 explains the model specification issue; Section 4 describes the empirical methodology and contains results of the empirical estimations, and Section 5 concludes.

2. Review of literature

The formation of the economic integration theory is associated with the works of J. Viner (1950), J. Meade (1955), R. Lipsey (1960) that have assessed the consequences of joining a regional trade agreement (CU, FTA) from the viewpoint of welfare effects of the removal of tariffs and the introduction of the common external tariff on trade. The reduction of the barriers increases the gain from trade in the case when the importer from the partner country substitutes less efficient (higher costs) domestic suppliers, the result is trade creation effect. Unlike this, trade diversion effect arises when the lower-cost imports from outside of the customs union (free trade zone) are displaced by the output of a partner country because of the distorting impact of the tariffs. The important question is whether negative net effect of trade diversion is inevitably generated outcome resulting in welfare reduction. This is still a much-discussed topic among trade economists.

Lipsey (1957) and Bhagwati (1971) examined the issue of the welfare impact of RIAs on the assumption of zero demand elasticity in member-country and proved that wholly trade-diverting union may lead to a net increase in welfare.

Kemp, Wan (1976) and Ohyama (1972) argued in the case of customs union that it is possible to enhance welfare adjusting the common external tariff at a level just proper to fix the initial extra-union trade flows. However as to the individual members, either outcomes (gain or lose) may occur. Panagariya (1999) provided the analogous result for a large union example keeping external tariffs at initial levels.

There is also “natural-trading-partner” hypothesis according to which trading partners are more likely to gain from regional integration agreements the higher is the intra-regional shares in total trade (Krugman, 1993). However, Schiff’s (1997) analysis provides an opposite conclusions: an individual country benefits more from RIAs if it imports less from its partner countries (with imports measured either in volume or as a share of total import). The result holds both in the small country and the large-country case.

The standard techniques of estimating the impact of the above effects on the member countries’ welfare are the general and partial equilibrium models as well as econometric evaluations. The most applications were to the European Union and its extension, North American Free Trade Area (NAFTA) and Latin America trade agreements (Winters (1987); Harrison, Rutherford, Tarr (1996); Bakoup, Tarr (1997)). For the purposes of our research, the applied studies considering the trends in the foreign trade of the CIS countries in the period of the Customs Union formation are of a certain interest. For example, R.Gonzales , J. Farell (1996), by using general equilibrium model, analyzed whether joining the Customs Union of the CIS countries were beneficial or damaging for Georgia 's economy. The study derived implication of joining the Customs Union as welfare losses equal 8,6% of total imports and in addition 36% decrease of tariff revenues. In their turn Fridmuc and Fridmuc (2000) determined by employing gravity model that Belarus traded with Russia (the main CU partner) 40 times more than it could be expected.

Michalopoulos, Tarr (1997) based on the partial equilibrium model considered the static effects of CU within the CIS for the countries, which had lower external tariff before joining. As a result of the assessment of the consequences of the adoption of the common tariff system it was concluded that the given preferential trade agreement leads to welfare losses.

Econometric models have been also used to study trade diversion and trade creation effect using wide range of variables e.g. trade, GDP, labor, physical capital data and information about changes in tariffs for a post- and pre-RIA years (Sapir (1992)). The present paper takes very different approaches, which literature provides for *ex-post* estimations of the static effects of regional integration. Specifically it uses Truman's methodology that is based on the analyses of the components of apparent consumption: domestic production (net from export), intra-RIAs imports and extra-RIAs imports for the period prior the establishment of regional grouping and after the integration process has been well under way. Second, an approach has attempted to capture what trade flows would have been in the absence of integration and to compare them with the actual.

Besides we use the approach put forward by Yeats (1997). It is based on the examining of changes in the intensity of trade and regional orientation indices in connection with revealed comparative advantage index. First of indices shows whether intensity of trade between counties is in conformance with what would be expected from their shares in global trade. Estimations of changes in these three indices, when used jointly, provide information whether trade evolves along with country's comparative advantage and efficiency conditions. In other worlds, whether the country can export goods in which the increase of intensity and reorientation of trade towards the RIA is observed competitively to the rest of the world (ROW) countries. The negative answer testifies to existence of trade diversion.

Besides the static effects the literature on regional integration traditionally draws attention to the dynamic effects, i.e. how the participation in the trade block can influence the productive capacity and growth of member states.

Contributions to the literature on growth effects of RIAs focus on techniques ranging from theoretical modeling to simulation exercises, and econometric evaluations. However as Tarr and

Michalopoulos (1997) noted, such effects are still difficult to define and even more difficult to measure. Good example of this is the work of Baldwin and Venables (1995) that provides a useful survey of recent type of econometric evaluations and points out that this aspect is far from mature.

One of the reasons is that the dynamic gains unlike static are complicated phenomena that can accrue from separable and even unrelated avenues. For example Brada and Mendez (1988) grouped them into two broad categories: first, increase of output growth through the increment of the rate of growth of factor inputs, and second, growth of total factor productivity due to acceleration of technological progress within the trade blocks. The sources of gains may also arise from agglomeration, internal economies of scale, convergence in the income levels of member countries and etc. All this diversity of ways through which the RIAs can affect the growth of economy makes extremely difficult to capture them by using a single model.

The overwhelming majority of recent theoretical contributions to the literature on growth effects use Solow's neo-classical growth model as analytical tool. This paper proposes model features the impact of the country's participation in the Customs Union on firm's possibility of obtaining modern technologies and production factors through trade, which is an essential conduit of foreign R&D.

Empirical evaluations prove that import of capital equipment and intermediate goods from viewpoint of technology transfer might have a positive effect on country's growth. . D.Coe и E.Helpman (1995), who seek to explain the rates of the growth of the total factor productivity across the OECD and developing countries, constructed the index of total knowledge capital in each industrial country based on the investments directed into R&D. As a starting premise, they assumed that trading partners get access to so called stock of knowledge (accumulated investments into R&D) proportionally to their imports. The results of the studies showed the

high degree of the dependence between the growth in the total factor productivity and openness to the countries that have the largest knowledge stock. In her turn, Madani (2000) examining the implications of Bolivia, Colombia and Ecuador membership in Andean Pact found that imports of intermediate goods from the rest of the world facilitate economic growth unlike intra-block imports. A resent example of this approach is work undertaken by Schiff M., Wang Y., Olarreaga M. (2002) investigating the impact on TFP of North-South and South-South trade-related R&D spillovers. The main findings are that North-South RIAs have a positive impact on the development of R&D intensive industries, while South-South RIAs will tend to favor the development of low-R&D intensive industries. These results have implications for dynamic comparative advantage since South-South RIAs are likely to slow down the acquisition of the new comparative advantage in the high-tech sectors by reducing technology spillover from the North. Based on this evidence, we consider in our investigation the impact of CU (rest of the world) medium- and hi-tech imports as a share of total imports on comparative advantage computed for a set of traded goods.

The study of the interrelation between the geographical direction of the trade flows and the change in exports structure, and, consequently, in the competitive ability of the manufactured products has been done in the work of B. Hoekman, S. Djankov (1997) on the example of the countries of the Central and Eastern Europe. The conducted analysis confirmed that these changes are explained, to a great extent, by the imports of the high-tech production factors coming from the EU.

An important focus of the debate surrounding all RIAs is how such arrangements may affect inward and outward foreign direct investment flows in the integrating region. Recent theoretical and empirical studies have posited that it is difficult (or even impossible) to make general predictions regarding the results of RIAs on foreign direct investment decisions. In fact, the

existing literature provides evidence that the impact of integration agreement on FDI flows depends, in each individual case, on the change in economic environment brought about by the RIA, the locational advantages of the participating countries and industries (Blomstrom and Kokko (1997)), and the motives for foreign direct investment. Effects are likely to vary between small and large countries, developed and developing countries, and different integration agreements (North-North, North-South, South-South). One concern raised in the discussions over investment impact of RIAs is whether FDI may actually be an essential catalyst for dynamic benefits, e.g. stimulating technology transfer and diffusion, both directly and through *spillovers* to local firms.

In the present analysis, however, nothing can be said about the relation between regional integration and foreign direct investment in CIS countries customs union since there is no evidence that CU causes any changes in the inflows of FDI to Belarus. The main reasons for such impact are probably that the liberalization and macroeconomic stabilization (e.g. comprehensive privatization program, which opens several industries to foreign investment.), strong property, legislative and regulatory environments surrounding foreign ownership rights appear to have been a more important determinants of FDI inflows to countries like Belarus than the regional integration is. In addition it should be noted that as Blomstrom and Kokko (1997) ague in the case of South-South RIAs (the type of CIS countries CU) the inflows of FDI to the region are not likely to be distributed equally to all participating countries. It is reasonable to assume that in the regional arrangement in question Russia will be the main beneficiary of FDI inflows.

3. Model

We estimate the impact of the country's participation in the Customs Union on the possibility of obtaining modern technologies and production factors, and, consequently, on its productivity growth with the help of the following model.

Let a Belarussian firm (using the high-tech product as a production factor) maximize the utility $u = u(\pi_1, \pi_2)$. Here π_1 is the firm's profit at present, and π_2 is the profit in the future.

We assume that the present profit π_1 and the future profit π_2 are determined as follows:

$$\pi_1 = R(q) - P \cdot q, \tag{1}$$

$$\pi_2 = \pi_2(q). \tag{2}$$

Here P and q are respectively the price and quantity of the high-tech product used by the Belarussian firm in the production process at present. The expression (2) means that the efficiency of the firm's production in the future, and, therefore its future profit, depend on the level of utilization of the high-tech production factor at present. (The future profit rises with the increase in q.)

For the given price P, the firm chooses the level q of the high-tech product utilization maximizing the utility level $u = u(\pi_1, \pi_2)$, where π_1 and π_2 are defined by formulas (1) and (2).

For simplicity, assume that there exists some critical level q^* of the high-tech product utilization at present such $\pi_2(q) = \pi_2^-$ for all $q \le q^*$, and $\pi_2(q) = \pi_2^+$ for all $q > q^*$ (and π_2^+ is significantly higher than π_2^-).

This assumption is interpreted as follows: a sufficiently high level of the high-tech product utilization at present has a big positive impact on the efficiency of the firm's production processes in the future.

Then the solving of the utility maximization problem will reduce to the maximization of the present profit π_1 for $q \le \bar{q}$ and for $q > \bar{q}$.

Denote by π_1' the maximum value of π_1 for $q \le \bar{q}$, and by π_1'' the maximum value of π_1 for $q > \bar{q}$ (i.e. π_1' is the maximal possible profit at present for the "low" utilization of the high-tech product, and π_1'' is the maximal possible profit at present for the sufficiently high utilization of the high-tech product.) It is obvious that $\pi_1' = \pi_1'(P)$, $\pi_1'' = \pi_1''(P)$, i.e. the profit at present depends on the price of the high-tech product.

It can be easily seen that the maximal value of the manager's utility will be equal to $\max\{u(\pi_1'(P), \pi_2^-), u(\pi_1''(P), \pi_2^+)\}$.

And, as the price P rises, both $\pi_1' = \pi_1'(P)$ and $\pi_1'' = \pi_1''(P)$ fall. However, $\pi_1'' = \pi_1''(P)$ falls quicker than $\pi_1' = \pi_1'(P)$ does. (For the proof see Appendix A.) Moreover, for the sufficiently high price P, the profit $\pi_1''(P)$ becomes negative, while $\pi_1'(P)$ remains positive. Therefore, due to the fact that losses at present are extremely undesirable for the firm, the decision is made not to use (or almost not to use) the high-tech product at present, although such a decision has an extremely negative impact on the efficiency of the firm's production processes in the future. Thus, since high tariffs on the high-tech product imports from the ROW countries lead to a significant rise in the prices for this product in Belarus, this, finally, has an extremely negative impact on the efficiency of the Belarus' economy in the future.

4. Empirical Testing of the Hypotheses

4.1. Static Effects

Despite the existence of a variety of methods for estimating the effects of preferential trade arrangements on trade flows it is still considered that static effects are difficult to measure. The

most commonly used approaches put forward over last decade are partial and general equilibrium models, which enable by creating computer model of economy to explore the changes in real incomes, production in each sector of economy and prices on factor inputs. However these models require the large number of primary data that unfortunately often are not available, therefore in this investigation some of other approaches proposed in literature have been utilized.

As a first step Truman's methodology is employed for estimation of the static trade effects of Belarus joining the CIS Customs Union. It based on analysis of alteration of the shares of apparent consumption, i.e. domestic production (excluded export), extra-RIAs imports and intra-RIAs imports for the pre- and post-integration period.

For the computation the data was obtained from input-output tables of the Ministry of Statistics and Analysis of the Republic of Belarus for fifteen industries of manufacturing sector over the period 1993-1999. Table B4 presents the changes in the shares of the components of apparent consumption for main Belarusian industries. As the table shows for the manufacturing sector as a whole and for each of industries under consideration excluding chemistry and petrochemistry reduction of the consumption from domestic suppliers occurred. Simultaneously for machine-building and metal-working, wood and wood-proceeding industries and all manufactures from 1995 (the year when CIS Customs Union was established) the share of intra-union suppliers steadily increased while the share of consumption from the rest of the world suppliers fell testifying that trade diversion apparently dominates. This is especially true for the case of machine-building and metal-working industry where part of domestic suppliers decreased for the period 1995-1999 from 54% to 24% whereas intra-union imports rose from 17% to 45% and concurrently the share supplied by extra-union partners declined from 29% to 22%. For the power and petrochemical industry as well as light industry in different periods trade diversion

coexisted with trade creation consequently the net effect is not so evident and presupposes the need of further investigation.

Therefore approach is employed, which presumes more detail analysis of trade creation and trade diversion effects based on comparison of the actual trade flows with hypothetical one that would have been in the absence of integration. As a basis, the procedure is used, which considers the changes of the share of imports from rest of the world partners in the apparent consumption before and after joining the RIAs (Kreinin, 1972). Deviation of the existent share from expected one is attributed to the static effects of regional integration. The following formula is utilized for estimation of trade diversion effects:

$$TD = N_{99} - \left[\left(n_{95} - n_{93} \right) 6/5 + n_{95} \right] C_{99} \qquad (3)$$

where:

N- imports from the rest of world countries; *C*- consumption, computed as output minus exports plus imports; $n=N/C$- share of imports from the rest of the world in consumption. The result of computation with the negative sign testifies trade diversion towards the Customs Union suppliers, i.e. imports from non-member countries is less than it can be expected taking into consideration how it was developed at pre-integration period*.

Trade creation is estimated as follows:

$$TC = M_{99} - \left[\left(m_{95} - m_{93} \right) 6/5 + m_{95} \right] C_{99} \qquad (4)$$

where:

M- imports; $m=M/C$ the share of imports in consumption.

* pre-integration data can be obtained from national statistics only for the period 1993-1995

The computation for fourteen major industries in table B5 reveal that trade diversion is not observed only in non-ferrous metallurgy and food industry. The largest diversion occurs in machine-building and metal-working, wood and wood-proceeding industries amounted to 30-40% of their imports. These results are in line with Truman's methodology.

It is of interest to note that most of industries under consideration and all manufactures as well have not experienced trade creation (the estimations have a negative sign). This results from the fact that before joining the Customs Union member-state producers and especially from Russia as a main trade partner could supply their products to Belarusian consumers without any tariff. Therefore the appearance of trade creation effect is possible only in products that had tariff in pre-integration period higher than in the post-integration. Consequently prevalence of trade diversion effect and hence welfare losses is experienced in chemistry and petrochemistry, light, wood and wood-proceeding, machine-building and metal-working industries. Moreover for the latter from above mentioned industries this predominance is the most considerable and most alarming as this industry plays a key role in the Belarusian economy and produces overwhelming majority of R&D intensive goods.

The emphasis on this group of commodities is done due to their high share in the Belarus' export structure (especially to the CU countries), strong dependence on imports (at the production of this commodity group only 10% of domestic parts and equipment are used), high export share (70% - 90%) with regard to the volume of industrial production, and also because the changes in the structure of exports and regional orientation for this commodity group can be an indicator of how efficient their production is and whether its restructuring occurs. (Hoekman, Diankov, 1997).

In this connection it is interesting to analyze whether trade diversion effects occurred in this group of products when consider CIS Customs Union integrally. For the study we utilize

techniques proposed by Yeats (Yeats, 1997). Note that analysis of the effects of participation in preferential trade agreements focus as a rule on the changes occurring from the imports side. Yeats methodology employs the approaches based on the exports, which allow, in particular, to consider the issues related to the production efficiency. Based on the comparison of regional trade orientation index* and the index of revealed comparative advantages** for the ROW countries in the selected commodity group we estimate how much the regional trade orientation conforms to the comparative advantages or, in other words, whether the commodities characterizing by the growth of exports to the CU have costs low enough to be competitive in the ROW markets, where they are not protected by preferential trade barriers. Thus we conform or refute the presence of trade diversion effect. Note that by itself the regional trade orientation index is not sufficiently informative. For the purposes of our research, its change in the short- and medium-run period is of higher interest. Since during relatively short time period the change in the transport costs, consumers' tastes are minimal, it is usual to think that it is more affected by the trade barriers.

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* $RO(t,i)$ -- index of regional orientation for commodity i and period t was computed using following formula

$$RO(t,i) = \frac{Ex\_CU(t,i)}{Ex\_ROW(t,i)}$$

Formula sets aside the case when $Ex\_ROW(t,i) = 0$

** $RCA\_ROW(t,i)$ -- index of revealed comparative advantage for commodity i and period t was computed using formula (OECD methodology):

$$RCA\_ROW(t,i) = \begin{cases} \dfrac{Ex\_ROW(t,i) \div Im\_ROW(t,i)}{[Ex\_ROW(t,i) \div Im\_ROW(t,i)] + [Ex\_ROW(t) \div Im\_ROW(t)]} \\ \text{if} \quad Im\_ROW(t,i) \neq 0, \\ \\ 0.5 \quad \text{if} \ Im\_ROW(t,i) = 0 \ \text{and} \ Ex\_ROW(t,i) = 0, \\ \\ 1 \quad \text{if} \ Im\_ROW(t,i) = 0 \ \text{and} \ Ex\_ROW(t,i) \neq 0. \end{cases}$$

The analysis is based on the official trade data of Belarus' Ministry of Statistics and Analysis for the period 1995 - 2000 at the four-digit level. From this, we selected 203 medium- and hi-tech goods (according to the classification of OECD) relating mostly to R&D intensive industries (R&D intensity is based on US data).

During the period 1995 - 2000 the share of the group of medium- and hi-tech commodities increased in the export to the CU countries from 36% to 39% while the share of the ROW countries reduced from 25% to 12%. As the data of table B6 show, the increase in the regional trade orientation coefficient was for 137 commodities (68%) out of the 203 commodities under consideration, at the same time the fall in the comparative advantages occurred for 112 (82%) commodities out of the group of commodities for which the strengthening of the orientation towards the CU countries occurs. At the same time only 12 commodities for which the trade intensity increased are competitive in the ROW markets, which are not protected by trade barriers. As to the selected group of medium- and hi-tech commodities as a whole, with the growth of the regional orientation coefficient over the considered time period from 1,56 to 3,41, the revealed comparative advantages in the ROW markets fell from 0,46 to 0,29. Thus, as our research shows, Belarusian goods have become less competitive in the ROW markets just in those commodities for which the growth in the intensity of the trade with the CU countries has taken place. The reason for this, in our opinion, is in the trade barriers protecting producers from the competition from outside. The results of our analysis confirm the hypothesis about the appearance of diversion effect in trade in medium and hi-tech industrial commodities not only in Belarus but also in the CIS Customs Union as a whole.

4.2. Dynamic effects

The investigation attempts to determine how adherence to CIS Customs Union affects the creation of new and the improvement of existing Belarus' comparative advantages through the possibility to access diverse and modern technologies and production factors. In our study we use the approaches based on the analysis of the Belarus's comparative advantages relative to other members of RIAs, and relative to the rest of the world across selected group of 203 medium and hi-tech commodities. Drawing attention to comparative advantage is important for the reason that in the case of CIS and other transition economies transformation of industrial structure that was inherited from centrally-planed times appears to be especially crucial, in its turn, export diversification is one of the indicators of restructuring and production efficiency growth. (Aturupane, Djankov, Hoekman, 1997). Examining how comparative advantages are changed we look at the restructuring and production efficiency growth that allows to highlight the issue of dynamic effects of RIAs in CIS.

In our research we planned to use the data for pre-integration years (e.g. 1992-1994) as the starting point for the analysis of the trends. However, as the data (in the commodity codes) for this year are not available both in the Ministry of Statistics and Analysis and the UN Comtrade database, all the comparisons are made with year 1995 (the year of the formation of the Customs Union).

For the quantitative estimation of factors determining the RCA coefficient, the regression models are used. The research is conducted in two directions: cross-sectional analysis of the impact of the selected predictive indicators on the RCA coefficients for the 203 medium and hi-tech commodities; within the analysis of time series, the estimation of the impact of explanatory

variables on the change in the RCA coefficient for the group of the above mentioned commodities.

The explanatory variables are divided into two groups, the first of which is associated with the general factors determining the changes in the comparative advantages; the second one is associated with Belarus' participation in the Customs Union.

For the case of cross-sectional analysis, the following independent variables are used:

- Describing the possibility of obtaining new technology and know-how, the transmission of new knowledge: the share of imports of hi-tech products from the Customs Union in the total imports **(**Sh_Im_CU(t,i)), the share of imports of hi-tech products from the rest of the world in the total imports **(**Sh_Im_ROW(t,i**))**, intensity of the exchange of a given commodity within the CU **(**Int_CU(t,i**))** or the level of intra-industry trade, intensity of the exchange of the given commodity with the ROW countries (Int_CU(t,i)).
- Describing the effects of Belarus' participation in the CU: regional orientation index* (RO(t,i)), the share of the trade with the CU countries in the total volume of trade for the group of medium and high-tech commodities Sh_CU_Tr(t,i)**)**, the share of the trade with the ROW countries in the total volume of trade for the group of medium and high-tech commodities Sh_ROW_Tr(t,i)). As a resulting variable, the RCA coefficients** calculated for each commodity separately for CU countries and ROW countries were used.

In the general form, the regression model was represented by the following equations:

$$RCA\_CU(t,i) = a + b_1 \cdot Sh\_Im\_CU(t,i) + b_2 \cdot Sh\_Im\_ROW(t,i) + b_3 \cdot Int\_CU(t,i) + \\ + b_4 \cdot Int\_ROW(t,i) + b_5 \cdot RO(t,i) + b_6 \cdot Sh\_CU\_Tr(t,i) + b_7 \cdot Sh\_ROW\_Tr(t,i) + \varepsilon(t,i) \quad (5)$$

* beginning from year 1997, the change in the given coefficient (the value in the current year minus the value in the previous year) was used as the independent variable in the regression equations.

** formulas for computation of dependent and explanatory variables can be found in appendix C.

$$RCA\_ROW(t,i) = a + b_1 \cdot Sh\_Im\_CU(t,i) + b_2 \cdot Sh\_Im\_ROW(t,i) + b_3 \cdot Int\_CU(t,i) + \\ + b_4 \cdot Int\_ROW(t,i) + b_5 \cdot RO(t,i) + b_6 \cdot Sh\_CU\_Tr(t,i) + b_7 \cdot Sh\_ROW\_Tr(t,i) + \varepsilon(t,i) \quad (6)$$

The regression coefficients $a, b_1, \ldots, b_7$ depend on period t and they are different for equation (5) and equation (6); $\varepsilon(t,i)$ -- error.

The results of the estimation of these models are in tables D1 and D2. For the analysis of the regressors, their statistical significance and impact on the resulting indicator, year 1995 was taken as a benchmark for comparison.

In the regression equation for RCA_{CU}, the impact of the factors describing indirectly Belarus' participation in the regional trade agreement shows itself in the following way:

While in year 1996 the indicator of the share of trade with the CU countries (Sh_CU_Tr(t,i)) was statistically insignificant, beginning from year 1997 it has become significant, positively correlated and having high values of the regression coefficient, which is related to the reorientation of trade flow towards the regional block. At the same time, the tendency to the increase in the value of this coefficient, indicated in years 1997 – 1999, changed to the fall in year 2000. In other words, while in year 1999 the growth by 1point in the share of trade with the CU countries led the growth of the RCA coefficient for the countries of this trade block by 17,6 points, in year 2000 -- by 6,2 points. At the same time, the share of trade with the rest of the world (Sh_ROW_Tr(t,i)) lost its significance, which it had in years 1996 and 1997 (with the coefficient equal to 15,4 and 14,8 respectively), and in years 1999 – 2000 it took the negative sign. A similar tendency can be noticed also for the share of imports for medium and high-tech industrial products from the ROW countries (Sh_Im_ROW(t,i)). Positive and sufficient linkages experienced between above index and RCA_{CU} in 1995-1996 years altered to negative ones from year 1998. Moreover this negative relation intensified, the evidence of that was an increase in the regression coefficient from -39,4 to -67,9 over the period 1998-2000.

Whereas, in the scientific literature it has been theoretically and empirically proven that a high share of imports from the ROW countries should lead to the production efficiency growth, and, consequently, contribute to the improvement of the RCA index, because it is a source of new knowledge, know-how etc. If one follows such logic, then the sign at these variables should be positive. The appearance of the negative sign beginning from years 1998 -1999 in our case may be associated with the rise in the tariffs, as a result of which, the use of the parts and equipment imported from outside of the regional block leads to the price growth, and consequently lowers its competitive ability in the CU markets. This conjecture is confirmed also by the fact that the share of imports of medium and high-tech products from the CU countries (Sh_Im_CU(t,i)) has the most significant impact on the RCA for this geographical direction, and the value of the regression coefficient at this variable has an explicit tendency to the increase, i.e. beginning from 1997 the substitution of suppliers from outside of the trade block for intra-regional ones has occurred. Hence the impact of such a factor as the change in regional orientation of exports on the resulting indicator is quite interesting. This factor is characterized by the consistent decrease in the regression coefficient, which in year 2000 changed its sign for negative and became insignificant, i.e. the strengthening of the orientation towards the CU markets leads to the loss of competitive ability in these markets. Thus, the estimation results confirm our hypothesis that Belarus' participation in the Customs Union does not improve the export structure and existing revealed comparative advantages, and it neither contributes to the formation of new ones in the trade with the countries of this regional trade agreement.

The next, probably even more important task, was the estimation of the factors affecting the RCA coefficient calculated for the rest of the world, because, as it was mentioned above, this indicator reflects the real competitive ability of Belarusian goods, i.e. how much they meet the requirements put in the markets not protected by preferential trade agreements.

From the results of estimation of regression equation (6), it follows that the change in RCA_{ROW} was affected mainly by the four factors: share of imports of medium and high-tech industrial products from the ROW countries (Sh_Im_ROW(t,i)), intensity of exchange of these products with the ROW countries (Int_ROW(t,i)) , the change in the regional trade orientation index (RO(t,i)), the specific weight of the ROW countries in the total volume of trade (Sh_ROW_Tr(t,i).

The indicator of the share of high-tech imports from the ROW countries (Sh_Im_CU(t,i)) was negative during practically all the analyzed period, however it was significant only in years 1998 and 1999. In this case the inverse dependence (i.e. the higher the share of imports from the trade block is the worse the revealed comparative advantages are in the markets of non-member countries) is quite natural, because by the qualitative and technical characteristics the parts, capital equipment, etc. from the Customs Union as a rule are inferior to analogues coming from the rest of the world. In favor of that witnessed the fact that the share of extra-union import of medium and high-tech products Sh_Im_ROW(t,i)) as well as intensity of exchange of these products with rest of the world countries (Int_ROW(t,i)) had a positive impact on RCA_{ROW} confirming the importance of this geographical direction for improving competitiveness and hence the efficiency of production of medium and high-tech goods.

The factors characterizing the effects of Belarus' participation in the Customs Union influence RCA_{ROW} in the following way: The share of trade with the ROW countries (Sh_ROW_Tr(t,i) has the positive sign and is characterized by high elasticity coefficients. For example, while in year 1999 its growth by one point led to the growth of the RCA index by 21 points, in year 1999 – by 39 points (in year 2000 the value of the regression coefficient was lower: 11,0). The change in the regional orientation index (RO (t,i)) has the negative sign, i.e. the consequence of the increase in the export orientation towards the CU countries is the

deterioration of the comparative advantages in the ROW markets. It is in line with our previous results obtained while using Yeats techniques. The share of trade with the CU countries (Sh_CU_Tr(t,i)) is insignificant and in 1998-1999 negative.

The results of the estimation of equation (6) conform to our hypothesis about negative impact of Belarus' participation in the CIS Customs Union on the revealed comparative advantages in the group of medium and high-tech commodities for the ROW countries. Thus, this hypothesis has proven to be true both for the trade within the regional block and for the trade outside of it.

From the conducted analysis it follows that there exist two time periods (this is especially characteristic for the trade with the CU countries): years 1995 - 1997 representing "transition period" and years 1998 - 2000 when the effects of the participation in this regional trade agreement became stronger. In connection with it, the next stage of our analysis was the estimation of the impact of the factors relating to the policy of regional integration and transmission of new knowledge, technology, know-how on the change in the revealed comparative advantages in the group of the 203 medium and high-tech industrial products. For our analysis, we use monthly data of the trade statistics over years 1998 - 2000.

As independent variables* characterizing the possibility of obtaining new technology, knowledge, know-how etc., we used: the share of high-tech imports from the CU countries Sh_CU_Hi(t) (ROW countries Sh_ROW_Hi(t)) in the total volume of imports with the lags in one, two and three months, as well as Grubel-Lloyd coefficients (GL_CU(t); GL_ROW(t)) reflecting the level of intra-industry trade and calculated for each of the mentioned above geographical directions. The impact of the participation in the Customs Union on the resulting indicator is estimated with the help of the following explanatory variables: regional orientation index RO(t), change in regional orientation index dRO(t), intensity of trade with the countries of

* For technique of computing of the independent variables see appendix C

the regional trade block Int_TR_Hi(t), share of trade with the CU countries Sh_Tr_Cu(t), and dummy describing the change in tariffs Dum(t).

For dependent variables, we calculate the RCA indices for the trade with the CU and ROW countries for the group of the selected industrial medium and hi-tech products.

The regression equations are as follows:

$$RCA\_CU(t) = a + b1Sh\_CU\_Hi(-2) + b2Sh\_ROW\_Hi(-2) + b3GL\_CU(t) + b4GL\_ROW(t) + b5RO(t) + b6dRO(t) + b7Sh\_Tr\_CU(t) + b8Int\_Tr\_Hi(t) + b9Dum(t) + \varepsilon(t) \quad (7)$$

$$RCA\_ROW(t) = a + b1Sh\_CU\_Hi(-3) + b2Sh\_ROW\_Hi(-2) + b3Sh\_ROW\_Hi(-3) + b4GL\_CU(t) + b5GL\_ROW(t) + b6dRO(t) + b7Sh\_Tr\_CU(t) + b8Int\_Tr\_Hi(t) + b9Dum(t) + \varepsilon(t) \quad (8)$$

The results of the estimation of our regression models are in Table D3 (Appendix D). For the trade within the Customs Union, statistically significant regressors are the share of imports of high-tech commodities from trade block Sh_CU_Hi(t) and both of the Grubel-Lloyd coefficients (GL_CU(t); GL_ROW(t)). It should be noticed that two former indices have negative sign, i.e. the increment in trade with CIS Customs Union and enhancement of intra-industry trade with member states influence negatively RCA_CU in the group of medium and high-tech industrial commodities, whereas strengthening of the intra-industry trade with the rest of the world lead to improvement of that index**.** This result could mean that protective trade barriers allow Belarusian firms to compete in the markets of CU member countries (with Russia in the first place). At the same time the rise of intra-industry trade, that involves exchanges of similar goods within this regional agreement does not facilitate the changes in the composition of exports and improvement of revealed comparative advantage due to the fact that enterprises do not obtain access to know-how and technologies since best-practice production techniques, quality

standards of medium-and hi-tech products in the global economy are different from those in CU countries.

The influence of the indicators characterizing the impact of participation in the RIAs under consideration developed in the following way: the share of trade with the CU countries Sh_Tr_Cu(t) is significant and has the positive sign, while index of regional orientation (RO(t)) and change of index of regional orientation (dRO(t)) negatively influenced the revealed comparative advantages of commodities supplied to the given markets, however only the latter indicator is statistically significant. Such correlation between change of regional orientation and RCA_CU can be explained as follows: being aware that CU markets are shielded by preferential trade arrangement, Belarusian producers increase the exports towards this direction (including barter schemes), but their "real" competitiveness (ability to compete in third countries) is rather low. However, the greater quality, design and technologic requirements of regional consumers are, the less Belarusian products meet them. As a result index of regional orientation of export negatively associates with revealed comparative advantage in CU markets.

As we noted above, the point of special interest is an analysis of the influence of independent variables on competitiveness of Belarusian products outside the preferential agreement. The results of estimation equation (8) reveal among the statistically significant along with variables reflecting the influence of policy of regional orientation such regressors as the share of import medium-and hi-tech products from the CU countries with three month lag (direction of influence is negative) and share of import of the above group of products from the rest of the world with two and three month lag (the effect is positive). These results conform to the dynamic effects hypothesis. As the interpretation of the impact of last two parameters was considered while explaining regression models (5)-(6), we turn to influence of the proxies of regional integration on RCA_{ROW}. Among statistically significant we have found all of them excluding the tariff

dummy. The coefficient for the variable Sh_Tr_CU has a negative sign, indicating that 1 point increase in the share of trade with CU counties leads to a decrease of comparative advantage by 1,7 points. In its turn, the negative relationship is observed between RCA_{Row} and intensity of trade index. However, the elasticity of that factor is not high. The analysis of its influence on revealed comparative advantage is rather interesting from viewpoint of not only dynamic but static trade effects as well. This parameter can provide additional insights whether countries trade in conformance with their shares in global trade. If trade intensity index takes on the value above (below) unity, the countries trade more (less) than it can be expected taking into consideration partners share in global trade. In the case of CU countries, this index takes the magnitude 25 -27 in the period under review. The question is whether such a high value corresponds to the efficiency and real comparative advantages i.e. those that traded goods have in the markets of the rest of the world. The negative sign of this factor testifies the reverse relations, which confirm dynamic effect hypotheses. At the same time it implies the existence of trade diversion effects, since partner countries can afford to trade in goods, which have costs higher, compared to the rest of the world only if they are shielded by preferential trade arrangement. Thus all statistically significant variables have the signs that were predicted by our hypotheses with exception of changes of regional orientation regressor, which have turned out to be positive. This fact is difficult to interpret substantively but as in the case of model (5) the sign is "correct", i.e. corresponds to the suggested hypotheses. It possibly can be explained by the fact that RO index is computed using data for whole exports, and it turns out to be poorly correlated with the volumes of medium-and hi-tech products exported to the rest of the world over the given period of time.

5. Conclusions

The analysis of the economic effects of Belarus participation in the CIS countries CU for 1995 - 2000 has shown that prevalence of trade diversion effect and hence welfare losses were experienced in chemistry and petrochemistry, light, wood and wood-proceeding, machine-building and metal-working industries. Moreover for the latter from the above mentioned industries this predominance was the most considerable (amount to 30-40% of given industries according to Truman's methodology) and most alarming since this industry plays a key role in the Belarusian economy and produces overwhelming majority group of medium- and hi-tech goods (according to OECD classification).

After joining this regional trade arrangement the country tends to be less competitive in the markets of the rest of the world in products where trade increased and reoriented towards the CU. The reasons of it are, from our viewpoint, trade barriers that give Belarusian firms preferential access to partner markets and protect them from outside competition. This confirms to the initial hypothesis about the presence of trade diversion effect in the trade in medium- and high-tech products due to the substantial changes (reorientation) in the direction of trade flows towards member countries that accompanied the formation of the CIS countries CU.

The quantitative estimations of the factors determining the changes of revealed comparative advantage and therefore competitiveness and efficiency of production are carried out on the basis of regression models including two sets of explaining variables: reflecting possibility of technology, knowledge transfer and reflecting regional integration. The analysis provides support for the hypothesis that CIS countries CU membership did not facilitate the attraction of modern technologies and production factors to the economy, the increase in the investments into the human and physical capital, and, consequently, the improvement in the domestic exports structure, the formation of the new comparative advantages.

Based on the examination of o the impact of variables characterizing the implication of Belarus' participation in CU for the change of revealed comparative advantage the findings of this study appear to constitute convincing proof that the country was not internationally competitive in medium and high-tech goods were intra-trade was growing rapidly. Moreover the increase in the index of regional orientation of exports as well as intensity and share of trade with member countries have led to disadvantage not only in trade with the rest of the world where Belarusian goods are not shielded by preferential trade arrangement but also in some cases in RIA partners markets.

The paper provides some evidence that factors determining the possibility of technology transfer, obtaining access to know-how, i.e. the share of imports medium- and hi-tech products from the rest of the world positively correlated with competitiveness in the markets of the third countries. However restrictive CU trade barriers discriminate against third countries' exports to Belarus in favor of partner country suppliers.

All above facts testify the crucial need for the foreign trade policy adjustment in the field of regional integration and for the elaboration of the alternative approaches with regard to the participation in RIAs. In addition to trade arrangement a new investment regime should be established to promote and protect investment including a significant liberalization of the rules for technology transfer, exports and imports, financial transactions, and other areas that affect the foreign investment climate

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Appendix A

Let us prove that as the price rises $\pi_1'' = \pi_1''(P)$ falls quicker than $\pi_1' = \pi_1'(P)$ does.

Assume that the revenue function $R(q)$ is strictly concave and $\lim\limits_{R\to\infty} \dfrac{dR}{dq} = 0$. Then the profit maximization problems:

$$\pi_1 = R(q) - P \cdot q \to \max, \tag{A.1}$$

$$0 \le q \le \infty, \tag{A.2}$$

and

$$\pi_1 = R(q) - P \cdot q \to \max, \tag{A.3}$$

$$q \ge 0, \tag{A.4}$$

have optimal solutions q' and q'', and these solutions are unique.

Note that

$$q' \le q'', \tag{A.5}$$

and if $q' = q''$, then $q' = q'' = 0$.

The case when $q' = q'' = 0$ can happen only for one value of the price P. (It follows from the strict concavity of $R(q)$.) Let P_0 denote this value of the price.

Thus

$$q' < q'' \tag{A.6}$$

if $P \ne P_0$;

$$q' = q'' = 0 \tag{A.7}$$

if $P = P_0$.

Differentiating $\pi_1' = \pi_1'(P)$ and $\pi_1'' = \pi_1''(P)$, we get

$$\frac{d}{dP}\pi_1'(P) = -q', \tag{A.8}$$

$$\frac{d}{dP}\pi_1''(P) = -q''. \tag{A.9}$$

From (A.6) – (A.9) it follows that

$$\frac{d}{dP}\pi_1'(P) > \frac{d}{dP}\pi_1''(P) \tag{A.10}$$

if $P \neq P^e$;

$$\frac{d}{dP}\pi_1'(P) = \frac{d}{dP}\pi_1''(P) \tag{A.11}$$

if $P = P^e$.

Consequently, as the price rises $\pi_1'' = \pi_1''(P)$ falls quicker than $\pi_1' = \pi_1'(P)$ does.

Appendix B

Table B1. Foreign Trade of Eurasian Economic Community in 1997, 1999. (%)

	Exports				Imports			
	Eurasian Economic Community		Rest of the World		Eurasian Economic Community		Rest of the World	
	1997	1999	1997	1999	1997	1999	1997	1999
Belarus	46,2* 66,7	60,2 53,0**	53,8* 33,3	39,8 47,0**	46,0* 54,7	56,9 66,0**	54,0* 45,3	43,1 36,0**
Russia	10,7	8,5	89,3	91,5	14,4	15,5	85,6	84,5
Kazakhstan	37,4	21,7	62,6	78,3	49,0	38,5	51,0	61,5
Kyrgyzstan	18,5	28,0	81,5	72,0	39,7	31,9	60,3	68,1
Tajikistan	25,1	18,2	74,9	81,80	22,1	27,4	77,9	72,6
Total Eurasian EC	16,6	13,1	83,4	86,9	22,1	24,3	77,9	75,7

Souces: Statistical Yearbook "Commonwealth of Independent States, 2000 г", "Foreign Trade of the Republic of Belarus, 2000 ", authors' calculations
* data for 1995 .
** data for 2000.

Table B2. Eurasian Economic Community countries exports as a share of total CIS exports in 1997,1999

Exporter	Belarus	Russia	Kazakhstan	Kyrgyzstan	Tajikistan	Rest CIS countries
Belarus						
1995	--	71.3	2,6	0,2	0,2	25,7
1997		88,9	1,5	0,1	0,1	9,4
1999		89,0	0,8	0,2	0,1	9,9
2000		85,0	0,5	0,1	0,1	14,3
Russia						
1997	27,9	-	14,9	1,0	0,5	55,7
1999	34,8	-	11,3	0,8	0,6	42,5
Kazakhstan						
1997	1,5	75,7	-	2,3	1,9	18,9
1999	0,8	75,8	-	4,1	3,2	17,1
Kyrgyzstan						
1997	2,7	30,9	27,3	-	4,0	35,1
1999	2,7	38,6	24,5	-	5,2	29,0
Tajikictan						
1997	1,1	23,2	3,7	3,3	-	68,7
1999	1,0	36,5	1,1	1,2	-	60,2

Sources: Statistical Yearbook "Commonwealth of Independent States, 2000 г", "Foreign Trade of the Republic of Belarus, 2000 ", authors' calculations

Table B3. Eurasian Economic Community countries imports as a share of total CIS imports in 1997,1999

Importer	Belarus	Russia	Kazakhstan	Kyrgyzstan	Tajikistan	Rest of CIS countries
Belarus						
1995	-	80,6	1,5	0,1	0,1	17,7
1997	-	80,4	1,0	0,2	0,1	18,3
1999		87,8	0,3	0,3	0,1	11,5
2000		92,2	0,8	0,2	0,1	6,7
Russia						
1997	32,8	-	19,6	1,1	0,7	45,8
1999	37,4	-	16,2	1,1	1,3	44,0
Kazakhstan						
1997	2,5	85,2	-	2,4	0,3	9,6
1999	2,4	84,7	-	1,7	0,1	11,1
Kyrgyzstan						
1997	2,4	43,8	16,0	-	2,3	35,5
1999	2,0	42,2	28,0	-	1,6	26,2
Tajikistan						
1997	0,7	23,9	8,7	1,1	-	65,6
1999	0,6	18,0	15,3	1,4	-	64,7

Sources: Statistical Yearbook "Commonwealth of Independent States, 2000 г", "Foreign Trade of the Republic of Belarus, 2000 ", authors' calculations

Table B4. Apparent consumption Accounted for by Three Sources (percentages)

	All manufactures			Electric power industry			Chemical petrochemical industry			Machine-building Metal-working industry			Wood and wood-proceeding industry			Light industry		
	Domestic consumption	Imp. Rest of the world	Imp. Custom Union	Domestic consumption	Imp. Rest of the world	Imp. Custom Union	Domestic consumption	Imp. Rest of the world	Imp. Custom Union	Domestic consumption	Imp. Rest of the world	Imp. Custom Union	Domestic consumption	Imp. Rest of the world	Imp. Custom Union	Domestic consumption	Imp. Rest of the world	Imp. Custom Union
1993	62,30	15,68	22,02	95,52	0,00	4,48	25,95	41,46	32,58	62,32	20,99	16,69	80,52	10,18	9,30	83,71	9,82	6,47
1994	59,89	12,38	27,73	96,84	0,00	3,16	36,13	37,65	26,22	58,19	25,97	15,85	73,60	14,70	11,70	76,93	15,04	8,03
1995	59,21	13,49	27,30	93,73	1,34	4,93	26,24	32,84	40,92	53,65	29,11	17,23	72,93	15,86	11,21	77,06	16,38	6,56
1996	58,77	13,40	27,83	90,70	3,15	6,15	30,79	31,39	37,82	63,30	20,56	16,14	73,40	12,59	14,00	73,63	17,78	8,59
1997	52,67	15,23	32,10	91,97	2,30	5,73	48,50	24,03	27,47	52,08	21,51	26,41	84,43	3,56	12,01	52,21	26,71	21,08
1998	52,10	13,24	34,66	85,68	5,57	8,75	28,76	24,22	47,02	48,79	22,30	28,91	68,47	10,87	20,65	68,61	18,47	12,92
1999	56,30	12,51	31,18	89,88	1,55	8,57	41,94	21,69	36,36	23,70	22,36	53,94	69,58	9,42	21,01	72,16	16,03	11,81

*** Sources authors calculations based on the data from Ministry of Statistics and Analysis of the Republic of Belarus**

Table B5. Estimated Trade Creation and Trade Diversion Effects in Belarus' manufacturing

	Trade Diversion		Trade Creation	
	Bel Ruble mln.	In % of imports	Bel. Rubl mln.	In % of imports
Electric power Industry	**-6779,5**	**-13,8**	**8273,3**	**16,9**
Petroleum Industry	-	-	**0,0**	-
Gas Industry	-	-		-
Mining industry	**-552,4**	**-5,8**	**1881,7**	**19,7**
other fuel industry	**0,6**	-	**-1174,3**	-
Ferrous metals	**111235,3**	**60,3**	**45461,9**	**24,7**
Non-ferrous metals	**440492,6**	**1295,5**	**3701424,5**	**10885,9**
Chemical and petrochemical industry	**-9703,5**	**-4,3**	**-81208,5**	**-36,1**
Machine-building and metal-working industry	**-89707,1**	**-30,6**	**-15266,1**	**-5,2**
Wood and wood-proceeding industry	**-27130,4**	**-43,6**	**-11792,8**	**-18,9**
Construction materials industry	**-3696,1**	**-13,7**	**8096,2**	**30,0**
Light Industry	**-19795,7**	**-29,5**	**-7410,5**	**-11,0**
Food Industry	**6038,0**	**7,5**	**-11131,1**	**-13,8**
Other manufactures	**-4427,4**	**-41,1**	**18871,4**	**17,2**
All manufactures	**56678,7**	**3,8**	**-26886,3**	**-1,8**

* authors calculations based on the data from Ministry of Statistics and Analysis of the Republic of Belarus

Table B6. Revealed Comparative Advantage and Regional Orientation of Trade

Commodity (four-digit level SITC)	Regional Orientation index (RO)		Revealed Comparative Advantage index (RCA)		RO Index Change	RCA Index Change
	1996	2000	1996	2000		
8401	0,000	0,000	0,000	0,500	0,000	0,500
8402	0,542	2,357	0,068	0,011	1,815	-0,057
8403	6,955	13,722	0,104	0,033	6,768	-0,071
8404	0,092	0,842	0,794	0,667	0,750	-0,127
8405	0,000	0,000	0,266	0,000	0,000	-0,266
8406	0,000	0,000	0,000	0,000	0,000	0,000
8407	0,071	3,850	0,853	0,196	3,779	-0,657
8408	0,535	4,625	0,731	0,248	4,090	-0,483
8409	0,689	7,371	0,279	0,176	6,682	-0,102
8410	0,000	0,000	0,041	0,000	0,000	-0,041
8411	0,009	0,002	0,947	0,980	-0,007	0,033
8412	0,144	0,583	0,385	0,437	0,439	0,052
8413	2,803	3,107	0,237	0,225	0,304	-0,013
8414	1,496	14,754	0,320	0,150	13,258	-0,169
8415	20,605	9,474	0,007	0,006	-11,130	-0,001
8416	1,580	4,763	0,503	0,104	3,183	-0,399
8417	4,049	22,797	0,012	0,001	18,748	-0,012
8418	6,169	2,557	0,618	0,885	-3,612	0,266
8419	2,242	0,716	0,015	0,178	-1,526	0,164
8420	0,000	7,694	0,098	0,018	7,694	-0,081
8421	1,257	4,413	0,056	0,052	3,157	-0,004
8422	9,399	8,048	0,006	0,025	-1,350	0,019
8423	8,884	62,028	0,070	0,008	53,144	-0,062
8424	6,524	30,114	0,106	0,021	23,590	-0,085
8425	4,608	8,610	0,206	0,050	4,001	-0,157
8426	5,637	8,322	0,096	0,057	2,685	-0,039
8427	36,392	35,548	0,140	0,084	-0,844	-0,055
8428	5,387	7,142	0,332	0,087	1,755	-0,246
8429	1,233	3,158	0,727	0,710	1,925	-0,017
8430	0,812	5,452	0,101	0,005	4,640	-0,096
8431	0,830	6,950	0,109	0,214	6,120	0,105
8432	2,474	13,658	0,452	0,376	11,185	-0,077
8433	2,533	27,181	0,797	0,021	24,648	-0,776
8434	0,946	371,300	0,047	0,001	370,354	-0,047
8435	0,000	0,000	0,000	0,000	0,000	0,000
8436	7,591	19,116	0,193	0,008	11,525	-0,186
8437	0,853	1,929	0,104	0,052	1,076	-0,053
8438	5,792	21,881	0,038	0,017	16,089	-0,021
8439	0,000	0,000	0,000	0,000	0,000	0,000
8440	0,000	4,333	0,000	0,001	4,333	0,001
8441	0,018	0,000	0,012	0,000	-0,018	-0,012
8442	30,250	0,000	0,002	0,000	-30,250	-0,002
8443	0,031	0,879	0,004	0,002	0,848	-0,003

8444	0,155	0,000	0,003	0,000	-0,155	-0,003
8445	0,000	0,048	0,000	0,107	0,048	0,107
8446	0,000	0,000	0,769	0,003	0,000	-0,766
8447	1,580	0,877	0,036	0,035	-0,703	0,000
8448	0,424	1,845	0,056	0,007	1,421	-0,049
8449	0,000	0,000	0,500	0,000	0,000	-0,500
8450	4,030	255,208	0,102	0,002	251,178	-0,100
8451	0,001	23,639	0,068	0,001	23,638	-0,067
8452	1,419	11,805	0,281	0,035	10,386	-0,246
8453	0,000	0,000	0,032	0,000	0,000	-0,032
8454	0,588	0,000	0,063	0,000	-0,588	-0,063
8455	0,423	3,041	0,572	0,014	2,617	-0,558
8456	0,000	2,747	0,067	0,022	2,747	-0,045
8457	3,335	3,808	0,979	0,007	0,473	-0,972
8458	0,045	44,638	0,116	0,001	44,593	-0,115
8459	0,948	3,703	0,893	0,397	2,755	-0,496
8460	2,085	4,330	0,549	0,279	2,244	-0,270
8461	2,397	4,544	0,896	0,089	2,147	-0,807
8462	0,666	1,143	0,389	0,168	0,477	-0,221
8463	0,586	12,023	0,373	0,078	11,437	-0,295
8464	0,312	0,663	0,492	0,230	0,351	-0,262
8465	5,561	7,682	0,076	0,082	2,121	0,006
8466	2,100	6,529	0,479	0,176	4,430	-0,303
8467	8,370	3,245	0,006	0,021	-5,124	0,016
8468	0,771	47,722	0,084	0,044	46,951	-0,041
8469	0,000	0,000	0,002	0,000	0,000	-0,002
8470	3,079	957,600	0,148	0,000	954,521	-0,147
8471	3,559	6,528	0,091	0,016	2,969	-0,075
8472	0,430	396,500	0,060	0,000	396,070	-0,060
8473	6,710	3,837	0,007	0,015	-2,873	0,008
8474	2,489	6,646	0,287	0,049	4,157	-0,237
8475	0,000	0,016	0,050	0,780	0,016	0,730
8476	0,000	0,000	0,000	0,000	0,000	0,000
8477	0,015	1,546	0,009	0,009	1,531	0,000
8478	0,000	0,000	0,000	0,000	0,000	0,000
8479	1,338	2,032	0,062	0,125	0,694	0,063
8480	0,058	1,177	0,209	0,172	1,120	-0,037
8481	2,799	6,206	0,287	0,065	3,407	-0,222
8482	1,396	2,863	0,716	0,448	1,467	-0,268
8483	0,117	1,189	0,574	0,198	1,071	-0,376
8484	0,078	2,574	0,185	0,056	2,497	-0,130
8485	0,111	10,444	0,410	0,040	10,333	-0,370
8501	1,552	18,943	0,421	0,081	17,390	-0,340
8502	1,154	18,058	0,179	0,017	16,904	-0,162
8503	0,000	2,907	0,247	0,429	2,907	0,183
8504	2,768	13,487	0,377	0,101	10,719	-0,277
8505	0,677	2,295	0,268	0,192	1,618	-0,076
8506	0,000	187,778	0,010	0,000	187,778	-0,010
8507	0,065	16,681	0,038	0,009	16,616	-0,029
8508	2,989	40,921	0,169	0,015	37,932	-0,154

8509	24,237	64,944	0,053	0,040	40,707	-0,013
8510	0,000	0,000	0,000	0,000	0,000	0,000
8511	14,632	35,328	0,641	0,323	20,696	-0,318
8512	0,083	1,100	0,361	0,186	1,017	-0,175
8513	2,134	19,203	0,401	0,090	17,069	-0,311
8514	0,000	306,000	0,331	0,000	306,000	-0,331
8515	0,302	2,959	0,257	0,130	2,657	-0,126
8516	5,856	19,449	0,338	0,084	13,592	-0,254
8517	12,228	19,815	0,015	0,015	7,588	0,000
8518	0,061	11,822	0,058	0,014	11,761	-0,044
8519	4,800	0,000	0,005	0,000	-4,800	-0,005
8520	66,881	54,118	0,017	0,007	-12,763	-0,011
8521	17,667	0,000	0,000	0,000	-17,667	0,000
8522	0,000	0,667	0,000	0,004	0,667	0,004
8523	1,500	0,322	0,003	0,030	-1,178	0,027
8524	0,035	0,038	0,502	0,426	0,004	-0,076
8525	3,847	2,448	0,258	0,027	-1,399	-0,231
8526	0,010	0,114	0,888	0,667	0,104	-0,221
8527	3,325	85,213	0,576	0,002	81,887	-0,574
8528	16,904	61,740	0,117	0,200	44,836	0,083
8529	0,747	0,914	0,142	0,147	0,166	0,005
8530	0,021	7,574	0,802	0,220	7,553	-0,582
8531	30,075	40,747	0,093	0,027	10,672	-0,066
8532	5,850	10,566	0,211	0,098	4,717	-0,113
8533	1,944	2,391	0,200	0,023	0,447	-0,178
8534	11,671	1160,909	0,339	0,002	1149,238	-0,336
8535	0,436	7,762	0,157	0,024	7,326	-0,133
8536	3,826	18,375	0,282	0,057	14,549	-0,225
8537	4,618	30,108	0,171	0,028	25,491	-0,143
8538	72,947	2,024	0,014	0,071	-70,923	0,057
8539	1,368	7,508	0,775	0,244	6,140	-0,531
8540	0,837	0,118	0,056	0,030	-0,719	-0,026
8541	0,997	0,630	0,901	0,578	-0,366	-0,323
8542	0,245	0,826	0,750	0,577	0,580	-0,172
8543	5,390	3,295	0,166	0,021	-2,096	-0,145
8544	1,179	10,651	0,258	0,145	9,472	-0,113
8545	0,001	3,444	0,018	0,000	3,444	-0,018
8546	0,000	1,141	0,079	0,260	1,141	0,181
8547	1,550	58,500	0,057	0,002	56,950	-0,054
8548	0,141	0,261	0,363	0,928	0,120	0,564
8601	0,000	0,000	0,500	0,500	0,000	0,000
8602	0,000	0,000	1,000	0,500	0,000	-0,500
8603	0,000	0,000	0,000	0,500	0,000	0,500
8604	0,000	0,000	0,000	0,000	0,000	0,000
8605	0,000	0,000	0,010	0,500	0,000	0,490
8606	0,000	0,000	0,457	0,000	0,000	-0,457
8607	0,264	4,592	0,230	0,100	4,328	-0,130
8608	9,933	17,484	0,430	0,028	7,551	-0,403
8609	0,000	0,000	0,320	0,566	0,000	0,246
8701	0,392	1,857	0,989	0,691	1,466	-0,299

8702	9,290	143,167	0,035	0,038	133,877	0,003
8703	2,972	29,494	0,099	0,037	26,521	-0,062
8704	3,651	7,201	0,930	0,769	3,551	-0,161
8705	1,656	1,176	0,317	0,806	-0,479	0,488
8706	0,129	216,665	0,955	1,000	216,536	0,045
8707	0,000	3,115	0,412	0,171	3,115	-0,241
8708	1,309	4,465	0,586	0,423	3,156	-0,163
8709	31,901	421,807	0,330	0,230	389,906	-0,099
8710	0,000	0,000	0,500	0,500	0,000	0,000
8711	0,175	0,061	0,998	0,999	-0,114	0,001
8712	2,367	20,471	0,990	0,850	18,105	-0,140
8713	0,000	0,000	0,000	0,000	0,000	0,000
8714	0,153	7,512	0,599	0,396	7,358	-0,203
8715	0,529	153,400	0,218	0,011	152,871	-0,207
8716	2,889	5,163	0,574	0,297	2,273	-0,278
8802	0,000	0,000	0,993	0,500	0,000	-0,493
8803	0,000	0,000	0,953	0,500	0,000	-0,453
8804	0,020	0,000	0,758	0,500	-0,020	-0,258
8805	0,000	0,000	1,000	0,500	0,000	-0,500
8901	0,000	0,000	0,994	1,000	0,000	0,006
8903	0,000	0,000	0,989	0,000	0,000	-0,989
8904	0,583	0,000	1,000	1,000	-0,583	0,000
8905	0,090	0,000	0,500	0,000	-0,090	-0,500
8906	0,000	0,000	0,500	0,500	0,000	0,000
8907	0,000	0,000	0,500	1,000	0,000	0,500
8908	0,000	0,000	0,500	0,500	0,000	0,000
9001	2,906	1,542	0,184	0,264	-1,364	0,079
9002	0,828	0,624	0,882	0,830	-0,204	-0,053
9003	0,000	1,351	0,028	0,032	1,351	0,004
9004	0,000	0,009	0,967	0,942	0,009	-0,026
9005	0,934	0,668	0,994	0,990	-0,265	-0,005
9006	0,371	0,502	0,565	0,107	0,131	-0,458
9007	0,000	0,000	0,000	0,000	0,000	0,000
9008	0,225	0,805	0,780	0,398	0,580	-0,382
9009	1,375	7,425	0,012	0,013	6,049	0,001
9010	0,002	0,063	0,666	0,056	0,061	-0,609
9011	0,019	0,018	0,658	0,883	-0,001	0,225
9012	0,000	0,000	0,000	0,674	0,000	0,674
9013	0,260	0,226	0,972	0,707	-0,034	-0,265
9014	6,001	22,994	1,000	0,999	16,993	-0,001
9015	0,724	0,769	0,407	0,064	0,045	-0,343
9016	0,250	36,692	0,012	0,006	36,442	-0,007
9017	0,752	8,614	0,209	0,073	7,862	-0,137
9018	0,021	0,251	0,483	0,395	0,229	-0,089
9019	0,383	1903,000	0,010	0,000	1902,617	-0,010
9020	0,000	2,209	0,000	0,122	2,209	0,122
9021	0,000	1,283	0,013	0,063	1,283	0,050
9022	0,000	8,172	0,000	0,032	8,172	0,032
9023	0,438	38,857	0,437	0,097	38,419	-0,340
9024	0,000	0,742	0,002	0,206	0,742	0,203

9025	0,026	5,456	0,140	0,061	5,430	-0,079
9026	0,791	6,139	0,060	0,077	5,348	0,016
9027	2,830	4,207	0,048	0,091	1,377	0,042
9028	2,033	85,439	0,067	0,043	83,406	-0,024
9029	0,809	5,473	0,230	0,052	4,664	-0,178
9030	2,433	0,513	0,345	0,789	-1,920	0,443
9031	1,310	2,209	0,453	0,122	0,900	-0,331
9032	0,014	3,184	0,301	0,037	3,170	-0,264
9033	0,000	0,221	0,115	0,113	0,221	-0,002
Total	**1,558**	**3,410**	**0,459**	**0,285**	**1,852**	**-0,174**

AppendixC.

Formulas for computation dependent and independent variables

Equations (5)-(6):

$$RCA\_CU(t,i)=\begin{cases}\dfrac{Ex\_CU(t,i)\div Im\_CU(t,i)}{[Ex\_CU(t,i)\div Im\_CU(t,i)]+[Ex\_CU(t)\div Im\_CU(t)]} \\ \text{if}\quad Im\_CU(t,i)\neq 0, \\ 0.5\quad \text{if}\ Im\_CU(t,i)=0\ \text{and}\ Ex\_CU(t,i)=0, \\ 1\quad \text{if}\ Im\_CU(t,i)=0\ \text{and}\ Ex\_CU(t,i)\neq 0.\end{cases}$$

$$RCA\_ROW(t,i)=\begin{cases}\dfrac{Ex\_ROW(t,i)\div Im\_ROW(t,i)}{[Ex\_ROW(t,i)\div Im\_ROW(t,i)]+[Ex\_ROW(t)\div Im\_ROW(t)]} \\ \text{if}\quad Im\_ROW(t,i)\neq 0, \\ 0.5\quad \text{if}\ Im\_ROW(t,i)=0\ \text{and}\ Ex\_ROW(t,i)=0, \\ 1\quad \text{if}\ Im\_ROW(t,i)=0\ \text{and}\ Ex\_ROW(t,i)\neq 0.\end{cases}$$

$$Sh\_Im\_CU(t,i)=\frac{Im\_CU\_Hi(t)-Im\_CU(t,i)}{Im(t)}$$

$$Sh\_Im\_ROW(t,i)=\frac{Im\_ROW\_Hi(t)-Im\_ROW(t,i)}{Im(t)}$$

$$Int\_CU(t,i)=\begin{cases}1-\dfrac{|Ex\_CU(t,i)-Im\_CU(t,i)|}{Ex\_CU(t,i)+Im\_CU(t,i)} & \text{if } Ex\_CU(t,i)+Im\_CU(t,i)\neq 0\\ 1 \text{ if } Ex\_CU(t,i)+Im\_CU(t,i)=0\end{cases}$$

$$Int\_ROW(t,i)=\begin{cases}1-\dfrac{|Ex\_ROW(t,i)-Im\_ROW(t,i)|}{Ex\_ROW(t,i)+Im\_ROW(t,i)} & \text{if } Ex\_ROW(t,i)+Im\_ROW(t,i)\neq 0\\ 1 \text{ if } Ex\_ROW(t,i)+Im\_ROW(t,i)=0\end{cases}$$

$$RO(i,t)=\begin{cases}\dfrac{Ex\_CU(t,i)}{Ex\_CU(t,i)+Ex\_ROW(t,i)} & \text{if } Ex\_CU(t,i)+Ex\_ROW(t,i)\neq 0\\ 0.5 \text{ if } Ex\_CU(t,i)+Ex\_ROW(t,i)=0\end{cases}$$

$$Sh\_CU\_Tr(t,i)=\frac{Ex\_CU(t,i)+Im\_CU(t,i)}{Ex\_Hi(t)+Im\_Hi(t)}$$

$$Sh\_ROW\_Tr(t,i)=\frac{Ex\_ROW(t,i)+Im\_ROW(t,i)}{Ex\_Hi(t)+Im\_Hi(t)}$$

Equations (7)-(8):

$$Sh\_CU\_Hi(t)=\frac{Im\_CU\_Hi(t)}{Im(t)}$$

$$Sh\_ROW\_Hi(t)=\frac{Im\_ROW\_Hi(t)}{Im(t)}$$

$$GL\_CU(t) = 1 - \frac{\sum_{i \in I_H} | Ex\_CU(t,i) - Im\_CU(t,i) |}{\sum_{i \in I_H} [Ex\_CU(t,i) + Im\_CU(t,i)]}$$

$$GL\_ROW(t) = 1 - \frac{\sum_{i \in I_H} | Ex\_ROW(t,i) - Im\_ROW(t,i) |}{\sum_{i \in I_H} [Ex\_ROW(t,i) + Im\_ROW(t,i)]}$$

$$RO(t) = \frac{Ex\_CU(t)}{Ex\_ROW(t)}$$

$$dRO(t) = RO(t) - RO(t-1)$$

$$Sh\_Tr\_CU(t) = \frac{Ex\_CU(t) + Im\_CU(t)}{Ex(t) + Im(t)}$$

$$Dum(t) = \begin{cases} 1 \text{ if } t \in \{3,6,9,12\} \\ 0 \text{ otherwise} \end{cases}$$

Appendix D

Results of Testing Regression Models

Table D1. Model for RCA in Trade with Eurasian Economic Community Countries, 1995 - 2000 (cross-sectional)

	1995	1996	1997	1998	1999	2000
Y-intercept	**-8,778** **-3,674****	**-10,591** **-3.194****	**-9,674** **-2.550*****	**-5,321** **-1.15**	**-5,646** **-1.628***	**-13,084** **-3.923****
Sh_Im_CU	**69,082** **3,173****	**76,801** **2.944****	**98,959** **3.405****	**111,107** **3.906****	**121,410** **4.340****	**130,292** **3.995****
Sh_Im_ROW	**35,088** **1,804****	**47,432** **1.925****	**9,896** **0.350**	**-39,370** **-1.107**	**-39,799** **-1.431***	**-67,890** **-1.419***
Int_CU_	**0,209** **2,811****	**0,102** **1.590***	**0,111** **1.596***	**0,215** **3.453****	**0,283** **4.800****	**0,453** **7.289****
Int_ROW_	**0,056** **0,844**	**0,343** **4.556****	**0,074** **1.065**	**0,101** **1.645****	**0,148** **2.275****	**0,128** **2.029****
RO	**0,582** **5,520****	**0,591** **8.834****	**0,090** **1.414***	**0,060** **0.821**	**0,098** **1.831****	**-0,029** **-0.580**
Sh_CU_Tr	**4,452** **0,977**	**1,023** **0.276**	**9,869** **3.127****	**14,647** **3.836****	**17,594** **4.620****	**6,190** **4.153****
Sh_ROW_Tr	**18,870** **2,381*****	**15,434** **2.456*****	**14,803** **1.885****	**0,916** **0.091**	**-3,049** **-0.427**	**-3,325** **-0.708**
R^2	**0,253**	**0.379**	**0.201**	**0.240**	**0.247**	**0.307**
F	**8,624*****	**16.4*****	**3.54****	**5.277****	**9.015*****	**12.232*****

Notes: figure in the cell refers to the value of a regression coefficient, lower figure refers to the value of t-statistic.

*- significant at the 90% level

** - significant at the 95% level

*** - significant at the 99% level

**** - significant 99,5% level

Tables D2. Model for RCA in Trade with the Rest of the World, 1995 - 2000. (cross-sectional)

	1995	**1996**	**1997**	**1998**	**1999**	**2000**
Y	-5,587 -2,176**	-14,932 -5,205****	-15,744 -5,054****	-19,313 -4,999****	-18,113 -5,699****	-1,225 -0,416
ShImCU	-6,872 -0,294	-16,272 -0,721	-20,473 -0,858	-40,825 -1,773**	-42,566 -1,660**	13,604 0,472
ShImpROW	51,900 2,483***	113,680 5,333****	139,412 6,010****	165,636 5,753****	171,402 6,723****	158,069 3,740****
IntCU_	-0,042 -0,524	0,010 0,171	0,026 0,459	-0,079 -1,566*	-0,056 -1,033	-0,029 -0,525
IntROW_	0,154 2,130**	0,365 5,609****	0,443 7,724****	0,441 8,874****	0,377 6,341****	0,359 6,428****
RO	-0,212 -1,871**	-0,182 -3,138****	-0,174 -3,341****	-0,171 -2,874****	-0,183 -3,733****	-0,184 -4,180****
ShCUTr	8,838 1,806**	3,751 1,172	1,037 0,400	-2,448 -0,792	-1,763 -0,505	1,145 0,869
ShROWTr	5,829 0,684	21,359 3,928****	30,544 4,476****	39,953 4,913****	38,536 5,891****	11,020 2,656****
R^2	0,146	0,357	0,423	0,485	0,433	0,382
F	4,359**	14,9***	20,199***	26,289***	20,949***	17,037***

Notes: figure in the cell refers to the value of a regression coefficient, lower figure refers to the value of t-statistic.

*- significant at the 90% level

** - significant at the 95% level

*** - significant at the 99% level

**** - significant 99,5% level

Table D3. Model for RCA, 1998-2000

	Eurasian Economic Community	Rest of the World
Y	**1,210** **0,440**	**2,863** **5,362****
Sh_CU_Hi (-2)	**-11,433** **-1,602***	**-**
Sh_CU_Hi (-3)	**-**	**-2,973** **-2,036****
Sh_ROW_Hi (-2)	**2,891** **0,599**	**1,757** **3,518*****
Sh_ROW_Hi (-3)		**3,351** **3,353****
GL_CU	**-6,342** **-3,530****	**-0,237** **-0,564**
GL_ROW	**4,640** **2,431*****	**-1,312** **-3,043*****
RO	**-0,017** **-0,069**	
dRO	**-0,461** **-1,673***	**0,292** **3,505****
Sh_Tr_CU	**4,461** **1,679**	**-1,797** **-1,600***
Int_Tr_Hi	**0,022** **0,117**	**-0,033** **-2,480*****
Dum	**-0,064** **-0,374**	**-0,020** **-0.541**
R^2	**0,761**	**0,860**
F	**8,126*****	**16,130*****
DW	**1,417**	**1,456**

Notes: figure in the cell refers to the value of a regression coefficient, lower figure refers to the value of t-statistic.
*- significant at the 90% level
** - significant at the 95% level
*** - significant at the 99% level
**** - significant 99,5% level

Head of the Project,
Senior Research Fellow
of the Institute of Economics
of the National Academy of Sciences of Belarus Irina E. Tochitskaya

Participant of the project,
Associate Professor of the Department
of Applied Mathematics and Economics Cybernetics
of the Belarus State Economics University Ernest M. Aksen