

JOINING THE CUSTOMS UNION WITH CIS COUNTRIES: THE CASE OF BELARUS

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Abstract:

The authors analyze the dynamic economic effects of Belarus' participation in the CIS countries Customs Union in 1996 - 2000. Based on the theoretical and applied approaches has been used in the study of regional economic integration there was estimated the impact of RIAs and, specifically, customs union, with regard to the transition economies of the CIS countries. Econometric evaluation focuses on the assessment of the impact of the Customs Union on revealed comparative advantage, which calculated for group of medium- and hi-tech products as easily interpretable measure of their competitiveness and efficiency of production. Two set of independent variables have been used, those including possibility of technology, knowledge transfer and proxies, dummies of regional integration. It is shown that Belarus' participation in the Customs Union results in trade diversion effect, besides it 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.

Keywords: Belarus, economic integration, dynamic effects

Introduction

The last ten-fifteen years are characterized by an exceptional splash in the interest to the regional integration. Turning into the dominant factor of the world trade, the regionalism affects both economic and political relations between countries, confronting them with the choice whether to join that or another trade block, which form of integration should be preferred at the given moment etc.

Such questions have been discussed among new independent states after break up of the USSR. The impetus for the creation of regional arrangements among Commonwealth of Independent States (CIS) countries was the aspiration to maintain and restore the economic ties as well as desire to keep on traditional export markets and to decrease by using high external trade barriers the competitive pressure from the rest of the world. As a first attempt of trade cooperation it should be considered the protracted process of CIS counties Free Trade Zone formation. Besides in 1995 three countries - Belarus, Kazakstan and Russia - established a Customs Union (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 Custom Union. According to Belarussian trade data in 1995 republic exported 54% of good 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 1). As regards trade with traditional CIS partners (non-members) the 2000 share of republic's exports (14%) and imports (7%) were almost two-time lower the corresponding 1995 level. Second, the Customs Union members negotiated a common external tariff based on Russian tariff system as a result belarussian average unweighted tariff rose in 1995 -2000 from 12.3% to 13% and in manufactured products up to 15%.

Table 1. 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*	60,2	53,8*	39,8	46,0*	56,9	54,0*	43,1
	66,7	53,0**	33,3	47,0**	54,7	66,0**	45,3	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 r", "Foreign Trade of the Republic of Belarus, 2000 ", authors' calculations

* data for 1995 .

** data for 2000.

Since more than five years passed by it is useful to make more detail analysis of the implication of above trends on belarussian economy and assessment whether membership in the CIS countries CU is an effective element of national development strategy.

So far a large number of theoretical and empirical studies focuses on the problems of the welfare effects of regional integration arrangements (RIAs), labor migration, exchange rate agreements, real convergence and etc., faced by regional blocs that were formed between high income, developing countries or both of them (NAFTA). However there is a lack of literature looking at the process of trade bloc formation among CIS countries and examining the issues arising within this regional grouping, in particular the economic and political effects on the partners.

Our objective in this paper is to examine does Belarus' participation in the Customs Union facilitates 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 formation of the new comparative advantages and economic growth in the country.

The paper is organized as follows. The next section discusses some issues of potential dynamic costs and benefits of RIAs accession emphasized in literature; Section 3 develops theoretical model; Section 4 describes the empirical methodology and contains results of the empirical estimations, while Section 5 concludes.

Review of literature

Following the Viner's tradition recent empirical evaluations of the RIAs within Commonwealth of Independent States has been concentrated on the static welfare (trade creation, trade diversion) effects of integration (e.g. Gonzales and Farrell (1996)). While estimations of potential dynamic benefits and losses have not been employed.

The 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 the dynamic gains unlike static is 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 theoretical 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) analyzing the rates of the growth of the production factors' productivity in the OECD countries and in a series of developing countries constructed the index of total knowledge capital based on the investments directed into R&D. As a starting premise, they assumed that, in the trade process, the countries get access to so called stock of knowledge (accumulated investments into R&D) proportionally to how much their imports are high-tech. The results of the studies showed the high degree of the dependence between the growth in the total factor productivity and the access to the foreign knowledge funds. In her turn, Madani (2000) examining the implications of Bolivia, Colombia and Ecuador membership in Andean Pact found that import of intermediate goods from the rest of the world facilitate economic growth unlike intra-block imports.

Growth regressions typically estimate impact on GDP or real income growth of RIAs using the set of variables, e.g. dummy variables (Brada & Mendez (1988); Casella (1996)) or a measure of inter and intra- regional trade volumes and flows amongst member countries (Italianer (1994)), investment series and labor and physical capital (Coe & Moghadam (1993)). Most studies use EU time-series and cross-sectional data. The main findings from these models are that even if adherence to trade bloc does have the growth effect the gains are small.

Model

The following model is introduced for estimation of the influence of country's participation in the Customs Union within CIS on the possibility of obtaining modern technologies and production factors, and, consequently, on its productivity growth, given a situation in which common external tariff is higher than the initial tariff. .

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:

$$\pi_1 = R(q) - P \cdot q, \quad (1)$$

$$\pi_2 = \pi_2(q). \quad (2)$$

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 \hat{q} of the high-tech product utilization at present such $\pi_2(q) = \pi_2^-$ for all $q \leq \hat{q}$, and $\pi_2(q) = \pi_2^+$ for all $q > \hat{q}$ (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 $q \leq \hat{q}$ and for $q > \hat{q}$.

Denote by π_1' the maximum value of π_1 for $q \leq \hat{q}$, and by π_1'' the maximum value of π_1 for $q > \hat{q}$ (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.

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 $\lim_{R \rightarrow \infty} \frac{dR}{dq} = 0$. Then the profit

maximization problems:

$$\pi_1 = R(q) - P \cdot q \rightarrow \max, \quad (3)$$

$$0 \leq q \leq \hat{q}, \quad (4)$$

and

$$\pi_1 = R(q) - P \cdot q \rightarrow \max, \quad (5)$$

$$q \geq \hat{q}, \quad (6)$$

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

Note that

$$q' \leq q'', \quad (7)$$

and if $q' = q''$, then $q' = q'' = \hat{q}$.

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

Thus

$$q' < q'' \quad (8)$$

if $P \neq \hat{P}$;

$$q' = q'' = \hat{q} \quad (9)$$

if $P = \hat{P}$.

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

$$\frac{d}{dP} \pi_1'(P) = -q', \quad (10)$$

$$\frac{d}{dP} \pi_1''(P) = -q''. \quad (11)$$

From (A.31) – (A.34) it follows that

$$\frac{d}{dP} \pi_1'(P) > \frac{d}{dP} \pi_1''(P) \quad (12)$$

if $P \neq \hat{P}$;

$$\frac{d}{dP} \pi_1'(P) = \frac{d}{dP} \pi_1''(P) \quad (13)$$

if $P = \hat{P}$.

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

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.

Econometric evaluations

In our study we have used 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. 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-planned times appears to be especially crucial. To think about how comparative advantages are changed we look at the restructuring and production efficiency growth, in its

turn it allows to highlights the issue of dynamic effects of RIAs in CIS. The question that might be addressed is how membership at Customs Union among the CIS will affect creation new and improvement the existing Belarus's comparative advantages through possibility to access diverse and modern intermediate products and technologies.

As the main estimated indicator, the coefficient of revealed comparative advantages was used. It was calculated separately for the exports to the CU countries and ROW countries. For the calculations, the OECD methodology (Statistics of Foreign Trade, Series A) was used:

$RCA_i = \ln\left(\frac{Ex_i^{CU}}{Im_i^{CU}} / \frac{Ex^{CU}}{Im^{CU}}\right)$, where Ex_i^{CU} is the export of commodity i to the Customs Union (rest of the world), Im_i^{CU} is the import of commodity i from the CU (ROW).

The analysis is based on the official data of Belarus' Ministry of Statistics and Analysis about the state of foreign trade in years 1996 - 2000 in the four-digit commodity code. In the process of our research we planned to use the data for year 1995 (the year of the formation of the Customs Union) as the starting point for the analysis of the trends. However, because of the absence of the data (in the commodity codes) for this year both in the Ministry of Statistics and Analysis and the UN Comtrade database, all the comparisons were made with year 1996, which is quite admissible taking into account that the final formation of this preferential trade association was completed only in that year, and a certain time period exists between the introduction of the customs duties and their impact on the process of production and consumption.

For the analysis, we selected 203 commodities belonging to the group of medium- and hi-tech goods according to the classification of OECD. The emphasis on this group of commodities was done due to their significant specific weight in the Belarus' export structure (especially to the CU countries), high 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, (1997a)).

During the period 1996 - 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%. Based on the comparison of regional trade orientation indices (the ratio of the exports to the CU and the exports to the ROW) and the index of revealed comparative advantages for the ROW countries in the selected commodity group we made the estimation of how much the regional trade orientation conforms with the comparative advantages. Thus, we tested whether the commodities characterized by the growth of the export to the CU have costs low enough to be able to compete in the markets, which are not protected by preferential trade barriers. In other words, whether the country is in position to successfully export the given commodities to the markets of ROW countries. Note that by itself the regional trade orientation index is not sufficiently informative but its change in the short-run and average-run period is of higher interest. Since during relatively short time period the alteration in the transport costs, consumers' tastes are minimal, it is usual to think that it is more affected by the trade barriers.

The calculations reveal, 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. And only 12 commodities for which the trade intensity increased are competitive in the ROW markets not protected by trade barriers. As to the selected group of medium and

high-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 been indicated. The reason for this, in our opinion, is in the trade barriers protecting producers from the competition from outside. The next stage of our analysis is the study of how much the participation in the preferential trade agreement (Customs Union) contributes to the improvement of existing and the formation of new comparative advantages.

For the quantitative estimation of factors determining the RCA coefficient, the regression models were used. The research was conducted in two directions: cross-sectional analysis of the impact of the selected predictive indicators on the RCA coefficients for the 203 goods belonging to the 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 were divided into two groups, the first of which was associated with the general factors determining the changes in the comparative advantages, the second one was associated with Belarus' participation in the Customs Union.

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

- Describing the possibility of obtaining new technology and know-how, the transmission of new knowledge: the share of imports of medium and hi-tech products from the Customs Union in the total imports ($ShImCU$), the share of imports of medium and hi-tech products from the rest of the world in the total imports ($ShImROW$), intensity of the exchange of a given commodity within the CU or the level of intra-industry trade ($IntCU$), intensity of the exchange of the given commodity with the ROW countries ($IntROW$).
- Describing the effects of Belarus' participation in the CU: regional orientation index* (RO), the share of the trade with the CU countries in the total volume of trade for the group of medium and high-tech products ($ShCUTr$), the share of the trade with the ROW countries in the total volume of trade for the group of medium and high-tech commodities ($ShROWTr$). 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:

$$RCA_{CU} = a + b1 ShImCU + b2 ShImROW + b3 IntCU + b4 IntROW + b5 RO + b6 ShCUTr + b7ShROWTr$$

$$(14) \quad RCA_{ROW} = a + b1 ShImCU + b2 ShImROW + b3 IntCU + b4 IntROW + b5 RO + b6 ShCUTr + b7ShROWTr \quad (15)$$

The results of the estimation of these models are in tables 2 and 3. For the analysis of the regressors, their statistical significance and impact on the resulting indicator, year 1996 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 is shown in the following way:

While in year 1996 the indicator of the share of trade with the CU countries 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

* 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.

* At the calculation of RCA for the regression equations, the formula used before was modified with the help of the logistic distribution function and it took the form: $RCA_i = (Ex_i^j / Im_i^j) / (Ex_i^j / Im_i^j + Ex^j / Im^j)$, where i is the kind of commodity, j is the CU or ROW.

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 1 point 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 lost its significance, which it had had in years 1996 and 1997 (with the coefficient equal to 15,4 and 14,8 respectively), and in years 1999 – 2000, in addition, it took the negative sign. A similar tendency can be noticed also for the share of imports for the medium and high-tech industrial products from the ROW countries. At the same time, 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 a 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 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.

Table 2. Model for RCA in Trade with Eurasian Economic Community Countries, 1996 - 2000 (cross-sectional)

	1996	1997	1998	1999	2000
Y-intercept	-10,591 -3.194****	-9,674 -2.550***	-5,321 -1.15	-5,646 -1.628*	-13,084 -3.923****
ShImCU	76,801 2.944****	98,959 3.405****	111,107 3.906****	121,410 4.340****	130,292 3.995****
ShImpROW	47,432 1.925**	9,896 0.350	-39,370 -1.107	-39,799 -1.431*	-67,890 -1.419*
IntCU_	0,102 1.590*	0,111 1.596*	0,215 3.453****	0,283 4.800****	0,453 7.289****
IntROW_	0,343 4.556****	0,074 1.065	0,101 1.645**	0,148 2.275**	0,128 2.029**
RO	0,591 8.834****	0,090 1.414*	0,060 0.821	0,098 1.831**	-0,029 -0.580
ShCUTr	1,023 0.276	9,869 3.127****	14,647 3.836****	17,594 4.620****	6,190 4.153****
ShROWTr	15,434 2.456***	14,803 1.885**	0,916 0.091	-3,049 -0.427	-3,325 -0.708
R ²	0.379	0.201	0.240	0.247	0.307
F	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

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 before, 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 (15), it follows that the change in RCA_{ROW} was affected mainly by the four factors: share of imports of medium and high-tech products from the ROW countries, intensity of exchange of these products with the ROW countries, the change in the regional trade orientation index, the specific weight of the ROW countries in the total volume of trade. The indicator of the share of high-tech imports from the ROW countries 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.

The factors characterizing the effects of Belarus' participation in the Customs Union had the following impact on RCA_{ROW} :

Tables 3. Model for RCA in Trade with the Rest of the World, 1996 - 2000.
(cross-sectional)

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

The share of trade with the ROW countries had the positive sign and was 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 had the negative sign, i.e. the consequence of the increase in the export orientation towards the CU countries was the deterioration of the comparative advantages in the ROW markets. The share of trade with the CU countries was insignificant.

The obtained results of the estimation of equation (15) conform with 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 1996 - 1997 representing “transition period” and years 1998 - 2000 when the effects of the participation in this regional trade agreement became stronger. As the result of this, the next stage of our analysis was the estimation of the impact of the factors related to the policy of regional integration and transfer of new knowledge, technology, know-how on the change of revealed comparative advantages in the group of the 203 medium and high-tech industrial products. For our analysis, we used 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- $SHCUHi$ (ROW countries- $SHROWHi$) in the total volume of imports with the lags in one, two and three months, as well as Grubel-Lloyd coefficients reflecting the level of intra-industry trade and calculated for each of the mentioned above geographical directions ($GLCU$, $GLROW$). The impact of the participation in the Customs Union on the resulting indicator was estimated with the help of the following explanatory variables: regional orientation index (RO), change in regional orientation index (dRO), intensity of trade with the countries of the regional trade block ($IntTrH$), share of trade with the CU countries ($ShTrCU$), and dummy describing the change in tariffs (Dum).

For depending variables, we calculated 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:

$$RCA_{CU} = a + b1 SHCUHi(-1) + b2 SHCUHi(-2) + b3 SHCUHi(-3) + b4 SHROWHi(-1) + b5 SHROWHi(-2) + b6 SHROWHi(-3) + b7 GLCU + b8 GLROW + b9 RO + b10 dRO + b11 ShTrCU + b12 IntTrHi + b13 Dum \quad (16)$$

$$RCA_{ROW} = a + b1 SHCUHi(-1) + b2 SHCUHi(-2) + b3 SHCUHi(-3) + b4 SHROWHi(-1) + b5 SHROWHi(-2) + b6 SHCUHi(-3) + b7 GLCU + b8 GLROW + b9 RO + b10 dRO + b11 ShTrCU + b12 IntTrHi + b13 Dum \quad (17)$$

The results of the estimation of our regression models are in Table 4. For the trade within the Customs Union, statistically significant regressors are Grubel-Lloyd intra-industry trade index and three indicators characterizing the impact of the participation in the regional block: regional orientation index, share of trade with CU member countries in the total volume of trade, and intensity of trade in high-tech products with CU countries. The last two variables have positive signs meaning that the increase in the trade orientation towards the CU member countries positively influences the revealed comparative advantages of commodities supplied to the given markets. Note also that the indicator of the share of trade with the CU member countries in the total volume of trade has the highest regression coefficient (10,25). However

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

at the same time the strengthening of the regional trade orientation towards the Customs Union and the increase of intra-industry trade within it negatively influences the resulting indicator. This result could mean that protective trade barriers allow Belarussian firms to compete in the markets of CU member countries (with Russia in the first place). At the same time the increment 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 thereof best-practice production techniques, quality standards of medium-and hi-tech products in CU countries are different from those in the global economy. The same conclusion arises with respect to regional orientation index. Being aware that CU markets are shielded by preferential trade arrangement, Belarussian 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 Belarussian products meet them. As a result index of regional orientation of export negatively associated 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 Belarussian products outside the preferential agreement. The results of estimation equation (17) 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 above group of products from the rest of the world with two and three month lag and positive influence.

Table 4. Model for RCA, 1998-2000

	Eurasian Economic Community	Rest of the World
Y	-2,157 -1,060	2,863 5,362****
ShImCUHi (-1)	4,575 0,620	-1,925 -0,993
ShImCUHi (-2)	3,940 0,419	-2,408 -0,977
ShImCUHi (-3)	2,376 0,336	-3,837 -2,070**
ShImROWHi (-1)	-2,326 -0,413	0,630 0,427
ShImROWHi (-2)	-1,605 -0,289	2,934 2,020**
ShImROWHi (-3)	1,720 0,432	3,486 3,340****
GLCU	-5,667 -3,204****	-0,143 -0,310
GLROW	-0,648 -0,270	-0,530 -0,839
RO	-1,670 -3,681****	0,200 1,684**
dRO	0,216 0,485	0,241 2,069**
ShTrCU	10,247 2,005**	-2,162 -1,613*
IntTrHi	0,139	-0,047

	2,286**	-2,915***
Dum	-0,125	-0,014
	-0,814	-0,337
R ²	0,866	0,885
F	9,445***	11,223***
DW	1,421	1,479

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

These results conform with the dynamic effects hypothesis. As the interpretation of impact of last two parameters was considered when explaining regression models (14)-(15) 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 $ShTrCU$ has a negative sign and high value, indicating that 1 point increase in the share of trade with CU countries leads to a decrease of comparative advantage by 2,2 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 also static trade effects. 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 of production 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 means 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 regional, orientation and changes of regional orientation regressors which have turned out to be positive. This fact is difficult to interpret substantively but as in the case of model (15) the sign is "correct", i.e. correspond to the suggested hypotheses. It possibly can be explained by the fact that RO index was computed using data for whole exports and 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.

Conclusions

The analysis of the economic effects of Belarus participation in the CIS countries CU for 1996 - 2000 has shown that after joining this regional trade arrangement country tend to be less competitive in the markets of the rest of the world in products where trade increased its intensity and reoriented towards the CU. As the findings have indicated 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 at the rest of the world occurred for 112 (82%) commodities out of the group of commodities for which the strengthening of the orientation towards the CU countries occurs. And only 12 commodities for which the trade intensity increased are competitive in the ROW markets not

protected by trade barriers. The reasons of it are, from our viewpoint, trade barriers that give Belarussian firms preferential access to partner markets and protect them from outside competition. The outcomes are lack of significant restructuring and efficiency enhancing at Belarussian enterprises over the period of CU membership.

The quantitative estimations of the factors determining the changes of revealed comparative advantage and therefor competitiveness and efficiency of production were carried out on the basis of regression models included two sets of explaining variables, those coherent with possibility of technology, knowledge transfer and proxies, dummies of regional. 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 and economic growth in the country.

We found the expected impact from the variables characterizing the implication of Belarus' participation in CU for the changes of revealed comparative advantage, i.e. the increase of 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 Belarussian goods were not shielded by preferential trade arrangement but 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. Concerning the trade within the CU, the changes of the sign of this indicator from positive to negative were caused by an increase of external tariff and switch to import from partner countries producers. All above facts testify the crucial need for foreign trade policy adjustment in the field of regional integration and elaboration of the alternative approaches with regard to the participation in RIAs.

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Table 1. 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*	60,2	53,8*	39,8	46,0*	56,9	54,0*	43,1
	66,7	53,0**	33,3	47,0**	54,7	66,0**	45,3	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 r", "Foreign Trade of the Republic of Belarus, 2000 ", authors' calculations

* data for 1995 .

** data for 2000.

Table 2. Model for RCA in Trade with Eurasian Economic Community Counties, 1996 - 2000 (cross-sectional)

	1996	1997	1998	1999	2000
Y-intercept	-10,591 -3.194****	-9,674 -2.550***	-5,321 -1.15	-5,646 -1.628*	-13,084 -3.923****
ShImCU	76,801 2.944****	98,959 3.405****	111,107 3.906****	121,410 4.340****	130,292 3.995****
ShImpROW	47,432 1.925**	9,896 0.350	-39,370 -1.107	-39,799 -1.431*	-67,890 -1.419*
IntCU_	0,102 1.590*	0,111 1.596*	0,215 3.453****	0,283 4.800****	0,453 7.289****
IntROW_	0,343 4.556****	0,074 1.065	0,101 1.645**	0,148 2.275**	0,128 2.029**
RO	0,591 8.834****	0,090 1.414*	0,060 0.821	0,098 1.831**	-0,029 -0.580
ShCUTr	1,023 0.276	9,869 3.127****	14,647 3.836****	17,594 4.620****	6,190 4.153****
ShROWTr	15,434 2.456***	14,803 1.885**	0,916 0.091	-3,049 -0.427	-3,325 -0.708
R ²	0.379	0.201	0.240	0.247	0.307
F	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 3. Model for RCA in Trade with the Rest of the World, 1996 - 2000.
(cross-sectional)**

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

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ShImROWHi (-1)	-2,326 -0,413	0,630 0,427
ShImROWHi (-2)	-1,605 -0,289	2,934 2,020**
ShImROWHi (-3)	1,720 0,432	3,486 3,340****
GLCU	-5,667 -3,204****	-0,143 -0,310
GLROW	-0,648 -0,270	-0,530 -0,839
RO	-1,670 -3,681****	0,200 1,684**
dRO	0,216 0,485	0,241 2,069**
ShTrCU	10,247 2,005**	-2,162 -1,613*
IntTrHi	0,139 2,286**	-0,047 -2,915****
Dum	-0,125 -0,814	-0,014 -0,337
R ²	0,866	0,885
F	9,445***	11,223***
DW	1,421	1,479

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*- significant at the 90% level

** - significant at the 95% level

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