

Effects of Trade Wars on Belarus

Aleksandr Vashchilko

BEROC

Abstract

This paper looks at the effects of the trade wars that followed 2014 events in Ukraine on Belarus. The estimation of the model predicts the increase in the tariff revenue collected by Belarus. Because of ban on imports, the tariff revenue of Russian Federation declines. Being a part of Customs Union, Belarus needs to participate in the tariff revenue redistribution. The need to participate in the tariff revenue redistribution and the decline in the tariff revenue collected by Russian Federation lead to the decrease in the welfare of Belarus. To avoid this decrease, Belarus should argue for the modification of the redistribution schedule.

Keywords: trade wars, FTA, CU

JEL Classification: F13, F14

1 Introduction

Countries could impose tariffs against each other because of political motives. This paper looks at the effects of the trade wars that followed 2014 events in Ukraine. Though Belarus did not take part in trade wars undertaken by the other countries, these trade wars affected its welfare through the international trade linkages. The goal of this study is to find how the trade wars affected Belarus and how Belarus should have responded to these trade wars.

To make better predictions of trade war outcome, it is important to understand the trade arrangements that existed before trade wars started. Before year 2011 and after breakup of Soviet Union, Belarus, Russian Federation, Ukraine, Uzbekistan, Moldova, Armenia, Kyrgyzstan, Tajikistan and Kazakhstan, which had been CIS members, predominantly had a free trade between themselves and were free to choose the size of tariffs in trade with the other countries. It means that CIS countries de facto had been part of FTA during this period of time. In year 2011, these countries officially established CIS Free Trade Area (CIS FTA). So, we can state that CIS countries had been the part of FTA in year 2004, for which the data will be used in this study. Additional feature of FTA is that FTA members keep their tariff revenues to themselves and do not redistribute it among the members.

In year 2010, Russian Federation, Belarus, and Kazakhstan formed Customs Union of Eurasian Economic Union (EAEU CU). Later Armenia in 2014 and Kyrgyzstan in 2015 joined

EAEU CU. The members of EAEU CU as the members of CIS FTA had free trade between themselves. At the same time, as the members of EAEU CU, they had the obligation to apply the same tariff against outside countries. The exception was made for CIS FTA members with whom EAEU CU members had free trade. In addition, EAEU CU members had an obligation to distribute the total tariff revenue according to the schedule: Russian Federation: 85.33%, Kazakhstan: 7.11%, Belarus: 4.55%, Kyrgyzstan: 1.9%, Armenia: 1.11%.¹ Shadikhodjaev (2009) discusses the details of formation of CIS FTA and EAEU CU.

Following the political protests in 2014, Ukraine terminated its membership in CIS FTA and moved toward becoming the part of EU. The political protests grew up into armed conflict and the partial loss of the territory by Ukraine. These events made the western countries to introduce the sanctions against some Russian Federation citizens and enterprises. In response, Russian Federation introduced the ban on imports from EU countries, Australia, Norway, and USA. The imports of Meat Products Sector, Dairy Products Sector, and Vegetables, Fruits, Nuts Products Sector from these countries had been banned. Because of the tensions between Ukraine and Russian Federation, both countries banned the imports from each other in the mentioned sectors.

Because of the ban on imports by Russian Federation, the trade flow through Belarus increased. According to the conducted estimation, the import by Belarus in Meat Products Sector increases by 28%. And the import in Dairy Products Sector increases by 47%. The increase in imports by Belarus transforms into the increase in its tariff revenue. At the same time, the tariff revenue collected by Russian Federation decreases. While Belarus could claim the fixed portion (4.55%) of the total tariff revenue of EAEU CU, its after distribution tariff revenue declines. In these circumstances, the option of switching back to CIS FTA status leads to the increase in the welfare of Belarus. As a member of CIS FTA, Belarus will not need to share the increased tariff revenue with the other countries.

Evaluation of the effects of the trade wars is done using the methodology outlined in Ossa (2014). The framework is based on the monopolistic competition market structure, which was introduced into international trade by Krugman (1979) and Krugman (1981). This market structure allows for two-way trade within an industry of a specific country. The framework in Ossa (2014) allows for many countries and sectors and for the prediction of the outcome of the changes in tariffs by one or several countries. Perroni and Whalley (2000) and Caliendo and Parro (2012) present different frameworks with many countries for the estimation of the welfare effects of the tariff changes by several countries.

The remainder of this paper includes: Section 2, which outlines the model; Section 3, which describes the data; Section 4, which provides results and describes the underlying mechanisms behind stated results, and Section 5, which provides conclusions.

¹Agreement about the redistribution of the import tariff revenue, May 20, 2010

2 Model

2.1 General model

The model setup is as in Ossa (2014). There are N countries. These N countries are indexed by i or j . The utility function across consumers within Country j is specified as:

$$U_j = \prod_s \left(\sum_i \int_0^{M_{is}} x_{ijs} (\nu_{is})^{\frac{\sigma_s-1}{\sigma_s}} d\nu_{is} \right)^{\frac{\sigma_s-1}{\sigma_s-1} \mu_{js}}$$

where x_{ijs} is the quantity of variety, ν_{is} , from the industry s of country i that was consumed in country j .

Each variety is uniquely associated with an individual firm. Within a particular country, the technology is homogeneous across firms and summarized by the following inverse production functions:

$$l_{is} = \sum_j \frac{\theta_{ijs} x_{ijs}}{\varphi_{is}}, \quad (1)$$

where $\theta_{ijs} \geq 1$ is the iceberg trade barrier. The expression (1) specifies the amount of labor demanded by the company in Sector s of Country i provided it sells quantities x_{ijs} across countries.

Utility maximization implies that firms in industry s of country i face the demand $x_{ijs} = \frac{(\theta_{ijs} p_{is} \tau_{ijs})^{-\sigma_s}}{P_{js}^{1-\sigma_s}} \mu_{js} X_j$ from the consumers in Country j , where $\tau_{ijs} = 1 + t_{ijs}$. t_{ijs} represents advalorem tariff imposed by Country j on goods coming from country i in Sector s . X_j and P_{js} represent Country j 's income and its Sector s price index. $\theta_{ijs} p_{is}$ represents the before tariff price of the variety shipped from country i to country j within Sector s . Correspondingly, p_{is} is the factory price of this variety.

Given CES preferences, within this environment producers set prices with the constant markup over marginal cost:

$$p_{is} = \frac{\sigma_s}{\sigma_s - 1} \frac{w_i}{\varphi_{is}}. \quad (2)$$

The trade flow from Country i to Country j within Sector s that is evaluated at the world prices is equal to $T_{ijs} = M_{is} x_{ijs} \theta_{ijs} p_{is}$. The expressions for x_{ijs} and p_{is} give the expression for the trade flow

$$T_{ijs} = M_{is} \left(\frac{\sigma_s}{\sigma_s - 1} \frac{\theta_{ijs} w_i}{\varphi_{is} P_{js}} \right)^{1-\sigma_s} \tau_{ijs}^{-\sigma_s} \mu_{js} X_j. \quad (3)$$

After the substitution of the expressions for l_{is} , x_{ijs} , and p_{is} into $\pi_{is} = M_{is} \sum_j p_{is} \theta_{ijs} x_{ijs} -$

$M_{is}w_il_{is}$, we receive that

$$\pi_{is} = \frac{1}{\sigma_s} \sum_j M_{is} \left(\frac{\sigma_s}{\sigma_s - 1} \frac{\theta_{ijs}}{\varphi_{is}} \frac{w_i}{P_{js}} \right)^{1-\sigma_s} \tau_{ijs}^{-\sigma_s} \mu_{js} X_j. \quad (4)$$

Taking into account the expression (3), the industry-level profit can be written as $\pi_{is} = \frac{1}{\sigma_s} \sum_j T_{ijs}$ and can be computed using the data on trade flows between countries.

Further, after the substitution of the expression (2) for p_{is} into the expression for the price index $P_{js} = \left(\sum_i M_{is} (p_{is} \theta_{ijs} \tau_{ijs})^{1-\sigma_s} \right)^{\frac{1}{1-\sigma_s}}$, P_{js} can be expressed through wage rates across countries:

$$P_{js} = \left(\sum_i M_{is} \left(\frac{\sigma_s}{\sigma_s - 1} \frac{w_i \theta_{ijs} \tau_{ijs}}{\varphi_{is}} \right)^{1-\sigma_s} \right)^{\frac{1}{1-\sigma_s}}. \quad (5)$$

Also, after the substitution of the expressions (1) and (2) for l_{is} and p_{is} into the expression for the profit collected by the firms $\pi_{is} = M_{is} \left(\sum_j p_{is} \theta_{ijs} x_{ijs} - w_i l_{is} \right)$, we receive $w_i M_{is} l_{is} = \pi_{is} (\sigma_s - 1)$. Further, the substitution of this expression into the labor market clearing condition $L_i = \sum_s M_{is} l_{is}$ gives

$$w_i L_i = \sum_s \pi_{is} (\sigma_s - 1). \quad (6)$$

Country's income equals to its labor income, tariff revenue and firms' profits:

$$X_j = w_j L_j + \sum_i \sum_s t_{ijs} T_{ijs} + \sum_s \pi_{js} \quad (7)$$

As pointed out in Ossa (2014), the conditions (4) - (7) can be solved for unknowns w_i , X_i , P_{is} , and π_{is} given numeraire and the parameters $\{M_{is}, \theta_{ijs}, \varphi_{is}\}$. At the same time, the estimation of these parameters is not easy and precludes the solution of the conditions (4) - (7) for unknown variables.

2.2 Model in changes

To avoid the estimation of the parameters $\{M_{is}, \theta_{ijs}, \varphi_{is}\}$, Ossa (2014) suggested to write down the the conditions (4) - (7) in ratios instead of levels. Expressing the model variables in ratios was used before by Dekle, Eaton, Kortum (2007). Let $\hat{x} = \frac{x'}{x}$, according to Ossa

(2014), the expression (4) becomes

$$\hat{\pi}_{is} = \sum_j \alpha_{ijs} \left[\frac{\hat{w}_i}{\hat{P}_{js}} \right]^{1-\sigma_s} (\hat{\tau}_{ijs})^{-\sigma_s} \hat{X}_j, \quad (8)$$

where $\alpha_{ijs} = \frac{T_{ijs}}{\sum_n T_{ins}}$ and can be computed using the data on trade flows and tariffs. Further, Ossa (2014) rewrites the expression (5) as

$$\hat{P}_{js} = \left(\sum_i \gamma_{ijs} (\hat{w}_i \hat{\tau}_{ijs})^{1-\sigma_s} \right)^{\frac{1}{1-\sigma_s}}, \quad (9)$$

where $\gamma_{ijs} = \frac{\tau_{ijs} T_{ijs}}{\sum_m \tau_{mjs} T_{mjs}}$. The expression (6) can be written in ratios as

$$\hat{w}_i = \sum_s \delta_{is} \hat{\pi}_{is}, \quad (10)$$

where $\delta_{is} = \frac{\sum_j \frac{\sigma_s - 1}{\sigma_s} T_{ijs}}{\sum_t \sum_n \frac{\sigma_t - 1}{\sigma_t} T_{int}}$. The expression (7) in ratios can be written as

$$\hat{X}_j = \frac{w_j L_j}{X_j} \hat{w}_j + \sum_i \sum_s \frac{t'_{ijs} T_{ijs}}{X_j} (\hat{\tau}_{ijs})^{-\sigma_s} \left[\frac{\hat{w}_i}{\hat{P}_{js}} \right]^{1-\sigma_s} \hat{X}_j + \sum_s \frac{\pi_{js}}{X_j} \hat{\pi}_{js} \quad (11)$$

The expression (11) differs from the one in Ossa (2014) as it does not contain \hat{t}_{ijs} , which can not be identified when t_{ijs} is equal to zero.

The expressions (4), (6), (7), and the assumption of the balanced trade across countries give $X_j = \sum_i \sum_s \tau_{ijs} T_{ijs}$. Also, the expressions (4), (6) lead to $w_j L_j = \sum_i \sum_s \frac{\sigma_s - 1}{\sigma_s} T_{jis}$. As result, α_{ijs} , δ_{is} , γ_{ijs} , π_{js} , $w_j L_j$, and X_j in equations (8) - (11) can be computed using the data on tariffs, t_{ijs} , and the values of trade flows, T_{ijs} , evaluated at the world prices. Given the changes in tariffs \hat{t}_{ijs} , the equations (8) - (11) can be solved for \hat{w}_i , \hat{X}_i , $\hat{\pi}_{is}$, and \hat{P}_{js} . Only the information on the trade flows and tariffs is needed to find the response of variables in the model to the changes in tariffs.

Given the response to the changes in tariffs, the changes in the variables of interest can be computed. The changes in trade flows are equal to $\hat{T}_{ijs} = \left[\frac{\hat{w}_i}{\hat{P}_{js}} \right]^{1-\sigma_s} (\hat{\tau}_{ijs})^{-\sigma_s} \hat{X}_j$. The change in country's welfare level is equal to $\hat{W}_i = \frac{\hat{X}_i}{\hat{P}_i}$, where $\hat{P}_i = \prod_s (\hat{P}_{is})^{\mu_{is}}$. In addition to the change in welfare, the changes in the components that welfare consists of can be computed. The change in real wage is computed as $\hat{w}_i = \frac{\hat{w}_i}{\hat{P}_i}$. The change in real tariff revenue is computed as $\hat{R}_i = \frac{\hat{R}_i}{\hat{P}_i}$, where $R_i = \sum_s \sum_j t_{jis} T_{jis}$. As mentioned in Ossa (2014), the change in welfare

can be decomposed as

$$\begin{aligned}
\frac{\Delta W_j}{W_j} &\approx \sum_i \sum_s \frac{T_{ijs}}{X_j} \left[\frac{\Delta p_{js}}{p_{js}} - \frac{\Delta p_{is}}{p_{is}} \right] + \\
&+ \sum_s \frac{\pi_{js}}{X_j} \left[\frac{\Delta \pi_{js}}{\pi_{js}} - \frac{\Delta p_{js}}{p_{js}} \right] + \\
&+ \sum_i \sum_s \frac{t_{ijs} T_{ijs}}{X_j} \left[\frac{\Delta T_{ijs}}{T_{ijs}} - \frac{\Delta p_{is}}{p_{is}} \right].
\end{aligned} \tag{12}$$

The first term represents a traditional term-of-trade effect, which compares the changes in domestic and foreign prices. The second term represents the profit shifting effect and measures the changes in country's profits originating from the changes in its outputs. Finally, the third term represents the changes in country's tariff revenue resulted from the changes in its import volumes. This decomposition will be used in the paper for the evaluation of the effects of the trade wars.

One of the assumptions of the model is that the trade is balanced across countries: $NX_i = \sum_j \sum_s (T_{ijs} - T_{jis}) = 0$. At the same time, the trade flows between countries do not satisfy this condition. To adjust for this fact, Ossa (2014) suggests to balance the trade flows before the calculation of the response to the changes in tariffs. Particularly, Ossa (2014) suggests to put $\hat{\tau}_{ijs} = 1$ in equations (8) - (11) and augment the equation (11) with the additional term $\frac{NX_j}{X_j} \widehat{NX}_j$ where $NX'_j = 0$. The resulted system of the modified equations then should be solved for \hat{w}_i , \hat{X}_i , $\hat{\pi}_{is}$, and \hat{P}_{js} . According to Ossa (2014), the resulted changes in trade flows $\hat{T}_{ijs} = \left[\frac{\hat{w}_i}{\hat{P}_{js}} \right]^{1-\sigma_s} \hat{X}_j$ should bring the balanced trade $NX'_j = 0$.

A different approach is adopted in this study. As in Ossa (2014), $\hat{\tau}_{ijs} = 1$ is assumed in equations (8) - (10). At the same time, for the adjustment of trade flows the equation (11) is replaced by $NX'_i = \sum_j \sum_s (T'_{ijs} - T'_{jis}) = 0$, where $T'_{ijs} = \hat{T}_{ijs} T_{ijs}$ with $\hat{T}_{ijs} = \left[\frac{\hat{w}_i}{\hat{P}_{js}} \right]^{1-\sigma_s} \hat{X}_j$. This way the requirement for the balanced trade is imposed directly. The resulted condition is specified as

$$\sum_j \sum_s \left(T_{ijs} \left[\frac{\hat{w}_i}{\hat{P}_{js}} \right]^{1-\sigma_s} \hat{X}_j - T_{jis} \left[\frac{\hat{w}_j}{\hat{P}_{is}} \right]^{1-\sigma_s} \hat{X}_i \right) = 0. \tag{13}$$

To find the adjusted trade flows that lead to $NX'_i = 0$, we solve equations (8) - (10) and (13) for \hat{w}_i , \hat{X}_i , $\hat{\pi}_{is}$, and \hat{P}_{js} , assuming $\hat{\tau}_{ijs} = 1$ in the equations (8) - (10). The adjusted trade flows are calculated as $T'_{ijs} = \hat{T}_{ijs} T_{ijs}$ with $\hat{T}_{ijs} = \left[\frac{\hat{w}_i}{\hat{P}_{js}} \right]^{1-\sigma_s} \hat{X}_j$. Further, the adjusted trade flows are used to compute α_{ijs} , δ_{is} , γ_{ijs} , π_{js} , $w_j L_j$, and X_j in equations (8) - (11). Given the changes in tariffs \hat{t}_{ijs} , the equations (8) - (11) can be solved numerically for \hat{w}_i , \hat{X}_i , $\hat{\pi}_{is}$, and \hat{P}_{js} .

3 Data

Most of the data come from the seventh version of the Global Trade Analysis Project database (GTAP 7). This data base contains the industry-level trade and production data for the year 2004. The trade flows between countries, T_{ijs} $i \neq j$, are taken directly from the industry-level trade data. T_{iis} are computed by subtracting country's industry-level export from its industry-level production. The tariffs are calculated using the data on the trade flows computed at importer's market prices and the data on the trade flows computed at world prices. For the entries with close to zero trade flows, the computed tariffs have zero values. So, it is impossible to retrieve the information on tariffs from GTAP 7 for the close to zero trade flows. For these trade flows the Trade Analysis Information System (TRAINS) was used as a source for the information on tariffs. At this point, the results were obtained using the data for Meat Products Sector and Dairy Products Sector, because the derived tariffs from GTAP data base has been supplemented by the data from TRAINS data base only for these sectors.

The values of the demand elasticities has been taken from Ossa (2014). Their estimation could be done later.

Export-partners		Import-partners	
Russian Federation	108.51	Poland	14.04
USA	0.19	Lithuania	3.37
Germany	0.17	France	2.69
United Kingdom	0.13	Germany	2.40
Spain	0.09	Belgium	2.22

in millions of U.S. dollars.

Table 1: Export and import partners of Belarus in Meat Products Sector

Export-partners		Import-partners	
Russian Federation	396.84	Russian Federation	25.27
Poland	25.74	Ukraine	2.93
Germany	17.04	Germany	0.98
France	4.64	Poland	0.79
USA	4.10	Lithuania	0.48

in millions of U.S. dollars.

Table 2: Export and import partners of Belarus in Dairy Products Sector

Table (1) and Table (2) contain the information on main trade partners of Belarus. Russian Federation, Germany, and Poland are among main trade partners of Belarus. Changing the tariff in trade with these partners could have a sizable effect on country's welfare.

4 Results

As it was mentioned in Section 1, after break up of Soviet Union and before the official establishment of CIS FTA in year 2011, CIS countries de facto comprised FTA. It means that CIS countries had free trade between themselves and were free to choose the size of tariffs in trade with the other countries. Taking this into account, the optimal tariffs for Belarus from welfare point of view were estimated to be equal to 19% for Meat Products Sector and 10% for Dairy Products Sector for year 2004. The estimation was done using Ossa (2014) methodology. At the same time, according to the data, in year 2004, the average tariff applied by Belarus in Meat Products Sector was 15% and the average tariff in Dairy Products Sector was 15%. As we can see, the tariffs set by Belarus were close to the optimal ones predicted by the model. Belarus kept the tariffs at these levels till year 2010, when it became a part of Customs Union.

The optimal tariffs for Russian Federation were estimated to be equal to 30% for Meat Products Sector and 20% for Dairy Products Sector for year 2004. Since the tariffs applied by Russian Federation in year 2004 were equal to those set by Belarus, it can be stated that the tariff levels for Russian Federation were below the optimal ones. After year 2004, Russian Federation started to increase its tariff in Meat Products Sector from 15% in 2004 to 23.55% in 2009, though the tariff in Dairy Products Sector stayed unchanged at 15% till 2010.

The paper looks at the effects of the trade wars that followed 2014 events in Ukraine. Belarus, Russian Federation, and Kazakhstan were part of Customs Union in year 2014. At the same time, in year 2004 for which the data are available, Belarus, Russian Federation, and Kazakhstan were not the part of Customs Union. These countries were de facto part of FTA with the other CIS countries. To adjust for this fact, we change the tariffs for Belarus, Russian Federation, and Kazakhstan to the levels corresponding to year 2010 when EAEU CU was established. The changes in the trade flows in the response to the changes in tariffs from 2004 levels to 2010 level are evaluated using the framework by Ossa (2014). Adjusted this way tariffs and trade flows is the initial point for the estimation of trade wars' effects.

In the first subsection of this section, the outcomes of Customs Union formation are discussed. In the second subsection, the analysis of trade wars is conducted assuming that EAEU CU members continue to apply the common tariff, even though Russian Federation deviated from the common tariff and introduced the ban on imports in certain sectors. In the third subsection, the analysis of trade wars is conducted for the case when Customs Union members have the option to deviate from the common tariff during trade wars. In this case, EAEU CU de facto becomes FTA.

4.1 Transition toward Customs Union

When EAEU CU was formed in 2010, Belarus, along with Russian Federation and Kazakhstan set up a common external tariff for each sector. Specifically, the common external tariff was equal to 30% in Meat Products Sector and 16,7% in Dairy Products Sector. The pre-EAEU CU tariffs for EAEU CU members were lower than the corresponding common external tariffs. This fact is in agreement with trade theory. Another feature of Customs Union is that its members do not keep their tariff revenues to themselves, but the total tariff revenue is distributed among the members. In the case of EAEU CU, the total tariff revenue was distributed according to the schedule: Russian Federation 87,97%, Kazakhstan 7,33%, and Belarus 4,7%.

	ΔW	$\Delta \tilde{w}$	$\Delta \tilde{\pi}$	$\Delta \tilde{R}$
Belarus	-0.03%	-0.04%	0.03%	-12.02%
Russian Federation	0.02%	-0.09%	0.07%	32.08%
Kazakhstan	0.15%	-0.02%	-0.02%	800%
Ukraine	0.003%	-0.01%	0.002%	8.25%
EU countries	-0.11 ÷ 0%	-0.03 ÷ 0%	-0.09 ÷ 0%	-8.3 ÷ -0.06%

W - welfare, \tilde{w} - real wage, $\tilde{\pi}$ - real profit, \tilde{R} - real tariff revenue

Table 3: The transition from FTA to CU

According to the estimation, the results of which are in Table (3), all the members of newly formed Customs Union, but Belarus, benefited from its formation. The reason why Belarus did not benefit is that the portion of its tariff revenue in the total tariff revenue was larger than 4,7%, the portion of total revenue distributed to Belarus. So, after-distribution tariff revenue of Belarus was smaller than its before-distribution tariff revenue. 12.02% decline in tariff revenue of Belarus in transition to the common tariff in Table (3) would be replaced by 38.88% increase if in the transition to the common tariff no redistribution took place. The reason for this is that only two sectors are used in the analysis currently. For these two sectors, the total revenue collected by Kazakhstan is much smaller than what it gets after distribution. The negative effect for Belarus will likely disappear when more sectors will be included into estimation, increasing share of the tariff revenue collected by Kazakhstan in the total revenue.

Although, we observe the decrease in real wage for Customs Union members, the terms-of-trade effects for Belarus and Russian Federation are positive. While the term-of-trade effects for EU countries are negative. The welfare of EU countries also decreases. These observations are in line with classical trade theory.

4.2 Customs Union and Trade Wars

The starting point for this subsection is the tariffs and trade flows resulted from the formation of Customs Union.

The transition of Ukraine from being the part of CIS FTA to becoming the part of EU is considered. The result of this transition is that CIS FTA members introduced the tariffs on imports from Ukraine which were equal to the tariffs applied against the other countries. As the member of EU, Ukraine introduced the tariffs on imports from non-EU countries which were equal to the tariffs applied by EU members. And the tariffs in trade between Ukraine and EU were eliminated. This transition sparked the trade wars. In response to the sanctions imposed on Russian Federation, it banned the imports in Meat Products and Dairy Products Sectors from EU countries, USA, Australia, and Norway. In addition, Russian Federation and Ukraine banned the imports from each other in these sectors. Within Ossa (2014) framework, the ban on imports is modelled as 800% tariff on imports. In spite of deviation by Russian Federation from the common tariffs, the other Customs Union members continued to follow the common tariff policy. Moreover, the Customs Union members continued to participate in redistribution of tariff revenue.

	ΔW	$\Delta \tilde{w}$	$\Delta \tilde{\pi}$	$\Delta \tilde{R}$
Belarus	-0.03%	0.003%	-0.02%	-44.86%
Russian Federation	-0.49%	-0.39%	-0.09%	-46.62%
Kazakhstan	-0.14%	-0.05%	-0.07%	-42.36%
Ukraine	0.23%	0.34%	-0.62%	42.89%
EU countries	$-0.38 \div 0.08\%$	$-0.08 \div 0.06\%$	$-0.08 \div 0.23\%$	$-39.7 \div -1.72\%$

W - welfare, \tilde{w} - real wage, $\tilde{\pi}$ - real profit, \tilde{R} - real tariff revenue

Table 4: The effects of the trade wars with CU in place

According to the estimation, the transition of Ukraine from CIS FTA to EU and resulted trade wars lead to the outcomes outlined in Table (4). Right away, we can notice a substantial decrease in the welfare of Russian Federation that resulted from the introduced ban on imports. In addition to the substantial decrease in the tariff revenue because of ban on imports, the model predicts the decrease in real wages as well. This is in agreement with empirical data corresponding to the period after the trade wars. In spite of trade wars between Russian Federation and Ukraine, the model predicts the increase in the welfare of Ukraine following the association with EU. The increase in the real wage in Ukraine predicted by the model did not materialize so far, probably, because of continuing military conflict and the time needed to redirect the trade flows in response to the changes in tariffs.

The welfare of EU countries that used to export into Russian Federation decreases significantly. Particularly, the welfare of Lithuania, Latvia, Poland, and Germany goes down by 0.2% on average. Mainly, the countries that used to export to Russian Federation has been

affected negatively because of the ban imposed on their exports.

The welfare of Belarus decreases by 0.03%. The decrease mainly comes from the decrease in tariff revenue by 44.86%. The decrease in tariff revenue is the result of redistribution of the total revenue between Customs Union members.

Before-distribution tariff revenue of Russian Federation decreases by 53.5% because of introduced ban on imports. This decline transforms into the decrease in after-distribution tariff revenue of Belarus by 44.86%. Let's assume that Belarus had an opportunity to keep the collected tariff revenue to itself after the beginning of trade wars. In this case, its tariff revenue would have increased by 112% and its welfare would have increased by 0.07%, instead of decline by 0.03%.

4.3 Trade Wars and Transition to FTA

The starting point for this subsection is the tariffs and trade flows resulted from the formation of Customs Union. The tariff adjustments consists of two parts. The first part includes the adjustments that are the same as in the previous subsection. It includes the changes in tariffs corresponding to the transition of Ukraine from CIS FTA to EU. Also, this part includes the increases in tariffs associated with the trade wars. The second part includes the decrease of tariffs by CU members to FTA levels in response to the ban on imports by Russian Federation. Also, the former CU members terminate their participation in the redistribution of the total tariff revenue.

	ΔW	$\Delta \tilde{w}$	$\Delta \tilde{\pi}$	$\Delta \tilde{R}$
Belarus	0.05%	0.04%	-0.05%	47.93%
Russian Federation	-0.52%	-0.34%	-0.12%	-66.6%
Kazakhstan	-0.21%	-0.03%	-0.06%	-86.2%
Ukraine	0.23%	0.34%	-0.62%	42.4%
EU countries	-0.32 ÷ 0.09%	-0.06 ÷ 0.07%	-0.08 ÷ 0.24%	-33.6 ÷ -1.6%

W - welfare, \tilde{w} - real wage, $\tilde{\pi}$ - real profit, \tilde{R} - real tariff revenue

Table 5: The effects of the trade wars under transformation of CU into FTA

According to the estimation, the transition of Ukraine from CIS FTA to EU, trade wars, and deviation by Kazakhstan and Belarus from EAEU CU to FTA status lead to the results outlined in Table (5). Opposite to the results in the previous subsection, now welfare of Belarus increases by 0.05%. Moreover, its tariff revenue increases by 47.93%, instead of its decline by 44.86% in previous subsection. Again, the increase in tariff revenue is the result of not participating in the redistribution of tariff revenue. It can be concluded that the effects of the trade wars on Belarus are more favorable if it has the option of deviation from CU to FTA status. Also It should be pointed out that the real wage in Belarus increases by the larger amount in the case of moving to FTA status than it does in the case of keeping CU

status.

The main burden of the trade wars is on Russian Federation. It is welfare decreases by 0.52%. This decline in welfare comes from the decrease in the tariff revenue as well as in the real wage. Also, in the case of transition to FTA, the welfare of Kazakhstan is affected negatively, because of the substantial decrease in its tariff revenue. In spite of the decrease in the welfare of Russian Federation, its terms of trade evaluated according to the expression (12) increase by 0.52% as well as profit shifting equals to 0.07%. At the same time, the terms of trade for EU countries decrease, contributing to the decline in the welfare of Lithuania, Latvia, Poland, and Germany. Because of the introduced ban on imports, the prices in countries that used to export into Russian Federation decrease, leading to the decrease in the terms of trade of these countries. The decrease in prices lead to the decline in wages and welfare of Lithuania, Latvia, Poland, and Germany.

The trade wars also affect the size of the optimal tariffs for Belarus. The optimal tariffs for Belarus from welfare point of view were estimated to be equal to 19% for Meat Products Sector and 10% for Dairy Products Sector for year 2004, when Belarus had FTA status. According to the estimation, the optimal tariffs for Belarus after the transition of Ukraine to EU and followed trade wars are equal to 21% for Meat Products Sector and 11,5% for Dairy Products Sector. While keeping FTA status, the trade wars lead to the higher optimal tariffs for Belarus. The result of trade wars is the increase in trade flow through Belarus. Belarus could further benefit from the increased trade flow by increasing slightly tariffs and its tariff revenue.

5 Conclusion

The transition of Ukraine from CIS FTA to EU and followed trade wars lead to decrease in the welfare of Belarus by 0.03%. The main reason is that Belarus should share its increased tariff revenue with other CU members, whose tariff revenue decreased. As result, after redistribution tariff revenue of Belarus is by 44.86% smaller than its tariff revenue before the beginning of trade wars. While still be part of Customs Union, Belarus should argue for the increase in its share of total tariff revenue of CU from 4.7% to 8.7%. In this case, the tariff revenue of Belarus will increase by 2.06% instead of decrease by 44.86% leading to no change in the welfare of Belarus.

Another possibility for Belarus is to move from CU status to FTA status. In this case, it will not need to share its tariff revenue with other countries. As result, its after trade wars welfare will be 0.05% higher than its before trade wars welfare. Its tariff revenue will increase by 47.93% instead of decline by 44.86%. The real wage will increase by the larger amount relative to the amount when keeping CU status. Also, the study suggests that the optimal tariffs of Belarus under FTA status with trade wars are higher than the optimal tariffs under

FTA status without trade wars. The higher tariffs is the optimal response to the increased trade flow through Belarus resulted from trade wars.

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