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Policy impacts on the EU-Russian trade performance: The case of agri-food trade

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Abstract: The main goal of this paper is to provide an overview of the impact from Russian import ban on trade between the Russian Federation and the selected Western countries – especially EU members. Because of the applied ban characteristics, the European Union could be considered as the most affected subject of Russian protectionism. This paper identifies the changes affecting EU agrarian export performance in relation to the Russian Federation. Changes in the trade of vegetables, fruits, meat and animal products, dairy and dairy products and fish are identified. This paper also provides an overview of changes related to Russian trade competitiveness and territorial structure. The result of the applied import ban was a significant reduction of Russian agrarian import value – within the first three years alone, the value of imports was reduced by 7,389 million USD. The import ban also changed the overall competitiveness of Russian agricultural trade, while recognising that the comparative advantages of some commodity groups was reduced. The processed data is analysed through a set of the following instruments: self-sufficiency ratio, import dependency ratio and in the final part of the paper, the Lafay index (LFI) will be used for a brief analysis of the comparative advantages of the products included in the ban.

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1. INTRODUCTION

In 2013 to 2014, Russian-Ukrainian political confrontation resulted in an increasing tension between the Russian Federation and many Western countries. Because of Russia's aggressive policy, the USA, the EU-28, Canada, Norway, Australia and some other countries applied economic sanctions against Russia. In response to these sanctions, the Russian Federation decided to apply some retaliatory measures. Decree No. 560 may be one of the most significant responses to the applied sanctions in history. On August 6, 2014, President Putin issued the Decree "On Special Economic Measures to Protect Russia's Security". The result was an import ban applied to agricultural and foodstuff imports from Australia, Canada, Norway, the USA and the EU. In the beginning, this ban was intended for one year only; however, it was later decided that it should be extended.

Russian food import ban needs to be understood not only in the political context of retaliation for the applied sanctions and criticism from Western countries. This ban is also the result of long-run Russian food security and food independence policy (Kastakova, 2012). During the period of Russian economic transformations, the agricultural sector nearly collapsed. Russian food self-sufficiency was significantly reduced. In the period from 1991 to 2005, the volume and the value of national food production had decreased, while the value and the volume of food imports were consistently increasing. Such a development consistently increased the negative Agri-Food Trade balance (Svatos et al., 2014). The transformation period also negatively affected Russian agrarian trade commodity and territorial structure. This was particularly evident in the export commodity structure, as it became more concentrated, bulk commodities especially. On the other hand, the import profile became very heterogeneous and because of low import prices, it represented a significant barrier for Russian agricultural sector recovery (Ishchukova & Smutka, 2014). In the period before the import ban was applied, Russian government had been seeking reasons to protect its market and thus increase national food security (Erokhin et al., 2014). Sanctions from Western countries gave Russian government an excuse to apply its plans for supporting the expansion of the domestic agricultural sector. Foreign competitors were driven out of the Russian market and Russian consumers had to accept the increase in local food prices. Subsequently, reduced competition and higher consumer prices have encouraged Russian food producers increase their production performance.

The applied import ban supported the original Russian government's Doctrine of Food Security (grain – 95% self- sufficiency, sugar – 80% self-sufficiency, vegetable oil – 80% self--sufficiency, meat and meat products – 85% self-sufficiency, milk and dairy products – 90% self-sufficiency, fish products – 80% self-sufficiency, potatoes – 95% self-sufficiency, edible salt – 85% self-sufficiency) (Doctrine of Food Security of RF, 2009). The applied ban affected the imports of vegetables, fruits, animal and dairy products, and fish and fish products.

Russian agrarian import ban has been extended and changed several times since 2014: On May 27, 2016, the Russian Government issued Decree No. 472; On October 22, 2016, the Russian Government issued Decree No. 1086; On October 25, 2017, the Government of Russia issued Decree No. 1292.

2. LITERATURE REVIEW

The main goal of this paper is to identify the fundamental changes in EU-Russian mutual agricultural trade performance in the period after the Russian import ban was applied in relation to selected countries, particularly EU members. The paper has identified the primary changes in commodity and territorial structure performance. Another important goal is to identify changes in EU Agri-Food Trade comparative advantages distribution in relation to Russia as the applied ban changed characteristics of EU exports.

The processed paper is closely related to an already published paper entitled "Agrarian import ban and its impact on the Russian and European Union agrarian trade performance" (Smutka et al., 2016). While this paper reviewed the data concerning EU-Russian trade in the period of 2000-2013 and preliminary data for 2014, our paper provides a clear overview of the real import ban impact on Russian trade with affected countries. While the first article was devoted to estimations of possible impacts, this paper provides a clear overview of the changes in territorial and commodity structure related to Russian imports influenced by the applied food import ban (analysis is summarizing the impact of sanctions in period 2014-2016).

This paper is focused on providing an overview of the applied Russian import ban impact on the first set of countries (Australia, Canada, European Union, Norway, and the United States of America). Those countries' agricultural trade has been affected by the Russian import ban over the last five years (2014-2018) and it is expected that the import ban will be enforced until at least 2019. During the last few years, the list of countries and items included in the ban has increased. However, because of data availability, this paper has analysed the impact of the applied ban on original countries and changes in their agricultural trade performance. In addition, Russian territorial structure is analysed for the period 2014-2016.

3. METHODOLOGY

The primary sources of data for the analysis are the Federal Customs Service of Russia and the UN Comtrade. The data utilized in the analyses is organized according to the Harmonized Commodity Description and Coding System (HS) of the World Customs Organisation.

The most affected commodity aggregations are the following: meat and meat products, milk and dairy products, vegetable and fruit and fish. The specific list of commodities affected by applied ban is published by Russian Government authorities (GSPI, 2018) or it is available published also by USDA (2017).

The processed data is analysed through a set of the following instruments (for the possibility to compare the real impact of the import ban – the same methodology is used in the paper Smutka et al., 2016 is applied):

3.1. Self-sufficiency ratio (SSR)

The level of self-reliance for certain types of agricultural products is determined by the percentage of agricultural production to the consumption of the country.

Self-sufficiency in agricultural products reflects the extent to which domestic production in the country is able to meet the domestic consumption of the country or its regions.

In general, the algorithm for calculating the food self-sufficiency ratio can be expressed utilizing the following formula:

$$SSR = \frac{\text{Production}}{\text{Amounts of Domestic Supply}}$$

3.2. Import dependency ratio (IDR)

In the course of the analysis of the food situation of a country, an important aspect to identify is how much of the available domestic food supply has been imported, and how much comes from the country's own production.

$$IDR = \frac{\text{Imports}}{\text{Amounts of Domestic Supply}}$$

In the final part of the paper, the Lafay index (LFI) will be used for a brief analysis of the comparative advantage of products included in the ban. The index considers the difference between each item of the normalised trade balance and the overall normalised trade balance.

For a given country i, and for any given product j, the Lafay index is defined as:

$$LFI_j^i = 100\left(\frac{x_j^i - m_j^i}{x_j^i + m_j^i} - \frac{\sum_{j=1}^{N}(x_j^i - m_j^i)}{\sum_{j=1}^{N} x_j^i + m_j^i}\right)\frac{x_j^i + m_j^i}{\sum_{l=1}^{N} x_j^i + m_j^i}$$

Where x^i_j and m^i_j represent exports and imports of product j of country i, towards and from a particular region or the rest of the world, respectively, and N is the number of items. Positive values of the Lafay index indicate the existence of comparative advantages in a given item; the larger the value, the higher the degree of specialisation (Zaghini, 2003). The LFI value was calculated for the years of 2013 and 2016 at the level of individual items (HS 2 digit code) representing mutual trade performance between EU and the Russian Federation. The total Agri-Food Trade performance is considered as the base for the individual Agri-Food items trade comparative advantages calculation.

4. EMPIRICAL RESULTS AND DISCUSSION

Russian agricultural policy is interested in the growth of food self-sufficiency and independence. The Russian government implemented legislation and set up an ambitious plan to encourage increased national agricultural production performance. As it was already mentioned, some experts for Russian agriculture, trade and policy are convinced that the applied import ban is one of several instruments applied to support national production capacities and to increase national food self-sufficiency. The applied ban significantly changed the territorial as well as the commodity structure of Russian agricultural trade (especially the structure of imports).

If our interest is to get a better overview about the real impact of the applied agricultural import ban in relation to several Western countries, it is necessary to understand some basic aspects related to the role of agriculture within Russian society and the economy. First, agriculture represents a significant pillar for Russian rural area development. Nearly 25% of the Russian population is living in rural areas, and nearly 7% of the economically active population are working in the agriculture sphere. The agricultural population represents about 10-15% of the total population. Agriculture is also extremely important for the development of local infrastructure and some other externalities.

As it is demonstrated above, The Russian Federation has suffered from a significant level of import dependency, especially in the case of vegetables, fruits, meat and dairy products, and fish and crustaceans. The applied import ban is not a random one. The ban is applied exactly in relation to those commodity

items representing the weakness of the Russian agriculture and foodstuff markets. The potential to increase production capacity and performance is significant. The only problem of increasing self-sufficiency and production performance is competitiveness and limited cost efficiency. The applied ban provides the possibility to develop local production capacities and performance. There are two side effects related to the applied ban. The first effect is a political one; increasing food independence and the support of national production capacities. The second one is related to economic issues – a reduction of consumers, increasing food prices and reduction of the agrarian trade deficit. When focusing specifically on trade performance, the Russian government is interested in changing the existing imbalance between agrarian imports (12.5% of total imports) and exports (5% of total exports) in relation to total merchandise trade performance.

Table 1

Production, consumption and import dependency of the Russian Federation
For basic agricultural products, thousand tonnes

	Grain				**Vegetables**				**Fruits and berries**			
	2000	**2010**	**2013**	**2016**	**2000**	**2010**	**2013**	**2016**	**2000**	**2010**	**2013**	**2016**
Production	65.4	61.0	92.4	120.7	11,359	13,278	16,109	18,041	2,969	2,474	3,380	3,863
Private consumption	0.1	0.1	0.1	0.1	11,476	14,426	15,712	16,358	4,659	8,242	9,180	9,021
Industrial consumption	62.9	64.3	64.5	74.1	1,403	1,662	1,996	2,128	612	728	975	1,097
Consumption per capita, kg*	117	120	118	139	79	101	109	114	32	58	64	63
Import	4.7	0.4	1.5	1.0	2,273	3,158	2,817	2,321	2,640	6,780	7,201	6,517
Export	1.3	13.9	19.0	33.9	169	543	658	1,217	47	56	139	169
Self-sufficiency ratio	103%	93%	140%	160%	86%	80%	88%	87.5%	56%	27%	33%	37%
Import dependency ratio	7%	1%	2%	0.83%	17%	19%	15%	12%	50%	75%	70%	63%
Import to Export ratio	3.6	0.03	0.08	0.03	13	6	4	1.9	56	121	52	38
	Meat and meat products				**Milk and milk products**				**Fish and crustaceans, (thousand tonnes)**			
	2000	**2010**	**2013**	**2016**	**2000**	**2010**	**2013**	**2016**	**2000**	**2010**	**2013**	**2016**
Production	4,446	7,167	8,545	9,899	32,259	31,847	30,529	30,759	4,047	4,179	4,296	4,812
Private consumption	6,564	9,871	10,812	10,851	31,317	35,237	35,633	34,666	2,619	3,207	2,800	2,854
Industrial consumption	57	37	51	49	5,205	4,271	3,742	3,163	849	456	414	526
Consumption per capita, kg	45	69	75	76	213	248	249	241	17.9	21.2	22.0	23.5
Import	2,095	2,855	2,480	1,246	4,718	8,159	9,445	7,544	922	1,504	884	1,055
Export	35	97	117	236	507	460	628	645	1,513	2,019	1,509	2,234
Self-sufficiency ratio	67%	72%	79%	91%	88%	81%	77%	81%	154%	130%	133%	142%
Import dependency ratio	32%	29%	23%	11%	13%	21%	24%	19%	26%	41%	24%	19%
Import to Export ratio	60	29	21	5.28	9	18	15	11.6	0.6	0.7	0.6	0.47

The grain table represents the consumption of bread, bakery products and cereals per capita.
Source: Russian Federal State Statistics Service (2017), Faostat database (2017)

The purpose of the following analysis is to identify the impact/efficiency of the applied ban on Russian agrarian trade in relation to countries affected by the applied ban. The following tables provide an opportunity to evaluate changes in trade performance between Russia and the countries that were affected by the ban between 2013 (just one year before the ban was applied) and 2016 (third year of applied ban).

In 2016, the total value of Russian food imports decreased by 42% in relation to 2013. The value of imports of products subject to the ban decreased during the analysed period by 57%.

The impact was clearly felt in the first year of the applied ban, as mutual trade between the Russian Federation and banned countries were definitely affected. If we compare Russian import value of banned products in 2013 (9,007 million USD) to the value performance one year later (2014), it is possible to see a sizable reduction of 3,888 million USD (but ban was applied only for last five months). One year later (2015), the applied ban had already caused the reduction of imports of banned products by another 4,247 million USD (in comparison to previous year).

Table 2

The value of Russian imports of *banned products in* 2013 (before ban) - 2016 (after the ban had been applied 2014-2016), million USD

	2013	**2014**	**2015**	**2016**	**2016 to 2013**
Total agricultural products: - from all countries	43,164	39,715	26,651	25,031	-18,133
- from countries under sanctions	18,881	14,429	6,491	6,283	-12,598
Banned products from:					
- all countries	23,135	20,31	11,287	10,035	-13,100
- countries under sanctions	9,007	5,119	872.508	742.337	-8,264
Including					
EU	6525	3481	812.908	683.402	-5841,598
AUSTRALIA	182	103	0.351	0.004	-181,996
CANADA	373	394	0.831	0.387	-372,613
NORWAY	1146	582	0.757	0.147	-1145,853
UNITED STATES	781	559	57.661	58.397	-722,603

Source: Federal Customs Service of Russia (2016), UN Comtrade 2017

In 2016, imports of banned products from the affected countries barely reached 742 million USD. That means that the applied ban reduced mutual trade between Russia on one side and EU, Australia, Canada, Norway, USA on the opposite side by nearly 92% (for more details see Tables 2, 3, 4, 5).

Table 3

Product groups affected by import ban in 2013

	EU		Australia		Canada		Norway		USA		**Total**	
	million USD	%	million USD	%	million USD	%	million USD	%	million USD	%	**million USD**	**%**
02 – Meat	1,548	24%	130	72%	247	66%	0	0%	357	46%	**2,282**	**25%**
03 – Fish	216	3%	1	1%	119	32%	1,142	100%	76	10%	**1,554**	**17%**
04 – Milk	1,738	27%	44	24%	0	0%	4	0%	0	0%	**1,787**	**20%**
07 – Vegetables	935	14%	0	0%	3	1%	0	0%	8	1%	**946**	**11%**
08 – Fruits	1,519	23%	7	4%	2	1%	0	0%	231	30%	**1,759**	**20%**
16, 19, 21 - Food prep.	568	9%	0	0%	2	1%	0	0%	108	14%	**679**	**8%**
Total	**6,525**	**100%**	**182**	**100 %**	**373**	**100 %**	**1146**	**100%**	**781**	**100%**	**9,007**	**100 %**

Source: Federal Customs Service of Russia (2015)

As a consequence of the sanctions being applied, the share of the banned countries' food products as a share of the total Russian food imports steadily declined. In the period of 2014 to 2016, their share

reduced from cc 44% to cc 25%. The most affected subject of applied sanctions was the European Union. In the period before the sanctions, the EU's share of Russian imports of subsequently banned food products was nearly 15%, while in 2016 it was only 2.73% (for details see Table 4) (exports to Russia reduced by 5.8 billion USD). Sanctions also significantly affected countries such as Norway (exports to Russia reduced by 1.1 billion USD). Table 5 provides an overview of the trade exports of product groups affected by the Russian import ban at the level of individually affected countries. If we compare the situation in 2013 (Table 3) to that in 2016, it is clear to that there were decreases across the board. These decreases are highlighted below.

The value of meat exports was reduced from 2.282 billion USD to 536 million USD, the value of fish exports was reduced from 1.55 billion USD to 64 million USD, the value of milk and milk product exports was reduced from 1.78 billion USD to 4.3 million USD, the value of vegetable exports was reduced from 946 million USD to 59 million USD, the value of fruit exports was reduced from 1.76 billion USD to 70 million USD, and the value of food preparations exported was reduced from 679 million USD to 487 million USD. Based on the data presented below, the countries of the European Union can be considered as the primary loser of the applied Russian import ban policy.

Table 4

The share of banned products in the Russian agricultural import market from 2013-2016

	2013	2014	2015	2016
Total agricultural products: - from all countries	100%	100%	100%	100%
- from countries under sanctions	43,74%	36,33%	24,36%	25,10%
Banned products from:				
- all countries	53,60%	51,14%	42,35%	40,09%
- countries under sanctions	20,87%	12,89%	3,27%	2,97%
Including				
EU	15,12%	8,76%	3,05%	2,73%
AUSTRALIA	0,42%	0,26%	0,00%	0,00%
CANADA	0,86%	0,99%	0,00%	0,00%
NORWAY	2,65%	1,47%	0,00%	0,00%
UNITED STATES	1,81%	1,41%	0,22%	0,23%

Source: Federal Customs Service of Russia (2017)

Table 5

The product groups affected by import ban in 2016

	EU		Australia		Canada		Norway		USA		**Total**	
	million USD	%	million USD	%	million USD	%	million USD	%	million USD	%	**million USD**	**%**
02 – Meat	0,504	0%	0	0%	0	0%	0,0325	24%	0	0%	**0,536**	**0%**
03 – Fish	63,904	9%	0	0%	0	0%	0,0042	3%	0,1278	5%	**64,036**	**9%**
04 – Milk	3,307	0%	0	0%	0	0%	0,0183	14%	0,9786	40%	**4,304**	**1%**
07 – Vegetables	58,608	9%	0	0%	0,195	50%	0,0084	6%	0,3959	16%	**59,208**	**9%**
08 – Fruits	69,666	10%	0	0%	0	0%	0,0018	1%	0,7268	30%	**70,394**	**10%**
16, 19, 21 - Food prep.	487,412	71%	0,0039	100%	0,192	50%	0,0676	51%	0,2239	9%	**487,899**	**71%**
Total	**683,402**	**100%**	**0,0039**	**100%**	**0,387**	**100%**	**0,1329**	**100%**	**2,4532**	**100%**	**686,379**	**100%**

Source: Federal Customs Service of Russia (2016), UN Comtrade 2017

As a result of the import ban, the share of selected countries in Russian agrarian imports of products under the ban had decreased (2013 vs. 2016). The applied import ban had already affected individual

countries in 2014 (the first year of sanctions). In 2014 alone, the share of the EU in Russian imports affected by the ban had decreased from 28% to 17%, and the share of Norway had decreased from 5% to 3%. During 2015 and 2016 the share of individual countries affected by the ban in Russian imports of products had decreased by even more. In 2016 the share of the EU had only reached 6.8%, the share of Norway had decreased to 0.001%, the share of Canada had only reached 0.003%, the share of the USA had decreased to 0.58%, and the share of Australia had decreased to only 0.0001%. On the other hand, the trade performance of some other countries had increased (for details see Table 6).

Table 6

Top 20 countries of exports to Russia (products under the applied import ban)

	Import 2013 (in USD)	Import in 2013 in kg	Import 2016 (in USD)	Import in 2016 in kg	Difference 2013/2016 (import value in USD)	Difference 2013/2016 (import volume in kg)
Serbia	140,151,272	141,260,912	263,845,505	306,651,817	123,694,233	165,390,905
China	906,933,648	823,070,642	1,029,074,545	834,457,330	122,140,897	11,386,688
Azerbaijan	210,164,498	264,646,961	293,812,717	185,825,428	83,648,219	-78,821,533
Ecuador	578,895,774	1,319,345,286	604,949,302	1,364,297,209	26,053,528	44,951,923
Kyrgyzstan	6,231,010	7,464,384	31,816,165	28,730,568	25,585,155	21,266,184
India	100,242,147	105,663,692	125,291,689	73,094,017	25,049,542	-32,569,675
TFYR of Macedonia	7,523,685	9,459,356	28,757,408	47,483,853	21,233,723	38,024,497
Georgia	8,050,198	12,325,376	25,614,581	31,729,376	17,564,383	19,404,000
Bosnia Herzegovina	821,112	889,485	16,231,722	19,196,155	15,410,610	18,306,670
Malaysia	11,568,335	4,999,329	20,185,274	13,039,233	8,616,939	8,039,904
Colombia	5,943,004	14,205,402	13,837,660	5,412,764	7,894,656	-8,792,638
Costa Rica	16,026,796	36,539,868	22,309,011	41,763,671	6,282,215	5,223,803
Mexico	2,669,082	6,522,916	8,107,905	9,091,680	5,438,823	2,568,764
Armenia	68,532,134	48,667,552	73,726,309	99,987,899	5,194,175	51,320,347
Albania	499,860	670,885	3,363,873	1,124,998	2,864,013	454,113
Algeria	3,450,975	2,707,554	5,620,590	5,074,847	2,169,615	2,367,293
Sri Lanka	472,727	58,034	1,712,198	122,876	1,239,471	64,842
Mongolia	394,623	2,455,988	1,404,560	572,400	1,009,937	-1,883,588
Mozambique	13,181	58,615	497,075	35,723,502	483,894	35,664,887
Jordan	2,791,908	2,313,782	3,126,356	2,569,516	334,448	255,734

Source: UN Comtrade 2017.

The impact of the applied ban on EU's exports to Russian Federation

The subsequent part of this paper provides an overview of the applied import ban on EU agricultural exports. The European Union is considered the most affected region by the applied ban. The EU export of banned items was reduced from 6.5 billion USD to less than 700 million USD. The tables 7-11 provide an overview the impact of the applied ban on EU vegetable, fruit, dairy and dairy products, meat and meat products and fish exports (see Appendix).

Between 2013 and 2016, the total value of EU exports of vegetables to Russia decreased by 94% in terms of value, and by 95% in terms of quantity. The most affected products were tomatoes (decreased by 199 thousand tonnes), cabbage (decreased by 118 thousand tonnes), carrots (decreased by 91 thousand tonnes), and potatoes (decreased by 80 thousand tonnes). The most affected countries of the applied ban are the following: the Netherlands, Spain, Poland and Belgium. On the other hand, the winners of the applied ban are China, Turkey, Belarus, and Egypt. These countries managed to replace European exports to Russia. This is especially true in the case of tropical and subtropical production. It means the applied ban not only reduced EU's exports of its own production, but it also affected re-exports.

In the first place, the Russian ban affected the perishable products/fruit sector. For several EU countries, Russia was traditionally an important destination for EU fruit. Russia represented about 30% of the EU's fruit exports in 2013. The main products concerned were apples, peaches, nectarines and pears. The main EU suppliers of fruits were Poland, Spain, Greece, Italy and Belgium. In the period 2013-2016, European fruit export was reduced from 1,519 million USD to nearly 70 million USD. The value of exports was reduced by 95% and export volume was reduced by 97% (from 1538 to 40 tons). Countries that were most affected by the ban were the following: the Netherlands, Spain, Italy, Poland and Germany. Belarus and Serbia took advantage of not being involved in the trade war and they are re-trading food products between EU and Russia.

Other EU exports that were significantly affected by the Russian import ban are represented by Meat and meat products. The volume and value of exported meat were reduced by nearly 100%. The value of exports was reduced from 1,548 million USD to only 0.5 million USD and the volume was cut from 472 thousand tonnes to 98 tonnes. The import ban affected trade in all kinds of meat. This significant export reduction particularly affected the trade in pig meat and the trade in poultry meat. The pork meat trade was reduced from 1,548 million USD to 0.5 million USD. The poultry meat trade was reduced from 95 million USD to 32 ths. USD. To compensate for missing imports from the EU, Russia increased imports of meat from Brazil, Belarus, Turkey, Argentina, and Serbia. In addition, the significant part of those imports is represented by re-exports originating from EU countries. Because of constantly increasing re-exports from Serbia and Belarus, Russia decided to change its attitude towards bilateral trade agreements.

The ban applied to fish imports did not affect EU trade performance so much as bans applied to other commodity imports. In the period from 2013 to 2016, the value of EU exports was reduced from 216 million USD to cc 64 million USD. Trade volume was reduced from cc115 thous. tons to cc 24 thous. tons. While in the case of other types of commodities, the EU may be considered the most affected subject of the applied import ban. In the case of the fish trade, the most affected country, Norway, is not an EU member.

The applied Russian import ban significantly hurt one of the weakest sectors of the EU agricultural and foodstuff industry – the dairy sector. The EU dairy market is suffering because of chronic problems related to its instability due to production imbalances. Making matters worse, is that just before the ban was applied, EU countries were in the process of a dairy market transformation. Between 2013 and 2016, the applied ban reduced EU dairy exports to Russia from 1,738 million USD/year to cc 3 million USD/year. The exported volume was reduced from 417 thous. tons to only 620 tons. The most affected segments of the dairy trade are the following: cheese and curd (export value reduction by 1,272 million USD), butter and milk fats (within an analysed time period – the export value was reduced from 184 million USD to less than 100 this. USD. Countries suffering due to the applied ban are Russia's neighbours to the west; Finland, Poland and the Baltic countries. Because of the low level of Russian dairy production performance and its inability to satisfy domestic demand, Russia substituted EU products by imports from the following countries: Argentina, Belarus, and Kazakhstan (Exports from some countries are not represented by their own production, but it is only a re-export. It is evident especially in the case of Belarus).

Table 7 provides an estimation-overview of the expected impact of the applied ban on EU agricultural trade. The processed table (processed table doesn't exist-should be analysed) provides an estimation of differences between the theoretical value of trade performance (based on trade development in the period before the ban was applied) and the current trade performance (2016).

Table 7

The estimated real impact of the applied ban on European agricultural exports

	2010	2011	2012	2013	2014	2015	2016	Losses (2016 to 2013)		AVG growth rate 2010-2013	Expected value of imports in 2016	Losses to expected imports	
								million USD	%			million USD	%
02 – Meat	1355	1521	1382	1563	237	15	13	-1550	-99%	5%	1816.92	-1804	-99%
03 – Fish	281	244	207	204	129	48	64	-140	-69%	-10%	149.04	-85	-57%
04 – Milk	1496	1458	1491	1790	1009	233	170	-1620	-91%	7%	2184.47	-2014	-92%
07 – Vegetables	781	1009	845	968	631	75	59	-909	-94%	9%	1254.63	-1196	-95%
08 – Fruits	1282	1534	1687	1671	1016	106	72	-1599	-96%	10%	2215.51	-2143	-97%
16 19 21 - Food prep.	528	634	710	865	460	1139	1051	186	21%	18%	1420.25	-369	-26%
Total	5723	6399	6322	7061	3481	1617	1429	-5632	-80%	7%	8684,00	-7255	-84%

Source: Comtrade database Federal Customs Service of Russia (2017)

Table 8

The non-affected part of EU agrarian exports to the Russian Federation

HS system	2010	2011	2012	2013	2014	2015	2016	Losses (2016 to 2013)	
								Million USD	%
01 – Live animals	245	321	207	114	141	121	116	2	2%
05 – Animal originated products	52	57	52	47	28	21	23	-24	-51%
06 – Cut flowers	447	551	593	630	544	456	398	-232	-37%
09 – Coffee, tea, mate, spices	146	184	184	227	235	178	230	3	1%
10 – Cereals	88	211	150	214	206	135	101	-113	-53%
11 – Products of milling industry	73	103	112	98	108	72	88	-10	-10%
12 – Oil seeds	266	385	406	425	355	293	376	-49	-11%
13 – Lack, gums, resins	101	102	91	100	97	83	88	-12	-12%
14 – Vegetable planting materials	0	1	1	0	0	0	1	0	48%
15 – Animal and vegetable fats & oils	300	393	350	325	379	211	257	-68	-21%
17 – Sugars and sugar confectionery	142	128	156	159	162	122	131	-28	-18%
18 – Cocoa and cocoa preparations	493	562	531	556	601	418	573	17	3%
20 – Preparations of vegetables, fruit and nuts	481	529	562	595	644	420	440	-155	-26%
22 – Beverages and spirits	1 265	1 681	1 888	2 068	1 878	1 062	995	-1 073	-52%
23 – Food industry waste and prepared animal fodder	621	729	718	752	728	529	525	-228	-30%
24 – Tobacco and manufactured tobacco substitutes	179	188	187	186	232	260	398	212	114%
Total	4 899	6 125	6 186	6 495	6 339	4 379	4 738	-1 757	-27%

Source: Comtrade database Federal Customs Service of Russia (2017)

As can be seen from the calculations, in recent years there has been an upward trend of growth in imports of agricultural products in almost all commodity groups (except for fish and crustaceans). On average, imports grew by 7% per year. Therefore, if Russia had not taken the decision to apply an import ban on products from the EU, the value of food exports could have increased to 8,684 million USD. Thus, taking into account the benefits, the reduction in import value amounted to 7,255 million USD. It is necessary, however, to highlight the impact of the Russian policy on that part of agricultural trade not on the import ban list. The value of EU exports in items not included in the import ban list was reduced from 6,495 million USD in 2013 to 4,738 million USD in 2016 (by 27%). The most affected exports items (not listed in the import ban) are the following: beverages and spirits, food industry residues and waste, animal fodder, preparations of vegetables and fruit and nuts, cut flowers and cereals.

The final part of this paper is dedicated to Russian agricultural trade competitiveness analyses. The table available in appendix (Appendix Table A1), provides an overview of LFI index analyses between 2013 (before applied import ban) and 2016 (the third year of applied ban). This table details the basic changes in the LFI index for approximately forty-eight commodity items representing trade in agricultural and foodstuff products under the applied import ban.

The following items dispose by comparative advantages according to LFI analysis:

0303 - fish frozen	(LFI = 10.59)
0306 - crustaceans live fresh etc. and cooked	(LFI = 7.91)
0304 - fish fillets & other fish meat	(LFI = 3.48)
0713 - leguminous vegetables dried shelled	(LFI = 3.15)
0307 - molluscs & aquatic invertebrates	(LFI = 0.72)
0401 - milk and cream, not conc. or sweetened	(LFI = 0.52)
0305 - fish dried salted etc. smoked etc.	(LFI = 0.46)
0802 - nuts nes	(LFI = 0.20)
0709 - vegetables nes	(LFI = 0.17)
1601 - sausages similar prdt meat	(LFI = 0.11)
0403 - buttermilk yogurt kefir etc.	(LFI =0.09)
0710 - vegetables (raw or cooked by steam)	(LFI = 0.04)
0711 - vegetables, temporarily preserved	(LFI = 0.01)
0807 - melons and papayas	(LFI = 0.01)

During the analysed years, agricultural exports improved their comparative advantages in the case of sixteen commodity items. About thirty items recorded the reduction of comparative advantages. Items increasing their comparative advantages are the following: 0306 - crustaceans live fresh, 0304 - fish fillets & other fish meat, 0713 - leguminous vegetables, dried shelled, 0302 - fish, fresh or chilled, 0307 - molluscs & aquatic invertebrates, 0802 - nuts, 0709 – vegetables and 0401 - milk and cream, not conc.(maybe not concentrated) or sweetened. Conversely, the most significant comparative advantages reduction was recorded in the case of the following items: 0303 - fish, frozen, 0805 - citrus fruit, 0402 - milk and cream, conc. or sweetened, 0803 - Bananas and plantains, 0405 - butter and other milk fats and oils, 0406 - cheese and curd, 0201 - meat of bovine animals, fresh or chilled, 0202 - meat of bovine animals, frozen, 0808 - apples, pears and quinces, 0403 - buttermilk, yogurt, kefir etc., 0401 - milk and cream, not conc. or sweetened. While the applied import ban improved Russian trade competitiveness, especially in the area of fish trade; in the case of meat, dairy products, fruits and vegetables, the applied ban was not able to improve comparative advantages. However, Russia has improved competitiveness not only at the level of Russian national market but also at the level of post-soviet countries (Community of the Independent States and Eurasian Economic Union) as a result of the applied ban.

4. EMPIRICAL RESULTS AND DISCUSSION

The import ban is a political and economic sanction that is contradictory to the principles of free trade. From the perspective economic theory, economic sanctions provide for suboptimal resource allocation and create welfare loss in aggregate. The import embargo has redistributional effects on both the sanctioning and target countries (Kaempfer & Lowenberg, 2007). The primary finding is that Russia bears the highest income loss, while the EU recovers part of its lost trade through the expansion of exports to other markets (Boulanger et al., 2016). Economic theory also considers households' behavioural aspects by finding an answer to the question of whether commercialized households could make a greater contribution to national food security in Russia (Wegren, 2015).

Economic recession and restrictions on foreign trade in food caused increasing vulnerability of Russian households to food insecurity. A regression-based analysis revealed that sustainability of the food supply in Russia is threatened by inflation and a decreasing purchasing power. People are shifting towards purchasing cheaper products of lower quality, while exporters seek higher profits outside the country and thus create food shortages in the domestic market (Erokhin, 2017). The Russian Federation faces a new economic crisis associated with the termination of public investments. Thus, the most promising new strategy to overcome the crisis could be an increase in food products (exports) to Asian and African countries (Koptseva & Kirko, 2017).

One of the key impacts of the sanctions on food products supply and agricultural policy in Russia was the dynamic growth of prices on the importation of banned food products in the internal Russian market compared to the inflation rate. To cover the food shortage, Russia started or expanded collaboration with other international partners, e.g. Brazil, Belorussia, Paraguay, Argentina and Iran (meat), Ecuador, Pakistan, Morocco, China (fruit), Egypt, the Republic of South Africa, Israel, Azerbaijan (vegetables) etc. (Kapsdorferová & Sviridova, 2016).

The import ban has also had an impact on Russian agricultural policy in the form of increased federal expenditures on the realisation of the agricultural development programme until 2020. The aim of the agricultural development programme is to support successful agricultural enterprises in an attempt to establish an internal market of Russian agricultural raw materials and food products by 2020 and to expand to external markets with high-quality natural products (Kapsdorferová & Sviridova, 2016).

There are many effects of the Russian agrarian import ban from the perspective of the EU. Russia was the second most important destination for EU Agri-Food sector exports, after the USA. The economic literature shows that the effectiveness of an import ban can be doubtful, as the target country may redirect exports to third countries and/or also engage in triangular activities to bypass custom controls (Drezner, 2000; Kutlina-Dimitrova, 2017). Agrarian foreign trade statistics show that the export of banned agricultural products has been redirected towards new markets. Moreover, the European Commission started to extend support measures for the dairy, fruit and vegetable sectors affected by Russia's ban and has managed to compensate the losses in export sales to Russia by increasing exports to other main destinations and alternative markets, such as the USA, China, Switzerland, key Asian and Arabic markets (Kapsdorferová & Sviridova, 2016). The impact of the Russian import ban is country-specific, as was empirically studied e.g. in Hungary (Ságі & Nikulin, 2017), Poland (Goliński et al., 2016) or Lithuania (Stankaitytė, 2016). Nevertheless, the overall impact on GDP is marginal (Mo, 2016).

5. CONCLUSION

The Agrarian and foodstuff products import ban applied by the Russian Federation in relation to the USA, Canada, Norway, Australia and especially the European Union, significantly changed the characteristics of mutual trade in agricultural products. The value of agricultural imports from the affected countries was reduced by 66% (between 2013 and 2016). This significant import reduction not only affected imports coming from countries under the ban, but also imports from other countries recorded a reduction by 22%. The applied ban could be understood as part of a broader strategy to reduce Russian food dependency on imports of agricultural and foodstuff products. It is evident that the applied ban and other Russian governmental related activities are changing the Russian agricultural market structure and making Russia stronger and more independent. This is especially true in those products which could be produced in a local climate condition. The applied ban especially affected those imports which could be considered competitors for national production capacities (meat and meat products; dairy and dairy products; fruit and vegetable; fish). The potential to substitute those items by local production is evident. The applied ban reduced imports not only from affected countries but also from the rest of the world by 35%. Of course, imports coming from countries operating under the ban were affected much more in

comparison to others, but regardless, the applied Russian policy affected the whole import structure. This means that the Russian applied policy not only affected the importation of banned items, but also affected trade in other items and it reduced Russian food dependency on the European Union and other countries. This may be considered as evidence of a broader Russian strategy to support its own Agri-Food production capacities and food self-sufficiency.

The most affected region of the Russian import ban is undoubtedly the European Union. The applied ban affected imports especially from Lithuania, Germany, the Netherlands, Denmark, Spain, Belgium, Finland and France. The most affected countries, in relation to the share of Russian imports in their trade performance, the most affected countries are Lithuania, Latvia, Estonia, Finland and Poland.

Even though the Russian Federation was able to substitute a significant portion of reduced imports by domestic production; it was not able to substitute the full volume of banned imports. The applied ban resulted in changes in Russian agricultural trade territorial structure. To satisfy domestic demand, Russia increased food imports especially from Serbia, China, Azerbaijan, Ecuador, Kyrgyzstan, India, Macedonia, Georgia, Bosnia and Malaysia. A negative feature of the applied ban for Russian consumers was the reduction of food heterogeneity, the increase in food prices, and the reduction of competitiveness and available food quality reduction.

Because the Russian import ban was applied in the year 2017 and it is expected to be applied until at least the end of the year 2019, it is possible to expect an even more significant EU-Russian agricultural trade reduction and changes in the territorial and commodity structure. For the European, Union-Russian market is already not as attractive as it was in the past and many EU countries have decided to change their trade policies in relation to Russia.

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APPENDIX

Table A1

EU vegetable exports to Russia

	Value, in millions of USD				Quantity, thousand tonnes			
	2013	2016	2014 to 2016		2013	2016	2014 to 2016	
			million USD	%			thousand tonnes	%
EU exports of banned vegetables to Russia	935	58.61	-876.39	-94%	905	46.89	-858.11	-95%
0701 - potatoes	50	8.16	-41.84	-84%	92	11.48	-80.52	-88%
0702 – tomatoes	292	21.54	-270.46	-93%	211	11.69	-199.31	-94%
0703 - onions, shallots, garlic, leeks	56	15.87	-40.13	-72%	86	18.01	-67.99	-79%
0704 - cabbages, cauliflower, kale	85	0.03	-84.97	-100%	118	0.04	-117.96	-100%
0705 - lettuce and chicory	47	0.06	-46.94	-100%	33	0.08	-32.92	-100%
0706 - carrots, turnips & other edible roots	51	0.07	-50.93	-100%	91	0.08	-90.92	-100%
0707 - cucumbers and gherkins	57	0.06	-56.94	-100%	35	0.06	-34.94	-100%
0708 - leguminous vegetables, fr or chill	0.04	0.36	0.32	811%	0.02	0.09	0.07	340%
0709 - vegetables nesoi	205	3.02	-201.98	-99%	121	1.55	-119.45	-99%
0710 - vegetables (raw or cooked by steam)	77	0.07	-76.93	-100%	111	0.04	-110.96	-100%
0711 - vegetables, temporarily preserved	0	0.03	0.03	x	0	0.02	0.02	x
0712 - vegetables, dried, whole, cut	9.2	4.75	-4.45	-48%	2.8	0.45	-2.35	-84%
0713 - leguminous vegetables, dried shelled	5.4	4.59	-0.81	-15%	3.5	3.32	-0.18	-5%

Source: Federal Customs Service of Russia (2017)

Table A2

Test Fruits exported from the countries of the European Union to Russia

	Value, in millions of USD				Quantity, thousand tonnes			
	2013	2016	2016 to 2013		2013	2016	2016 to 2013	
			million USD	%			thousand tonnes	%
EU exports of banned fruits to Russia	1519	69.67	-1449.33	-95%	1538	39.75	-1498.25	-97%
0801 - coconuts brazil nuts & cashew nuts	0.23	0.00	-0.23	-100%	0.02	0.00	-0.02	-100%
0802 - nuts nesoi	5.43	4.49	-0.94	-17%	0.69	0.44	-0.25	-36%
0803 - Bananas and plantains	0.06	0.10	0.04	68%	0.01	0.02	0.01	139%
0804 - dates figs pineapples avocados	2.55	21.02	18.47	724%	0.5	10.63	10.13	2025%
0805 - citrus fruit	147	14.19	-132.81	-90%	134	12.01	-121.99	-91%
0806 – grapes	61	6.36	-54.64	-90%	33	2.97	-30.03	-91%
0807 - melons and papayas	2.9	3.04	0.14	5%	2.5	2.55	0.05	2%
0808 - apples pears and quinces	706	4.15	-701.85	-99%	984	5.04	-978.96	-99%
0809 - apricots cherries peaches plums	327	3.91	-323.09	-99%	217	1.72	-215.28	-99%
0810 - fruit nesoi	224	11.13	-212.87	-95%	118	4.03	-113.97	-97%
0811 - fruit & nuts (raw or cooked by steam)	34	0.38	-33.62	x	47	0.19	-46.81	x
0812 - fruit & nuts temporarily preserved	0.1	0.00	-0.10	-100%	0.2	0.00	-0.20	-100%
0813 - fruit dried nesoi	8.6	0.90	-7.70	-90%	0.8	0.15	-0.65	-81%

Source: Federal Customs Service of Russia (2017)

Table A3

Meat exports from the countries of the European Union to Russia

	Value in millions of USD				Quantity thousand tonnes			
	2013	2016	2016 to 2013		2013	2016	2016 to 2013	
			million USD	%			thousand tonnes	%
EU exports of banned meat to Russia	1548	0.504	-1547.50	-100%	472	0.098	-471.90	-100%
0201 - meat of bovine animals fresh or chilled	68	0.004	-68.00	-100%	14	0.000	-14.00	-100%
0202 - meat of bovine animals frozen	77	0.052	-76.95	-100%	18	0.021	-17.98	-100%
0203 - meat of swine (pork)	1305	0.140	-1304.86	-100%	365	0.015	-364.98	-100%
0207 - meat & ed offal of poultry	95	0.032	-94.97	-100%	72	0.050	-71.95	-100%
0210 - meat & ed offal salted dried	3.6	0.276	-3.32	-92%	0.6	0.012	-0.59	-98%

Source: Federal Customs Service of Russia (2017)

Table A4

Fish exports from the countries of the European Union to Russia

	Value in millions of USD				Quantity thousand tonnes			
	2013	2016	2016 to 2013		2013	2016	2016 to 2013	
			million USD	%			thousand tonnes	%
EU exports of banned fish to Russia	216.10	63.90	-152.20	-70%	114.70	23.69	-91.01	-79%
0301 - fish live	1.70	1.97	0.27	16%	0.10	0.07	-0.03	-28%
0302 - fish fresh or chilled	35.80	0.04	-35.76	-100%	5.50	0.00	-5.50	-100%
0303 - fish frozen	129.70	19.16	-110.54	-85%	99.90	14.03	-85.87	-86%
0304 - fish fillets & other fish meat	6.80	4.96	-1.84	-27%	1.70	2.28	0.58	34%
0305 - fish dried salted etc, smoked etc,	1.20	0.01	-1.19	-99%	0.10	0.00	-0.10	-100%
0306 - crustaceans live fresh etc, and cooked	29.80	37.66	7.86	26%	6.30	7.30	1.00	16%
0307 - molluscs & aquatic invertebrates	11.00	0.10	-10.90	-99%	1.10	0.01	-1.09	-100%

Source: Comtrade database Federal Customs Service of Russia (2017).

Table A5

Dairy product exports from the countries of the European Union to Russia

	Value in millions of USD				Quantity thousand tonnes			
	2013	2016	2016 to 2013		2013	2016	2016 to 2013	
			million USD	%			thousand tonnes	%
EU exports of banned milk products to Russia	1738	3.31	-1734.69	-100%	417	0.62	-416.38	-100%
0401 - milk and cream not conc, or sweetened	73	0.10	-72.90	-100%	41	0.11	-40.89	-100%
0402 - milk and cream conc, or sweetened	98	0.44	-97.56	-100%	25	0.13	-24.87	-99%
0403 - buttermilk yogurt kefir etc	65	0.06	-64.94	-100%	31	0.01	-30.99	-100%
0404 - whey & milk products nesoi	43	0.44	-42.56	-99%	24	0.17	-23.83	-99%
0405 - butter and other fats and oils derived from milk	184	0.01	-183.99	-100%	35	0.00	-35.00	-100%
0406 - cheese and curd	1275	2.26	-1272.74	-100%	262	0.20	-261.80	-100%

Source: Federal Customs Service of Russia (2017)

Table A6

Test Changes in EU LFI index value performance in relation to Russia

Commodity group	LFI 2013	LFI 2016	Changes 2013/2016
0303 - fish, frozen	12.3800	10.5966	-1.7834
0306 - crustaceans, live, fresh etc., and cooked	1.8700	7.9125	6.0425
0304 - fish fillets & other fish meat	1.4700	3.4868	2.0168
0713 - leguminous vegetables, dried shelled	1.1500	3.1539	2.0039
0307 - molluscs & aquatic invertebrates	0.0600	0.7198	0.6598
0401 - milk and cream, not conc. or sweetened	0.1300	0.5233	0.3933
0305 - fish, dried, salted etc., smoked etc.	0.1500	0.4666	0.3166
0802 - nuts nesoi	-0.2900	0.2014	0.4914
0709 - vegetables nesoi	-0.2800	0.1699	0.4499
1601 - sausages, similar prdt meat	0.4400	0.1066	-0.3334
0403 - buttermilk, yogurt, kefir etc.	0.5900	0.0930	-0.4970
0710 - vegetables (raw or cooked by steam)	-0.0800	0.0425	0.1225
0711 - vegetables, temporarily preserved	0.0200	0.0139	-0.0061
0807 - melons and papayas	-0.0100	0.0127	0.0227
0801 - coconuts, brazil nuts & cashew nuts	-0.0900	0.0000	0.0900
0812 - fruit & nuts temporarily preserved	0.0000	0.0000	0.0000
0708 - leguminous vegetables, fr or chill	0.0200	-0.0020	-0.0220
0210 - meat & ed offal salted, dried	0.0000	-0.0031	-0.0031
0301 - fish, live	-0.0100	-0.0226	-0.0126
0705 - lettuce and chicory	-0.0500	-0.0439	0.0061
0811 - fruit & nuts (raw or cooked by steam)	0.1200	-0.0592	-0.1792
0704 - cabbages, cauliflower, kale	-0.1300	-0.0992	0.0308
0302 - fish, fresh or chilled	-0.9900	-0.1202	0.8698
0813 - fruit dried nesoi	-0.1100	-0.1405	-0.0305
0712 - vegetables, dried, whole, cut	-0.0300	-0.1822	-0.1522
0701 - potatoes	-0.1700	-0.2166	-0.0466
0404 - whey & milk products nesoi,	-0.0900	-0.2193	-0.1293
0707 - cucumbers and gherkins	-0.3000	-0.2484	0.0516
0804 - dates, figs, pineapples, avocados	-0.1500	-0.2963	-0.1463
0706 - carrots, turnips & other edible roots	-0.1900	-0.3064	-0.1164
0703 - onions, shallots, garlic, leeks	-0.2100	-0.4200	-0.2100
0401 - milk and cream, not conc. or sweetened	-0.1200	-0.5120	-0.3920
0806 – grapes	-0.5800	-0.5735	0.0065
2106- fruit dried	-0.0800	-0.6412	-0.5612
0810 - fruit nesoi	-0.6100	-0.6872	-0.0772
1901 - fruit dried nesoi	-0.0400	-0.7221	-0.6821
0809 - apricots, cherries, peaches, plums	-0.6400	-0.7234	-0.0834
0207 - meat & ed offal of poultry	-0.4700	-0.8537	-0.3837
0201 - meat of bovine animals, fresh or chilled	-0.4300	-1.1800	-0.7500
0702 – tomatoes	-1.1400	-1.2991	-0.1591
0405 - butter and other milk fats and oils	-0.6500	-1.5679	-0.9179
0402 - milk and cream, conc. or sweetened	-0.4200	-1.7817	-1.3617
0808 - apples, pears and quinces	-1.2100	-1.8515	-0.6415
0203 - meat of swine (pork)	-2.1900	-1.8548	0.3352
0803 - Bananas and plantains	-0.8000	-1.9527	-1.1527
0406 - cheese and curd	-1.6700	-2.5220	-0.8520
0202 - meat of bovine animals, frozen	-2.4800	-3.1538	-0.6738
0805 - citrus fruit	-1.7000	-3.2429	-1.5429

Source: Comtrade database and own processing (2017)